Strengthening the Role of Ministries of Finance in Driving Climate Action

A Framework and Guide for Ministers and Ministries of Finance

FINAL REPORT | JUNE 2023

The Coalition of Finance Ministers for Climate Action

The Coalition of Finance Ministers for Climate Action

The Coalition of Finance Ministers for Climate Action brings together fiscal and economic policymakers from more than 80 countries in leading the global climate response and in securing a just transition toward low-carbon, resilient development. All members of the Coalition have signed up to the six **Helsinki Principles** that promote national climate action, especially through fiscal policy and the use of public finance:

Principle 1
Align our policies and practices with the Paris Agreement commitments.

Principle 2
Share our experience and expertise with each other in order to provide mutual encouragement and promote collective understanding of policies and practices for climate action.

Principle 3
Work toward measures that result in effective carbon pricing.

Principle 4
Take climate change into account in macroeconomic policy, fiscal planning, budgeting, public investment management, and procurement practices.

Principle 5
Mobilize private sources of climate finance by facilitating investments and the development of a financial sector which supports climate mitigation and adaptation.

Principle 6
Engage actively in the domestic preparation and implementation of Nationally Determined Contributions (NDCs) submitted under the Paris Agreement.

Read more at https://www.financeministersforclimate.org/

Authors and acknowledgements

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Other consultations
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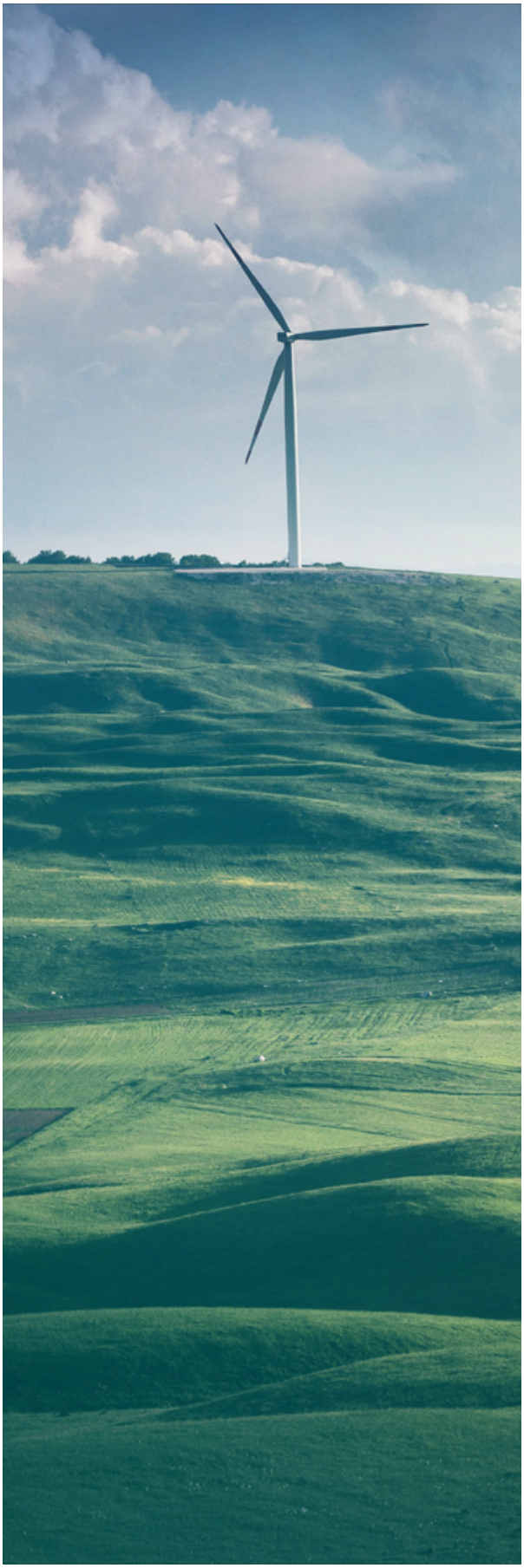
Foreword

In February 2022, the Helsinki Principle 2 workstream of the Coalition of Finance Ministers for Climate Action published a *Report on Strategies for Mainstreaming Climate Action in Ministries of Finance: Governance, Capacities, and Research Practices*. The report found that many Ministries of Finance currently lack the capacity and expertise to mainstream and drive climate action at the speed and scale required. There was also wide recognition that Finance Ministers and Ministries hold critical policy tools for driving climate action through economic, fiscal and financial policies.

The HP2 workstream identified the need for a guide to mainstreaming climate action and so commenced a major collaboration between a wide range of stakeholders. The result at hand is a guide that intends to help Ministries of Finance mainstream climate action into economic, fiscal and financial policy through enhancing their core functions and capabilities according to their specific national circumstances. Rather than being prescriptive, it aims to provide a comprehensive 'menu of options'.

The guide is intended to detail the role Ministries of Finance can take in driving climate action for the benefit of governments, decision-makers and the Ministries themselves. It recognizes that contributing to and supporting climate action by other departments, such as Ministries of Environment, is a large part of the role of Finance Ministers, requiring significant engagement, dialogue and action with all parts of government. Taking on an enhanced role, as recommended in the guide, can only happen if Ministries of Finance can clearly articulate their core tasks and responsibilities at the national level, strengthen their mandates to drive climate action, and introduce this role into national climate governance frameworks. Without such mandates, the necessary resources and expertise might be difficult to acquire.

Although there is a need for urgent action, the implementation of the relevant functions and roles discussed in the guide will require a sustained long-term effort. Therefore, individual Ministries will need to carefully consider issues related to the



implementation and sequencing of actions in the context of their own circumstances and challenges.

The preparation of the guide has involved a lot of expertise: shaped by nearly 30 Ministries of Finance and more than 30 experts and partners of the Coalition, with contributions from Members and feedback from the private and non-governmental sectors. The Coalition is especially grateful for the advice of Professor Lord Nicholas Stern (Grantham Research Institute on Climate Change and the Environment, LSE) and Amar Bhattacharya (Brookings Institution). Nick Godfrey and Anika Heckwolf (Grantham Research Institute) have acted as the coordinators, supported by a senior advisory group and 16 Coalition Members, whose inputs have strengthened the report. Finland and Rwanda have led the work on behalf of the Coalition, as country-leads of the Helsinki Principle 2 workstream. Moving forward, we continue to welcome the views and feedback of stakeholders and external observers.

As a next step, the Coalition will actively engage in supporting Coalition Members to implement the advice herein. We will especially rely on the exclusive network of Institutional Partners and active engagement of Sherpas who are integral to channeling knowhow and information about success-stories to their own Ministries and Ministers of Finance.

The guide will be refined and updated over time, to ensure relevance. We have already recognized that biodiversity loss and nature-related challenges have significant economic and financial consequences that will need to be better taken into account in further updates. The work to this end has already started.

Pekka Morén, Co-chair (Sherpa), Finland
Masyita Crystallin, Co-chair (Sherpa), Indonesia

14 April 2023, Washington, D.C.

Overview

About this guide

This guide covers the case for climate leadership by Ministries of Finance, a framework for mainstreaming climate into their core functions and capabilities, and priorities for action. It is aimed primarily at Ministries of Finance but is designed to be useful to anyone seeking to better understand the role of these ministries in driving climate action.

The guide has been shaped by nearly 30 Ministries of Finance, more than 30 experts and partners of the Coalition of Finance Ministers for Climate Action, and 40 submissions from the private and non-governmental sectors to a global public consultation on an early draft. All Members of the Coalition had the opportunity to review the guide. It is a Helsinki 2 product, led by Finland and Rwanda.

The guide aims to raise awareness among Finance Ministers about the actions and opportunities available for mainstreaming climate action. Rather than being prescriptive, the guide provides a framework of options to help countries enhance their core functions and capabilities to act according to their national circumstances. Aligned with the Helsinki Principles, it is designed to provide the basis for concrete action. It can inform training, technical assistance, knowledge partnerships and research efforts with relevant actors to ensure high-quality analysis, research and support are accessible to Ministries of Finance. It is a living document which will be updated over time to stay relevant.

Taking forward the outlined actions will be critical to implementing the Helsinki Principles. The Coalition of Finance Ministers for Climate Action has been created to support its members to do this.

HELSINKI PRINCIPLE 2

Share our experience and expertise with each other in order to provide mutual encouragement and promote collective understanding of policies and practices for climate action.

How to use the guide

Introduction: Introduces the context and purpose of the guide

GO TO INTRODUCTION

Read this to:

- Understand the need for the guide and its aims
- Understand the methodology used to produce the guide

Part A. Why Ministries of Finance matter for climate action and economic transformation

GO TO PART A

Presents a strategic agenda for action: it explains why Ministries of Finance need to strengthen their role in driving climate action, and how their climate leadership can help them deliver on their core priorities.

Read this to:

- Explore the benefits of taking climate action for Ministries of Finance
- Recognize the key levers available to Ministries of Finance to drive climate action
- Understand the key functions and capabilities that Ministries of Finance need to strengthen to drive climate action
- View a list of existing good practice from around the world

Part B. A Ministry of Finance framework for climate action

GO TO PART B

Presents a practical framework that Ministries of Finance can follow to mainstream climate action into their operations and drive the shift toward a zero carbon, climate-resilient future.

Read this to:

- Explore how to build core functions and capabilities to act on climate
- Understand how to take action and overcome barriers across a series of action areas
- Read in more depth about the steps Ministries of Finance are already taking around the world

Part C. Priorities for action for Ministers and Ministries of Finance

GO TO PART C

Presents an overarching agenda to enable Ministries of Finance to make progress on mainstreaming climate action.

Read this to:

- Understand how the framework can assist in assessing country-level progress and priorities for action
- Discover principles to navigate trade-offs
- Consider 15 transformative actions across building capabilities and capacities, core policies and working with others
- Find out about the implementation support the Coalition will provide

Part D. Appendices

GO TO PART D

Read these to:

- Find out more about the central role of Ministries of Finance in driving climate action in relation to other actors (Appendix 1)
- Review the key entry points for mainstreaming climate action in budget formulation (Appendix 2)
- Learn more about key areas for collaboration and coordination with governmental and non-governmental stakeholders (Appendix 3)
- Learn more about the powerful role played by the Ministries of Finance of the UK and South Korea in recent economic history (Appendix 4)
- See who responded to the global consultation carried out to inform this guide (Appendix 5)
- See the list of abbreviations used in the guide (Appendix 6)

Complementary products in the series

This guide is complemented by the following additional products aimed particularly at Finance Ministers and policymakers:

- A high-level summary brief
- A synthesis report

They are available at:
http://www.financeministersforclimate.org/reports

Executive Summary

Key messages for Finance Ministers and policymakers

- **Ministries of Finance have significant levers** they can pull to accelerate the climate action needed to deliver on the goals of the Paris Agreement and drive sustainable, inclusive and resilient development and growth—but these levers are not yet being fully utilized.
- **Bold climate action can be instrumental in helping Ministries of Finance achieve their core priorities** of macroeconomic stability, growth and responsible management of public finances, with major benefits including:
  - tackling escalating risks that have macro-critical consequences, including economic and budgetary shocks, and rising cost of capital;
  - enhancing economic and financial resilience;
  - generating significant growth and development opportunities including jobs and investment; and
  - delivering clean, secure and affordable energy and food.
- **Ministries of Finance have a window of opportunity** to mainstream climate action within their core functions of economic strategy, fiscal and financial policy. This will involve broad-ranging changes to strengthen governance and leadership, coordination and human and analytical capabilities.
- **A big part of the role of Finance Ministers is contributing to and supporting climate action** by other government departments and other stakeholders. To help Finance Ministers fully utilize the tools at their disposal, their role in driving climate action could be further strengthened and recognized through their mandates and climate governance arrangements.
- **Ministries of Finance have the experience to be the strong leaders the moment demands,** with many demonstrating visionary leadership and progress. Urgent and comprehensive action is needed to take this work further, and this report sets out a framework to guide this process.
- **Taking forward the priority actions will be critical to implementing the Helsinki Principles.** The Coalition of Finance Ministers for Climate Action has been created to support its members to do this.

Why the role of Ministries of Finance matters for climate action and economic transformation

Governments worldwide are facing an unprecedented series of crises: an economic crisis with slow growth, rising debt and challenges in recovering from COVID-19; a cost-of-living and energy crisis; and a climate crisis with ever growing impacts from climate change. Far-sighted leadership is now needed by the public and private sector to deal with these challenges concurrently and build a zero-carbon, climate-resilient economy. This future economy is firmly within the grasp of today's leaders.

Ministries of Finance need to be at the heart of driving this economic transformation: climate action will not be possible without them. From their position at the center of government they coordinate economic strategy and fiscal policy, regulate the financial system, and collectively control, either directly or indirectly, well over US$30 trillion in government expenditure, over one-third of global GDP. They are shareholders in state-owned enterprises, development banks, and the multilateral system. And they will be key to unlocking the global investment to tackle climate change, which needs to be increased and sustained above pre-COVID levels by at least 2% of GDP per year globally, and closer to 4–5% in emerging markets and developing countries other than China.

A big part of the role of Finance Ministers lies in supporting and accelerating action by other government departments and private actors. While Ministries of Finance need to be proactive in their areas of direct responsibility such as reforming the tax system to accelerate the transition through carbon pricing, subsidy policies, and fiscal incentives, they also need to actively engage in supporting Ministries of Environment, Economy, Energy, Agriculture, Transport, Planning, Health and others to drive action and scale up sustainable investments. They will also need to co-lead or share responsibility in areas such as shaping national climate and industrial development strategies, designing support schemes for new sectors, greening the finance and business sectors, shaping the remits of development banks, sovereign wealth funds, and state-owned enterprises, and ensuring that the global financial architecture is fit for purpose.

Climate action is essential for achieving Finance Ministers' core priorities of macro stability, growth and responsible management of the public finances, and will bring at least four major benefits: helping to avoid escalating risks with macro-critical consequences; driving significant growth and development opportunities; creating economic, social and environmental benefits, especially for the most vulnerable members of society; and delivering clean, secure and affordable energy for all. These benefits and opportunities plus the avoided costs and risks mean that climate action can help Ministers of Finance harness the development and growth story of the 21st century.

Ministries of Finance have the experience to be the national and global leaders that the moment demands and they are showing growing engagement and leadership at the heart of the transition to a zero-carbon, climate-resilient economy: from Rwanda's Ministry of Finance and Economy leading on the country's Nationally Determined Contribution (NDC) to Uruguay's Ministry of Finance supporting a transition to almost 100% renewable electricity generation through fiscal incentives to Denmark updating the mission and vision of its Ministry of Finance to drive whole-economy climate action.

However, there is still a substantial disconnect between the ambition of national climate strategies and the policies and resources provided to meet this ambition. Ministries of Finance hold significant levers for accelerating climate action, but many are not being fully utilized. Only a quarter of the members of the Coalition of Finance Ministers are actively involved in all stages of the NDC development and implementation process. Few Ministries of Finance have dedicated climate strategies. Much more investment is needed for a pathway to net-zero by 2050, fossil fuel subsidies must end, and carbon pricing initiatives be expanded.

A range of barriers are hampering the engagement of Ministries of Finance in the climate agenda, from failing to view climate action as a unique long-term growth and investment opportunity to unwillingness to confront risk aversion to new spending commitments. These perceptions are compounded by capacity constraints and the view that climate is a narrow environmental rather than fundamental economic issue.

While Ministries of Finance cannot solve all these challenges alone, more than 80 members of the Coalition of Finance Ministers for Climate Action have already recognized that the risks of climate change to economies are real and that their ministries hold important levers to accelerate climate action. By coming together and signing the Helsinki Principles, they are contributing to the growing awareness and involvement by Ministries of Finance in climate action.

The benefits and opportunities plus the avoided costs and risks mean that climate action can help Ministers of Finance harness the development and growth story of the 21st century.

A Ministry of Finance framework for climate action

To step up, Ministries of Finance need to look for opportunities to mainstream climate action within their core functions and to enhance their capabilities to act. This way, they can help ensure climate action is synonymous with sound economic policy.

The framework we have developed shows how Ministries of Finance can mainstream climate into their three typical core functions: i) economic strategy and vision; ii) fiscal policies and budget management; and iii) financial policy and regulation and oversight of the financial system. To enhance these core functions, it is equally important that Ministries of Finance build their capability to act. **Three capabilities are critical:** i) leadership capability; ii) coordination capability; and iii) human and analytical capability. Cutting across these functions and capabilities **is the critical need for Ministries of Finance to drive forward a just transition** to sustain public support and inform effective policy design.

Ministries of Finance will need to consider the interactions between climate policy instruments in the three functional areas and develop reinforcing packages of measures. Considering the synergies between core functions and capabilities will be key to generating lasting benefits.

MAINSTREAMING CLIMATE ACTION INTO MINISTRY OF FINANCE CORE FUNCTIONS AND CAPABILITIES

Source: Authors

The Helsinki Principles (HPs) are outlined on page 1 above.

The framework is designed to guide and support Ministries of Finance to understand how they can enhance their core functions and capabilities, and describes in detail their critical role in each area, barriers and strategies to overcome them, inspiring real-world examples, and opportunities for action.

Priorities for action and implementation

We have identified 15 transformative actions that, if embraced by Ministries of Finance globally, can help to ensure implementation of the Helsinki Principles and will send a strong signal that the world economy is poised to follow a low-carbon, climate-resilient path.

BUILDING CAPABILITIES AND CAPACITY TO ACT

1. Dedicated Ministry of Finance strategies and strengthened mandates for climate action.
2. Building dedicated capacity for climate action.
3. Active engagement in inter-agency and stakeholder coordination efforts.
4. Investing in skills and expertise.
5. Revamping economic tools, data and decision-making approaches.

CORE POLICIES

6. Introducing fiscal policies to transform macroeconomic incentives for climate action.
7. Using the budget and public financial management to drive transformation in all sectors of the economy.
8. Redesigning the tax system for net zero and climate resilience.
9. Raising, steering and blending finance for investment at unprecedented speed and scale.
10. Leveraging international climate finance.

WORKING WITH OTHERS

11. Mainstreaming climate action into national growth and development strategies.
12. Active engagement in national climate strategies.
13. Developing sustainable, inclusive and resilient investment strategies.
14. Driving the green transformation of state-owned enterprises, national development banks, and sovereign wealth funds in cooperation with central banks.
15. Developing just transition plans and policies.

All Ministries of Finance will have to prioritize and sequence the steps they take. Given the diversity of starting points and key differences between Ministries of Finance in terms of powers, capabilities, culture, flexibility and the structure of the economies in which they operate, pathways and priorities for reform are ultimately country-specific. Accurately identifying these differences is fundamental to determining appropriate organizational reform strategies. As part of determining priorities, Ministries of Finance will also need to navigate a range of trade-offs at the macroeconomic level and at the policy level.

The Coalition of Finance Ministers is committed to supporting its members to implement the actions from the guide. Ways it might do so include via a program of strategic engagement to enhance awareness and recognition of the important role of Ministries of Finance; through enhanced training and technical assistance programs; by developing knowledge and research partnerships; deepening awareness and dialogue on implementation of the guide using regional workshops or country 'roadshows'; organizing global or regional debates with stakeholders in areas of contestation to enhance global consensus; receiving ministerial feedback and sharing of experiences, using the late 2023/early 2024 Ministerial Meetings; and enhancing engagement of Ministries of Finance in national and global climate processes in the run-up to COP28 on climate and COP16 on biodiversity.

The important point is for Ministries of Finance to develop strategies for mainstreaming climate action within their core operations, recognizing that short-term and long-term efforts are needed, with deeper action taken now in priority areas. **There is no time to lose; the impacts of climate change are escalating and acting sooner will drive significant benefits.**

Introduction

This guide highlights the rationale for strengthening the role of Ministries of Finance in driving climate action and provides guidance on how to mainstream climate action into their core functions and capabilities.

Governments worldwide are facing an unprecedented series of crises: an economic crisis with slow growth, rising debt and challenges in recovering from COVID-19; a cost-of-living and energy crisis; and a climate crisis with ever-growing climate and environmental hazards from floods and forest fires to extreme heat, droughts and collapsing biodiversity and nature loss. These crises are interlinked and need to be addressed concurrently.

Far-sighted leadership is now needed by the public and private sector to deal with these challenges and build a zero-carbon, climate-resilient economy. Reaching zero emissions by mid-century and adapting to the fast-changing climate will require no less than a fundamental reorganization of the global economy. It means the total decarbonization of key economic systems in energy production, cities, transportation, industry, water and agriculture (NCE, 2018). It will require reimagining coping mechanisms to adapt to the fast-changing climate and new ways to enhance resilience. These changes will demand a large increase and shift in investment, a significant push on innovation, and action across the whole of government and economy, supported by wide-ranging public policy reform and financing measures. New investment worth around US$4 trillion per annum[1] will be needed globally by 2030 to meet the goals of the Paris Agreement (Stern, Bhattacharya et al., 2021). Investment in emerging markets and developing countries (other than China) alone will need $2–2.8 trillion per year by 2030 (Songwe et al., 2022).

Ministries of Finance need to be at the heart of driving this economic transformation: climate action will not be possible without them. The scale of transformation required demands coordinated action across government that goes beyond the remit of sectoral ministries. From their position at the center of government Ministries of Finance coordinate economic strategy and fiscal policy, regulate the financial system, and collectively control, either directly or indirectly, over one-third of global GDP, well over $30 trillion through their oversight of government expenditure.[2] They are shareholders in state-owned enterprises, development banks, and the multilateral system. And they play a crucial role in supporting and accelerating the leadership of other government departments and private actors. Ministries of Finance will therefore be key to unlocking the global investment to tackle climate change which needs to be increased and sustained above pre-COVID levels by at least 2% of GDP per year, and closer to 4–5% in emerging markets and developing countries other than China (Songwe et al., 2022). At the same time, by increasing their focus on addressing climate change, Ministries of Finance will be better able to tackle the crises they face, driving growth and development, and achieve their core objectives of macro stability, growth and the responsible management of public finances.

This guide highlights the rationale for strengthening the role of Ministries of Finance in driving climate action and provides guidance on how to mainstream climate action into their core functions and capabilities. It underscores the experience Ministries of Finance have which equips them to be the national and global leaders the moment demands, while highlighting that they are not yet fully utilizing their powers to drive climate action. They will need to take bold steps, including reforming economic strategy, reforming fiscal policy through budget and tax measures, and reforming financing policy and the financial system. To make these steps, Ministries of Finance will need to undertake major and broad-ranging institutional and governance reform to strengthen their leadership, coordination, human and analytical capabilities. It will also require them to overcome a range of systemic and other barriers hampering their engagement on climate.

Important momentum and leadership by Ministries of Finance is already building. By signing the Helsinki Principles, more than 80 Finance Ministers from around the world, representing about 40% of global carbon emissions and 66% of global GDP, have recognized that they and their ministries hold important levers for

[1]$ indicates US dollars from hereon in, unless otherwise indicated.
[2]Government expenditure typically under the purview of Ministries of Finance is ~30% of global GDP on average, totaling over $100 trillion (see Zouhar et al. [2021], and IMF World Economic Outlook database).

accelerating climate action.[3] Moreover, there are strong examples of leadership from within and outside the membership of the Coalition of Finance Ministers that provide reasons for hope and optimism, many of which are outlined in this guide. Ministries of Finance now need to build on this leadership to accelerate the transition toward net zero, resilient and just economies. Inaction now will not only significantly increase the cost of action in the future: it will also mean missing out on meeting the Sustainable Development Goals and realizing the development and growth story of the 21st century (Stern, Bhattacharya et al., 2021).

A strategic and practical agenda for action

The overall aim of this guide is to support Ministries of Finance to accelerate climate action by supporting them to identify solutions to the barriers they face. To inform strategy, it aims to sharpen the political and economic case for a more proactive and wide-ranging leadership role for Ministries of Finance on climate action across the key areas of public policy under their responsibility. To inform practice, it explains, using examples and case studies, how Ministries of Finance can enhance their core functions and capabilities to drive sustainable, inclusive, and resilient economic transformation—taking into account the diversity of starting points.

The work on the role that Ministries of Finance can and should play in driving climate action is still in its infancy. A review of the literature reveals only a limited number of structured papers or detailed contributions that articulate what the new and evolving role of Finance Ministers will need to look like.[4] This guide aims to make a contribution toward closing this gap. It should be seen as a starting point, which will be further refined following feedback.

The guide is designed to:

- Connect and leverage the existing products of the Coalition of Finance Ministers for Climate Action across all six Helsinki principles and workstreams and offer guidance on how Ministries of Finance can implement them.
- Shift the climate change discourse so that as much attention is given to the net benefits and opportunities of action as to the costs and risks.
- Showcase examples and case studies of positive action by Ministries of Finance, including ways in which actual or perceived trade-offs can be actively managed and barriers overcome.
- Shape the debate globally around the future role and mandates of Ministries of Finance.
- Inform the ongoing plans of the Coalition to build the capability and capacity of Coalition members under Helsinki Principle 2.[5]
- Signpost readers to more detailed reports, guides and literature.
- Highlight the nexus between climate and linked agendas and global challenges, in particular nature and biodiversity loss and sustainable development, while retaining its focus on climate action—hence the majority of the measures, case studies and recommendations are climate-focused.

See also guide Overview, p10-11

Methodology

This guide is based on an extensive review of existing literature, interviews conducted with officials in Ministries of Finance and consultations with key experts. The starting point for the development of the framework presented in Part B was the 'Taxonomy of Central Finance Functions' proposed by Allen et al. (2015, 2016), which outlines the core policy, regulatory and transactional functions typically performed by Ministries of Finance (or, in some cases, other government agencies).

[3] See https://www.financeministersforclimate.org/.
[4] Notable exceptions to the so-far limited literature are: Delgado et al. (2021) and Orozco and Jaramillo (2021).
[5] Helsinki Principle 2 is: Share our experience and expertise with each other in order to provide mutual encouragement and promote collective understanding of policies and practices for climate action.

The capabilities draw on a range of work, including World Bank (2013) and ODI (2016). Additional inspiration was gained from pioneering work by Orozco and Jaramillo (2021) and Delgado et al. (2021), as well as existing reports produced by the Coalition of Finance Ministers.

The framework was designed, refined and 'tested' through consultation with over 30 organizations and individuals who are global experts in fiscal and climate policy and organizational reform, including those supporting the work of the Coalition. The Expert Advisory Group and Country Steering Group formed for this report provided crucial feedback on the framework (see ***Acknowledgements on p2*** for a list of members). The guide has also benefited from semi-structured interviews with officials in 17 Ministries of Finance, namely:

- Bahamas (Ministry of Finance)
- Chile (Ministry of Finance)
- Denmark (Ministry of Finance)
- Finland (Ministry of Finance)
- Germany (Ministry of Finance)
- Indonesia (Ministry of Finance)
- Ireland (Department of Finance)
- Jamaica (Ministry of Finance and Public Service)
- Malaysia (Ministry of Finance)
- Philippines (Department of Finance)
- Rwanda (Ministry of Finance and Economic Planning)
- Spain (Ministry of Economic Affairs and Digital Transformation)[6]
- Korea (Ministry of Economy and Finance)
- Uganda (Ministry of Finance, Planning and Economic Development)
- United Kingdom (His Majesty's Treasury)
- United States (Department of the Treasury)
- Uruguay (Ministry of Economy and Finance)

The individuals interviewed were typically mid- to senior-level officials, including senior consultants and advisors on climate policy or climate finance, chosen because they serve as Sherpas to the Coalition of Finance Ministers and/or play a leading role in their Ministry's work on climate action.

As mentioned, the guide has also received input from a global consultation on the role of Finance Ministers in driving climate action, launched by the Coalition at COP27. Appendix 5 lists who responded, which includes representatives from public, private, and non-governmental organizations.

'Ministries of Finance'—a note on terminology

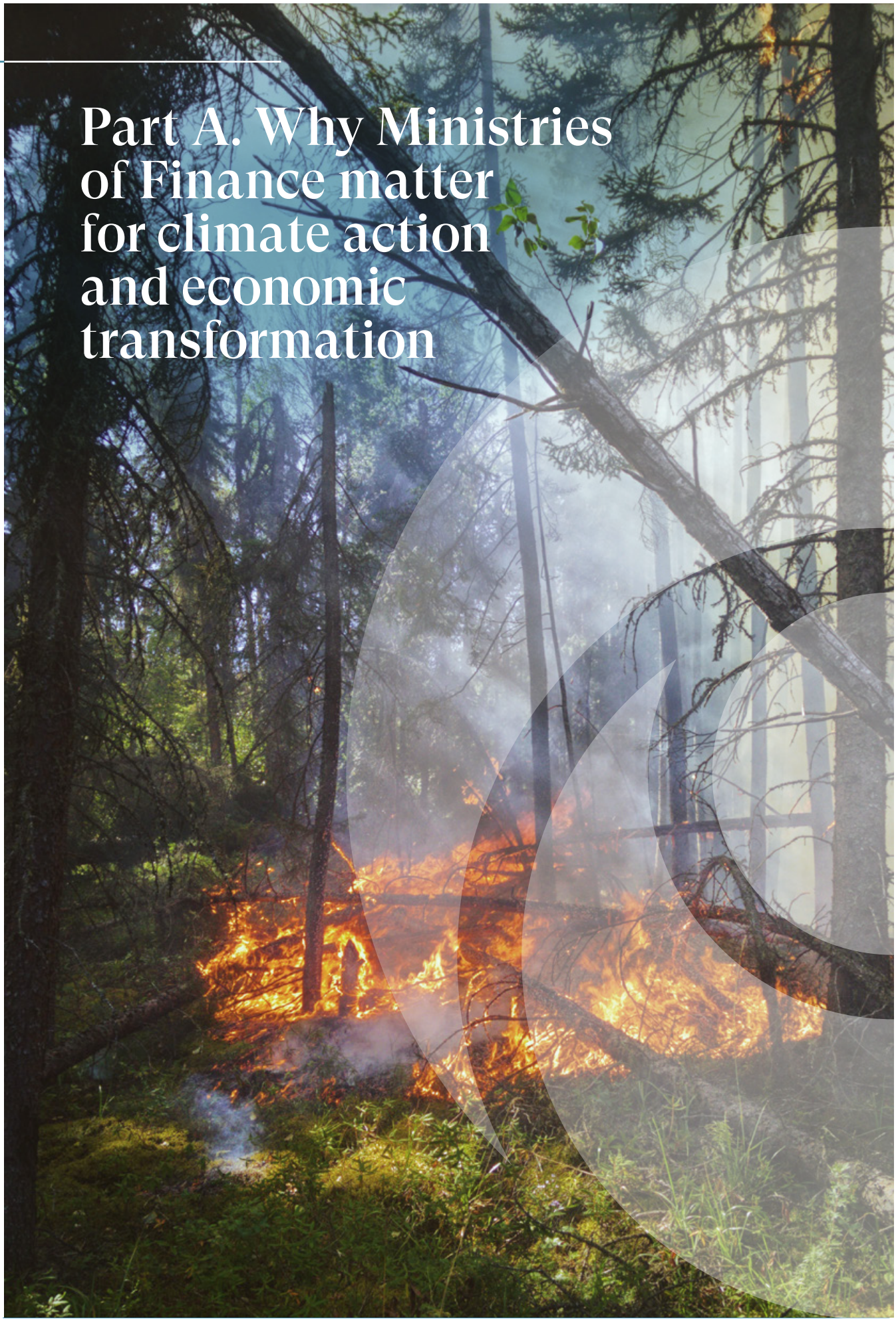
The guide uses the term 'Ministry of Finance' to refer to those government departments or ministries that have responsibility for fiscal policy and public finance.

In some countries the portfolio of a Ministry of Finance may include a wider set of functions, e.g. macroeconomic and financial stability, economic affairs or planning, and reflecting their portfolio they may be called 'Ministry of Finance and Planning' or 'Ministry of Economy'. In other countries the responsibilities referred to in this guide may be split across more than one department or ministry. Many countries have also established autonomous or semi-autonomous agencies that perform some of the functions of Ministries of Finance.

The more technical term 'Central Finance Agency' (CFA) is sometimes used to describe the collective of ministries and agencies performing a country's central finance function (Allen and Krause, 2013).

[6]In Spain, the Ministry of Economic Affairs and Digital Transformation, not the Ministry of Finance, represents the country in the Coalition of Finance Ministers.

Part A. Why Ministries of Finance matter for climate action and economic transformation



This part of the report presents a strategic agenda for action. It explains why Ministries of Finance need to strengthen their role in driving climate action, and how their climate leadership can help them deliver on their core priorities.

Read this to:

Explore the benefits of taking climate action for Ministries of Finance

- Recognize the key levers available to Ministries of Finance to drive climate action
- Understand the key functions and capabilities that Ministries of Finance need to strengthen to drive climate action
- View a list of existing good practice from around the world

An opportunity to tackle multiple crises and drive economic prosperity

The world faces a growing climate crisis. Each successive report from the Intergovernmental Panel on Climate Change has shown that climate change is occurring at a faster pace and is having more severe impacts than previously anticipated. Under the Paris Agreement, the world has agreed to keep global temperatures within 1.5°C of the pre-industrial average, requiring greenhouse gas emissions to fall to net zero by 2050. Yet emissions keep rising, with the world currently on track to see a 10.6% increase by 2030, compared with 2010 levels (UNFCCC, 2022a). The speed of climate change is accelerating, and its impacts are more serious than anticipated, with growing climate hazards from floods and forest fires to extreme heat, droughts and collapsing biodiversity and nature loss (IPCC, 2023). Nature loss too, inextricably linked with climate change, is accelerating at unprecedented rates (IPCC, 2021).

At the same time, around the world national governments are struggling with a series of other crises. On top of the climate and biodiversity crises, the world is facing an economic crisis in the form of slow economic and productivity growth and tightening financial conditions, rising debt and challenges in recovering from COVID-19, and a cost-of-living crisis driven by high and rising energy and food price inflation and threats to energy security. These crises are interlinked and need to be addressed concurrently. Ministries of Finance will need to be at the heart of this effort.

By taking strong action on climate and driving the structural transformation needed, Ministries of Finance can tackle the current series of crises they face and achieve their core objectives of macro stability, growth and development, and the responsible management of public finances.

Climate leadership will bring at least four major benefits to governments and Ministries of Finance:

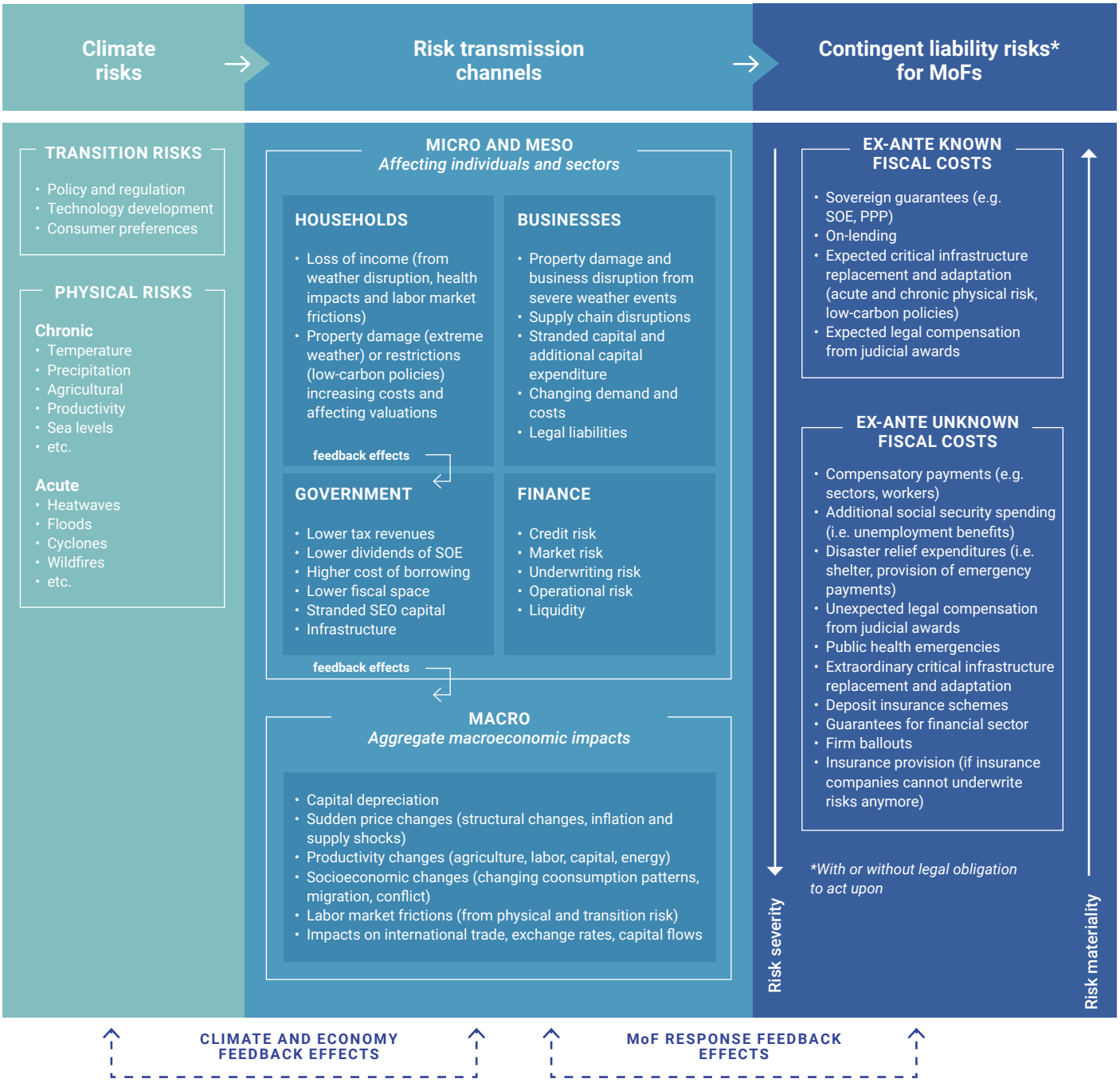
1. Acting on climate will help Ministries of Finance to avoid escalating risks that could have macro-critical consequences, including economic and budgetary shocks and rising cost of capital.
2. Climate action can unlock significant growth and development benefits, while generating a variety of cost savings that alleviate pressure on public budgets.
3. Investing in resilience to the growing incidence of climate hazards can unlock a 'triple dividend for the economy, society and environment.
4. A rapid switch to low-carbon energy presents an opportunity for countries to deliver clean, secure and affordable energy for all and fight inflation.

These benefits, which are interlinked and self-reinforcing, are outlined in further detail on the following pages.

Benefit 1: Avoiding escalating risks that could have macro-critical consequences

Without taking action on climate, Ministries of Finance are likely to face a range of escalating macroeconomic and fiscal risks. They will have to deal with more frequent and intense economic shocks as the physical impacts of climate change adversely affect asset values, economic activity, trade and jobs. This will negatively affect budgets, fiscal positions and debt, and potentially increase borrowing costs, with repercussions for macroeconomic and financial stability (IMF, 2021a). These impacts will make it harder for Ministries of Finance to deliver on their mandates and core priorities, including maintaining macroeconomic stability, responsibly managing public finances and debt, and driving development and growth. Figure A1 outlines how physical and transition risks impact the economy and society through different risk transmission channels.

Figure A1. Climate risks, risk transmission channels and contingent liability risks for Ministries of Finance



Source: Coalition of Finance Ministers for Climate Action (2021c)

Especially prominent risks pertinent to Ministries of Finance include:

- **Cascading economic shocks.** Ministries of Finance will have to deal with more frequent economic shocks. Some estimates suggest that the physical impacts of climate change on economic activity associated with a global temperature rise of 3°C could cause the world economy to shrink by 18% in the next 30 years, with expected losses of around 10% of the world's total economic value (SwissRe, 2021). This figure is likely to be a significant underestimate, however, given the tipping points in the climatic system that mounting evidence is pointing to (e.g. IPCC, 2023). Moreover, the drivers of climate change are rapidly undermining the natural capital on which our economies are based. The collapse of certain nature and ecosystem services could result in a $2.7 trillion decline in GDP by 2030 globally, affecting GDP in low-income and lower-middle-income countries by more than 10% (Johnson et al., 2022) (see Box A2).
- **Budgetary shocks.** The failure to tackle climate-related risks will mean Ministries of Finance will have to spend more on the reconstruction of infrastructure, disaster relief and write-downs of stranded assets, while also experiencing adverse impacts on the tax base. Natural hazard-related catastrophes caused $2.98 trillion of damage between 2010 and 2019, already 50% more than the previous decade (Aon, 2021). Costs are only expected to rise further. For example, currently 23% of the world's power generation capacity, 26% of international port outflows, and 18% of international airport seats are at risk of flooding and these percentages are forecast to rise to 41%, 52% and 37% respectively in a 2°C warming scenario (Marsh McLennan, 2022).
- **Increased cost of capital.** The changing climate has a material impact on sovereign risk and the cost of capital facing Ministries of Finance in climate-vulnerable countries is already increasing, as ratings agencies increasingly take into account limitations in the preparedness of economic institutions to respond to climate risks (Volz et al., 2020). Vulnerability to climate change has been estimated to increase the cost of public borrowing among the most climate-vulnerable countries by 1.17 percentage points (Kling et al., 2018; Buhr et al., 2018). Ongoing work using future-focused projections suggests these trends will only intensify.[7]
- **Increased risk of climate litigation.** With over 2,000 documented cases of climate change litigation around the world, litigation presents a growing risk for governments and Ministries of Finance, including through legal challenges to their own policies and decisions or challenges to government procurement processes and funding decisions (IPCC, 2022; Setzer and Higham, 2022). Ministries of Finance may also face repercussions from the financial risks resulting from climate-related litigation against private financial institutions (see Box B7). Climate litigation is now recognized by the IPCC as a factor that can have a significant impact on the 'outcomes and ambition' of climate governance (IPCC, 2022).
- **Increased costs of a delayed disorderly transition.** Compared with a timely and coordinated transition, doing 'too little, too late' will not only massively decrease the chances of meeting the goals of the Paris Agreement: it will also drive up the cost of the transition for Ministries of Finance (see IMF 2022a) and could result in substantial economic damage (e.g. Moseley and Hannon, 2021).
- **Human suffering and social discontent.** Without ambitious action, Ministries of Finance will face ever growing pressures for financial support from groups negatively affected by climate impacts and a disorderly transition, who face growing vulnerability and poverty. While adaptation is essential, limits to adaptation are already being reached in some locations. Climate change is already pushing more than 26 million people temporarily or permanently under the international extreme poverty line every year (Hallegatte et al., 2017). Without adequate action on climate, this number is expected to rise to up to 130 million by 2030 (Jafino et al., 2020). Moreover, many people are already being forced to migrate and displacement is set to increase, especially across Africa, South Asia and Latin America (World Bank, 2018).
- **Failure to meet climate policy objectives.** Without greater action by Ministries of Finance, it is unlikely that countries will meet their domestic or international policy commitments, creating tensions with other key line ministries and global partners and potentially resulting in far-reaching geopolitical and economic consequences.

[7] A growing range of tools is being developed, such as ASCOR (Assessing Sovereign Climate-related Opportunities and Risks), which are making it easier for investors to track government emission reduction targets, climate-related policies, legislation, carbon pricing, sectoral policies and adaptation planning and preparedness (PRI, 2022).

Benefit 2: Unlocking major growth and development benefits while generating cost savings

Strong climate action by Ministries of Finance can help them to ensure their countries meet their core economic and social objectives by driving growth and development. The costs and risks of ambitious climate policies are not only manageable but are significantly outweighed by their benefits (IMF, 2022a). While the physical costs and risks of climate change are often systematically underestimated (DeFries et al., 2019), so are the overall net benefits of action.

By driving climate action, Ministries of Finance can help their countries realize several important economic opportunities. These include:

- **Unlocking new growth opportunities.** While opportunities will be country-specific, recent estimates suggest that the transition to net zero could create new industries worth $10.3 trillion to the global economy by 2050 (Arup and Oxford Economics, 2023). By investing in the transition to low-carbon economies, Ministries of Finance can help their economies create new comparative advantages and major trading opportunities (WTO, 2022). By contrast, late movers risk reduced growth, productivity and competitiveness (Systemiq, 2021). With the right policies, Ministries of Finance can help unlock these new growth opportunities.
- **Spurring innovation and discovery.** Innovation is the key to sustainable growth. The net zero transition is already shifting the technological frontier rapidly as the world's economies shift from traditional and well-established industrial processes and consumption patterns to new and unexplored ones. Technologies in sectors accounting for nearly three-quarters of emissions are expected to be cost-competitive before 2030 (Systemiq, 2021); in turn, this will trigger their scaling-up to mass market. Ministries of Finance can play a key role in providing the funding and incentives needed to drive climate-friendly innovation in their national economies (Stern and Romani, 2023; see also Box B1 on innovation).
- **Maximizing job opportunities.** Ministries of Finance can utilize the transition to net zero to create new job opportunities. Estimates suggest the transition could create up to 65 million new low-carbon jobs by 2030 globally—a net increase in employment of around 27 million jobs—in areas ranging from renewables and energy-efficient buildings to agriculture and land restoration (New Climate Economy, 2018). Similar estimates exist at the national and regional levels. For instance, Cavallo and Powell (2021) find that the process of implementing countries' Nationally Determined Contributions (NDCs) in Latin America and the Caribbean could create 15 million jobs by 2030.
- **Recovering faster from economic downturns.** In the near term, too, climate-friendly investments can help Ministries of Finance unlock new drivers of jobs and growth. Investments such as those in energy efficiency and ecosystem restoration could create twice as many jobs per dollar than non-green investments in fossil fuels or road building (Jaeger et al., 2021), while also generating stronger and longer-lasting fiscal multipliers than non-green investments (Batini et al., 2021). At a time of economic slowdown, Finance Ministers can use strong public policy and spending to drive investments that create jobs in new sectors (see Functions 1 and 2 in the Framework, Part B).
- **Improving fiscal sustainability.** Ministries of Finance that act now can future-proof and grow their tax bases, which are already shifting in many countries due to higher vehicle energy efficiency, electrification and shifts toward new (undertaxed) technologies and sectors (IMF/OECD, 2021). Taking decisive climate action now provides Ministries of Finance with the opportunity to future-proof their revenue bases and ensure long-term fiscal sustainability by identifying new sources of revenue for investment in the new economy. In the medium term, climate policy can lead to new sources of tax revenue as clean sectors become major new pillars of the economy. Investing in low-carbon energy and reducing fossil fuel imports could also bring substantial benefits to public budgets and trade balances. New renewable energy projects added in 2020, for example, are estimated to result in lifetime savings for emerging economies of up to $156 billion compared with business-as-usual (IRENA, 2021).

- **Promoting a wide range of social, health and environmental co-benefits.** Climate action offers an opportunity for Ministries of Finance to play a key role in helping their national economies capture a wide range of environmental, social, gender-related and health benefits that will materialize regardless of their impact on emissions. For example:
    - Addressing nature loss by investing in the green economy is critical for a successful transition to net zero but also protects the natural capital on which our economies depend (see Box A2).
    - Climate action can significantly reduce pressure on health services. A range of studies suggest that global health co-benefits even outweigh the cost of mitigation policies (see Sampredro et al., 2020).
    - Climate change disproportionately impacts women and girls, yet climate action can also be a driver of gender equality, create new opportunities to bring women into the workforce and protect their livelihoods (UNDP, 2023). Closing the gender gap in the green economy could increase global GDP by 1.7% annually, according to one estimate (BCG, 2021).

Benefit 3: Unlocking a 'triple resilience dividend': for the economy, society and environment

The key role Ministries of Finance can play in unlocking wide-ranging benefits from investing in adaptation and resilience is especially important. The economic impacts of climate change are already evident for many countries in the form of extreme temperatures, rising sea levels and acidifying oceans, and increasingly frequent and more extreme weather- and climate-related events like wildfires, droughts, hurricanes and floods. These impacts put lives and livelihoods at risk and, without action, will carry an ever-growing price tag for the fiscus of many countries, undermining the ability of Ministries of Finance to meet their core objectives.

Investing in adaptation and resilience can generate a so-called triple resilience dividend (shown in Figure A2) in the form of avoided economic losses (the first dividend), but also economic benefits (second dividend) and wider social and environmental benefits (third dividend) (Global Commission on Adaptation, 2019; Heubaum et al., 2022; Roezer et al., 2021). The second and third dividends are especially important since they accrue regardless of whether actual climate risks materialize. Initial analysis suggests that combined, the second and third dividends from investing in adaptation and resilience are often larger than the first: they can generate project benefit–cost ratios greater than 1 even when the value of avoided losses is not considered (Heubaum et al., 2022). The Global Commission on Adaptation (2019) estimates that global investments of $1.8 trillion until 2030 in improved warning systems, resilient infrastructure and water resources, improved dryland agriculture and better mangrove protection could generate total net benefits of $8.9 trillion, a benefit–cost ratio of 4.8 to 1, and a net present value (NPV) of $7.1 trillion.

Figure A2. Example 'triple dividend' benefits from investing in adaptation and resilience

Dividend 1: Avoided losses +	Dividend 2: Economic benefits +	Dividend 3: Social and environmental benefits
• Early warning systems (EWS) save lives and assets worth at least 10 times their cost. Just 24 hours warning of a coming storm or heatwave can cut the ensuing damage by 30%. Spending $800 million on EWS in developing countries would avoid losses of $3–16 billion. • Infrastructure that is more climate-resilient can add around 3% to the upfront costs yet provides benefit–cost ratios of around 4:1. With $60 trillion in projected infrastructure investment between 2020 and 2030, the potential benefits from early adaptation are enormous.	• Investing in drip irrigation technologies to address water scarcity, now widely used and replacing traditional systems, can lead to higher crop productivity and associated incomes. • Adaptation investments to reducing flood risk in urban areas lowers financial costs, increases security, and makes investments subject to high climate risk-climate risk investments more economically viable.	• Mangrove forests provide over $80 billion per year in avoided losses from coastal flooding and protect over 18 million people. But they also contribute $40–50 billion annually in non-market benefits in fisheries, forestry and recreation. Combined, the benefits from protecting and restoring mangroves are up to 10 times greater than the costs.
= A triple dividend		

Source: Adapted from Global Commission on Adaptation (2019).

Benefit 4: Delivering clean, secure and affordable energy while moderating inflation

The current macroeconomic environment and inflationary pressures further underscore the importance of Ministries of Finance supporting investment in the low-carbon future. Since the outbreak of the COVID-19 pandemic and Russia's invasion of Ukraine, many countries dependent on fossil fuels have been facing spiraling energy costs and inflation, which have further aggravated the already challenging macroeconomic environment, especially in emerging markets and developing countries, where debt is yet to return to pre-pandemic levels.

While many countries are facing growing pressures for fiscal consolidation, the case for investing in climate action and the energy transition is stronger than ever before. Investment in climate action is a big part of the answer to the current inflation and energy crisis (Kyriakopoulou, 2022). New sources of low-carbon energy are now at cost parity or cheaper than many fossil fuel energy sources, the costs of wind and solar energy having reduced sharply over the last decade (IRENA, 2021). In most cases, green energy investment can create new direct employment opportunities quickly, as renewables can be rapidly installed practically everywhere (ILO, 2018).

If global inflationary pressures prove more persistent and the collective policy response more contractionary than expected, the case only strengthens for supporting the energy transition. Expanding investment in renewables, electrification and energy-efficiency can impart a counter-inflationary force and reduce the vulnerability of countries to global supply bottlenecks, contributing to energy security and limiting the volatility of energy price spikes.[8] For net importers of fossil fuels, being able to reduce imports as a result of expanding domestic renewables can have a positive effect on their trade balance, reducing the likelihood of debt default (Mercure et al., 2021; see also WTO, 2022). And with a surplus of desired net saving globally likely to exert some moderation on interest rate increases, the returns to promoting green energy investments should remain promising even if upfront financing needs are higher (Llewellyn, 2022).

Investing in low-carbon energy infrastructure is not just about short-term recovery and inflation reduction—it is also likely to help Ministries of Finance generate substantial savings for national economies and enhance resilience to future shocks. Whereas major innovation opportunities in fossil-fuel based technologies are long depleted, productivity growth in green technologies is high. A recent study suggests that as the price of renewables continues to fall, switching from fossil fuels to renewable energy could save the world as much as $12 trillion by 2050, without accounting for climate damages or the co-benefits of climate action (Way et al., 2022).

Some governments, supported by Ministries of Finance, are already addressing the cost-of-living crisis through expanding renewables, sustainable transportation modes, and targeting support to citizens at the same time. Countries such as Uruguay and Finland have already successfully diversified their energy sources away from fossil fuels. For now, these countries are proving better insulated than their neighbors from global energy price inflation (see Box A1 for further examples).

> **New sources of low-carbon energy are now at cost parity or cheaper than many fossil fuel energy sources, the costs of wind and solar energy having reduced sharply over the last decade.**

[8] Oil supply shocks have occurred frequently since World War II and renewable sources of energy display greater price stability and can be constructed much faster than fossil fuel capacity to meet shortfalls in generation (Bhattacharya et al., 2022).

Box A1. Using renewable energy and climate action to tackle the cost of living and inflation—examples

In 2022, the COVID-19 pandemic, rising energy costs and the Russian invasion of Ukraine together created a need for governments to address the cost-of-living crisis facing citizens.

Some governments are already investing in boosting the renewable energy sector as part of energy support packages, with some including policies to support individuals:

- **Lithuania** is combining a price cap on gas and electricity prices with a €1.12 billion investment for greater energy security through renewable energy and green renovation production capacity. Grants will be given to modernize buildings and develop green innovation in building design. Funds are also allocated to developing infrastructure for EV charging, installation of solar power stations and replacement of fossil fuel boilers (Sgaravatti et al., 2022).
- **France's** Emergency Renewable Energy Package makes it easier for wind and solar farms to sell their electricity on the market for 18 months without going through the existing process of Contracts for Difference (CfDs). France has also doubled the size of the Oléron offshore wind zone with the aim of building 40 GW of offshore wind by 2050 (WindEurope, 2022).
- T**he United States government has explicitly recognized the potential for climate action to help tackle inflation** in the US Inflation Reduction Act, the most significant climate legislation in the US to date. The Act includes $369 billion of funding for renewable energy and climate action over the next decade. It is driven by the expectation that the increased production of a range of goods, from solar panels to EVs, will increase supply relative to demand and bring down prices in the medium term (The White House, 2022).

Some governments have introduced measures to accelerate other sector transitions while supporting citizens:

- **Spain** provided free rail tickets for some journeys throughout the fall of 2022 to help citizens deal with rising inflation. The scheme has been extended until the end of 2023, when its effects on the economy and environment will be assessed (Euronews, 2022).
- **German** citizens had access in summer 2022 to regional public transportation for a single ticket of only €9 per month, creating a financial incentive for people to use public transportation and reduce car use. The Association of German Transport Companies (VDV) estimates that over 52 million people had purchased the €9 ticket by the end of August, resulting in a decrease of 1.8 million tons of CO_2 emissions and a 7% reduction in air pollution (Gohl and Schrauth, 2022). In October 2022, the government announced the introduction of a new monthly 'climate ticket' priced at €49 (Deutsche Welle, 2022).

While more research is needed, **there are early signs that countries that experience lower inflation have diversified energy sources and have a greater commitment to renewable energy transition in their total energy mix.**
For example:

- **Switzerland** has managed to contain its inflation at a relatively low rate (3.5%) compared with the EU average of 10% in 2022. This is partly because of the regulated market for prices as well as the large share of renewable energy produced within the country. Almost 99% of electricity is produced by low-carbon technologies and electricity prices have not been greatly affected by the shocks of rising gas/fossil fuel prices (Mandruzzato, 2022).
- **Finland** has one of the lowest annual inflation rates in the EU, at 7.9% in 2022. While the nature of the exact link between inflation and renewables remains unclear, over 43.8% of Finland's total final energy consumption comes from renewables, compared with an EU average of 22.1% (EC, 2022).
- In **Uruguay**, the Ministry of Finance has supported the transformation of its energy system to close to 100% renewable electricity production. Uruguay is now seeing lower inflation rates than any other Latin American country: in September 2022 the median increase over 2021 in the annual inflation rate was 1.5%, compared with 5% for the main economies of Latin America (MoF Uruguay, 2022).

Source: Prepared by Oleksandra Plyska (Grantham Research Institute, LSE)

Unlocking the development and growth story of the 21st century

The combination of these benefits and opportunities and avoided costs and risks means that Ministries of Finance can use climate action to unlock the 'development and growth story of the 21st century' (NCE, 2016; Stern, Bhattacharya et al., 2021). While climate action and economic development are sometimes considered to be competing goals, the evidence shows that with the right policies they can be mutually reinforcing. Ministries of Finance that fail to work with others to address climate change will contribute to creating an unstable and hostile world, which will at best make it very difficult and at worst impossible for countries to achieve their development goals. By contrast, Ministries that embrace climate action can help to unlock considerable development benefits, drive competitive advantage, create new jobs, and help fight poverty (Lankes et al., 2022).

The consequences of inaction are likely to be especially acute in developing countries. Loss and damage from climate change could impact significantly on the resources available to Ministries of Finance in these countries , which could force governments to divert resources away from economic development and poverty reduction to address the costs.

By contrast, poverty reduction itself reduces climate vulnerability. World Bank estimates suggest that rapid and inclusive growth could halve the number of people falling into poverty due to climate change by 2030 (Jafino et al., 2020). Indeed, climate action is intrinsically linked to the 2030 Agenda and the Sustainable Development Goals (SDGs) through Goal 13 on climate and all the other 16 goals (see e.g. Dzebo et al., 2018). In short: failure on climate action will lead to failure on poverty eradication, and failure on poverty eradication will lead to failure on climate action.

Governments, including Ministries of Finance, therefore have a central role to play in ensuring that economic development and climate action go together. As this section has shown, climate leadership can help Ministries of Finance create the economy of the future based on new forms of high value-added employment, and on clean, secure and affordable energy, with places in which people can live and work affordably and move around easily. It can also help them to create an economy resilient to the impacts of climate hazards and that protects vital biodiversity. This future economy is firmly within the grasp of today's leaders. Ministries of Finance will play a central role in this effort.

Box A2. The essential role of climate action for protecting the natural capital that economies depend on

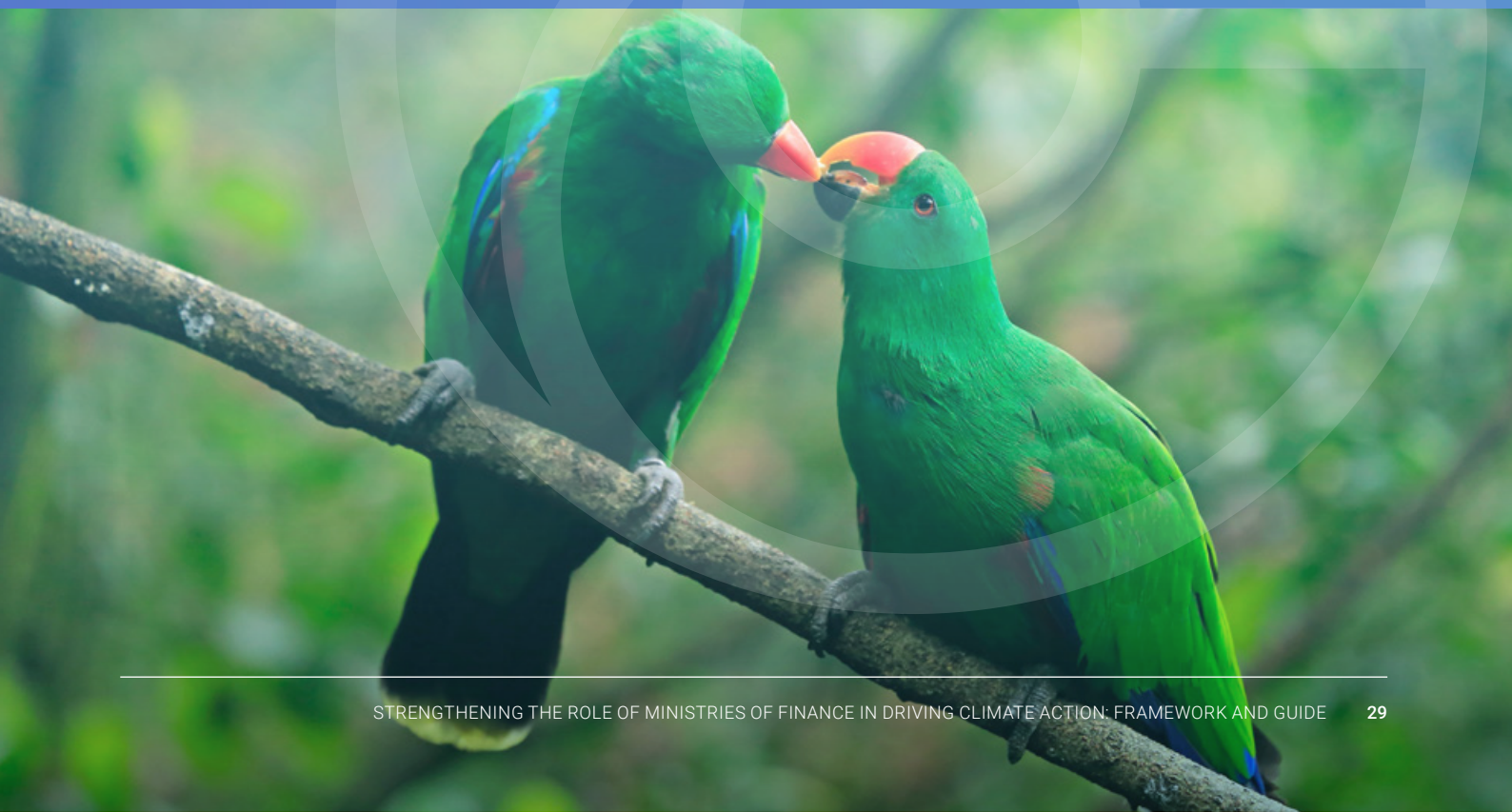
The future of humanity depends on conserving and restoring natural systems that provide our food, clean water, clean air and a stable climate. Over the past 70 years, the world has observed a previously unseen level of economic development—while drawing down its natural capital (Dasgupta, 2021). Humanity's demands now far exceed nature's ability to supply (Steffen et al., 2015). Nearly one in eight animal and plant species are now threatened with extinction; extinction rates are at least tens to hundreds of times higher than they have averaged over the past 10 million years (IPBES, 2019). Research indicates the strong economic case for action: the monetary cost citizens worldwide would need to pay to stop biodiversity and ecosystem services loss may be twice as high if policymakers delay global action by as little as 10 years (Micklin, 2007).

Science increasingly shows that nature loss and climate change are interrelated and mutually reinforcing. Neither crisis can be successfully resolved unless both are tackled together (IPCC, 2021) and a government-led nature- or climate-only approach is likely to be fiscally inefficient, socially and environmentally ineffective, and not sufficient to reach national or global climate and nature-related targets. The recent Helsinki Principle 5 Coalition report details how the global economy is embedded in nature, as it is dependent—and has an impact—on nature, placing nature loss squarely in the realm of economic decision-makers (Coalition of Finance Ministers for Climate Action, 2022a). That report outlines the need for Ministries of Finance to develop an integrated approach to managing climate- and nature-related risks. Nature-based solutions—such as investments in the restoration of forests or conservation of mangroves—play an important role in addressing climate change (Griscom et al., 2017). Investments in land and sea-based mitigation and adaptation can channel funding into activities that could generate significant improvements in biodiversity and ecosystem services, reducing risks stemming from their deterioration.

There are some trade-offs between nature and climate action that need to be managed. Infrastructure development and material consumption generally have significant impacts on nature. The climate transition requires building new infrastructure and retrofitting old and replacing inefficient cars with electric alternatives. This will require increased mining of iron ore for steel and rare earth minerals for batteries. Governments should take these potential impacts into account and manage them strategically.

Nature loss could have severe economic impacts because environmental degradation follows a non-linear pattern—it can compound and result in catastrophic ecological losses. This is exacerbated by the fact that few human-made substitutes for ecosystem services exist, in contrast to the case of low-carbon alternatives to fossil fuels. Nature-related risks can transmit to Ministries of Finance through a variety of mechanisms, such as increased disaster risk and welfare payments, a more acute need to invest in ecosystem restoration, and greater political instability or conflict—all with direct fiscal implications.

Source: Prepared by Samantha Power (World Bank)



The unique position of Ministries of Finance in the drive to net zero and climate resilience

Capturing these significant economic and wider benefits will require far-sighted leadership by national decision-makers, with Ministers of Finance at the heart of the effort. As government bodies at the center of coordinating economic, fiscal and financial policy, Ministries of Finance are uniquely placed to unlock the economic and social benefits from this transition. While not every Ministry of Finance is the same, with important differences between their mandates, structures and cultures (Allen et al., 2015, 2016; see Part C), they typically have a shared set of priorities which climate action can help them achieve. And they often have a range of similar functions and capabilities that allow them to enable, and even drive, the kind of economy-wide transformation required to achieve a net zero, climate-resilient economy—as described in the framework in Part B.

Ministries of Finance are often one of the few government institutions able to oversee a country's entire economy and all aspects of public policy:

- **They help shape national visions, plans and investment strategies,** giving them a critical role in determining their country's pathway to a net zero, climate-resilient economy.
- **They usually have direct control over macro-fiscal policy and regulatory functions,** including taxation, budget and debt management, enabling them to design and/or oversee the policy reforms needed to drive structural transformation.
- **They oversee the expenditure** of all main government departments—giving them direct or indirect control over one-third of global GDP, worth well over $30 trillion, and a crucial role in collaborating with line ministries to shift capital and drive the necessary investment in the sustainable, resilient and inclusive transformation of their economies.
- **They are shareholders and/or regulators** of the activities of state-owned enterprises, sovereign wealth funds and national and multilateral development banks, set the remits of central banks, and often play a key role or have overall responsibility for regulating the financial sector, placing them in a critical position to help shift these institutions onto a green trajectory.
- **They are owners of a range of powerful economic tools and approaches,** from macro forecasting and modeling to economic impact assessments and guidance on investment appraisals that help shape the spending decisions of other government departments related to climate action.
- **They are members of regional and global networks and coalitions,** playing a key role in shaping the global financial architecture and international norms and priorities around climate action.

A big part of the role of Finance Ministers is in supporting and accelerating action by other government departments, the private sector and civil society. While a successful transition to net zero will only be possible with the active involvement and leadership of Ministries of Finance, they cannot act alone and should seek to promote a collaborative approach. They need to be proactive in their areas of direct responsibility, such as reforming the tax system and accelerating the transition through carbon pricing, subsidy policies and fiscal incentives, but they also need to actively engage in supporting others to scale up climate action.

Ministries of Environment, Economy, Energy, Transport, Planning, Development and many others have an equally critical part to play—and many of these agencies have been acting on climate for decades. Ministries of Finance need to match this effort and enable and support the climate leadership of other actors, including through the budget process. This should include working alongside Ministries of Environment, Climate and Development in the key international climate processes such as the UNFCCC Conference of the Parties, and co-leading or sharing responsibility in areas such as shaping national climate and industrial development strategies, designing support schemes for new sectors, greening the finance and business sectors, shaping the remits of central banks, development banks, sovereign wealth funds, and state-owned enterprises, and ensuring that the global financial architecture is fit for purpose.

Ministries of Finance have the experience to be the national and global leaders the moment demands. They were at the heart of responding to major past economic challenges that involved tackling immense risk and driving structural transformation.[9] In the decades following World War II, Ministries of Finance, often together with planning ministries, public financial institutions and central banks, played a highly proactive role in coordinating industrialization-led economic transformation across many of today's wealthiest countries. They were central to ensuring financial policy goals were geared to serve the needs of industrial policy (Mikheeva and Ryan-Collins, 2022).

This experience serves as a reminder that, firstly, Ministries of Finance did not let the uncertainties and risks around the development of new sectors and deployment of new technologies deter their industrial transformation, and secondly, that a wide range of policy tools were used to steer financial capital into priority sectors fundamental to transformation while limiting investments in consumption-oriented sectors.[10] These kinds of approaches enabled South Korea to become an East Asian industrial powerhouse and major exporter in just four decades (see Appendix 4). In other words, Ministries of Finance have a wide range of analytical, regulatory and planning capacities to enable strategic policy coordination and also to overcome fragmentation within national financial governance institutions to accelerate the transition to net zero (ibid.).

More recently, their response to COVID-19 demonstrated that Ministries of Finance can be flexible, innovative leaders. During the early months of the pandemic, some won particular praise as crisis managers for their leadership, innovation and decisive action to protect lives and livelihoods. Globally, over $18.16 trillion had been spent on rescue and recovery by mid-2022, resulting in unprecedented increases in government expenditure (Coalition of Finance Ministers for Climate Action, 2021b; O'Callaghan et al., 2022a). As well as highlighting their potential as active investors in the economy, this spending led to renewed debates about the current fiscal rules governing public spending on investment. Equally, the role that many Ministries of Finance played in responding to the 2008 global financial crisis demonstrates just how fundamental their leadership can be in a national crisis (see Appendix 4).

The nature of the climate challenge—one of immense risk and new economic opportunity—will require Ministries of Finance to urgently enact qualities similar to those demonstrated in previous crises as they tackle the climate crisis. Those that can do so and that can rethink their role in responding to the defining challenge of our time will be at the forefront of the transition to a net zero, resilient world. This will demand Ministries of Finance to become proactive drivers of the zero carbon, climate-resilient economy, coordinating across the full range of economic, fiscal and financial policy areas and related agencies.

The Coalition of Finance Ministers for Climate Action demonstrates that Finance Ministers can work together as a global family to identify collective challenges and work jointly toward shared solutions. More than 80 Finance Ministers have already come together and signed the Helsinki Principles in recognition that the risks of climate change to economies are real and that their ministries hold important levers for accelerating climate action.

[9] Paragraph based on a contribution by Olga Mikheeva (UCL IIPP).

[10] For instance, during the 1940s–70s, Ministries of Finance in Mexico and Korea worked closely and coordinated with the national investment banks Nacional Financiera and Korea Development Bank respectively to exchange personnel and training approaches on emerging technologies and new sectors. Norway's Ministry of Finance was instrumental in expanding and steering a network of state-owned commercial banks that supplied much needed industrial credit and supported regional development during the 1940s–80s. Japan's Ministry of Finance was instrumental in channeling public saving funds to the Japan Development Bank, which was in turn key to financing industrialization projects after WWII. Today, China's Ministry of Finance coordinates with China Development Bank subsidies for megaprojects and soft-loan schemes (Mikheeva and Ryan-Collins, 2022).

The urgent need for action and to scale up investment

The need for action by Ministries of Finance is more urgent than ever before. The window to avoid dangerous climate change is narrowing rapidly. Following an unprecedented drop of 5.4% in 2020, global greenhouse gas emissions have bounced back to pre-COVID-19 levels and continue to rise (Friedlingstein et al., 2021). Existing mitigation commitments still fall far short of delivering the 45% reduction in emissions scientists say is required by 2030 to avoid the worst impacts (IPCC, 2022). Implementation of current NDCs points to a temperature rise of 2.4–2.6°C by the end of the century (UNEP, 2022b). Meanwhile, the IPCC makes clear that climate change has already caused "substantial damages and increasingly irreversible losses, in terrestrial, freshwater and coastal and open ocean marine ecosystems"—highlighting the connection between climate change and biodiversity—and that "the extent and magnitude of climate change impacts are larger than estimated in previous assessments" (IPCC, 2022).

Not only do national climate plans lack the necessary ambition, but there is also a substantial disconnect between what ambition exists and the supporting policies and resources provided—often by Ministries of Finance. Only around a quarter of the members of the Coalition of Finance Ministers are actively involved in all stages of the NDC development and implementation process (Coalition of Finance Ministers for Climate Action, 2020b). Meanwhile, G20 governments provided nearly $600 billion annually on average in explicit fossil fuel subsidies from 2017 to 2019. Implicit subsidies, reflecting environmental costs and foregone consumption taxes, were as high as $5.9 trillion in 2022 (Parry et al., 2021). Globally, carbon pricing initiatives cover less than a quarter of emissions and prices are not sufficiently high to shift economy-wide incentives (World Bank, 2022b). Only 14 out of 35 OECD countries are practicing green budgeting (OECD, 2021a) with public procurement worth $11 trillion in 2018 still largely invested in high-carbon goods and services (World Bank, 2021b). And while the recovery from the COVID-19 crisis was heralded as an opportunity to build back better and greener, of the more than $18 trillion spent on recovery and rescue, less than $1 trillion (around 5%), can be considered green (O'Callaghan et al., 2022b).

Global investment to mitigate and adapt to climate change needs to be significantly increased. Climate action is characterized by structural transformation in all the key systems and related sectors of an economy (New Climate Economy, 2018). It is about creating an economy based on clean, secure and affordable energy, cities and communities in which people can move and breathe easily, resilient and productive agriculture, and dynamic green industries and jobs. To achieve this transformation, countries will need to reverse the trends of slow growth, declining investment and low public spending that have followed the global financial crisis and COVID-19 (Coalition of Finance Ministers for Climate Action, 2021b). This means shifting both the scale and composition of investment. It means increasing investments in all forms of capital—physical, human, natural and social, and ensuring that all investment is future-proofed and in line with a net zero, resilient future.

A range of estimates now exist[11] for these investment needs in both the public and private sectors and in different locations. For example:

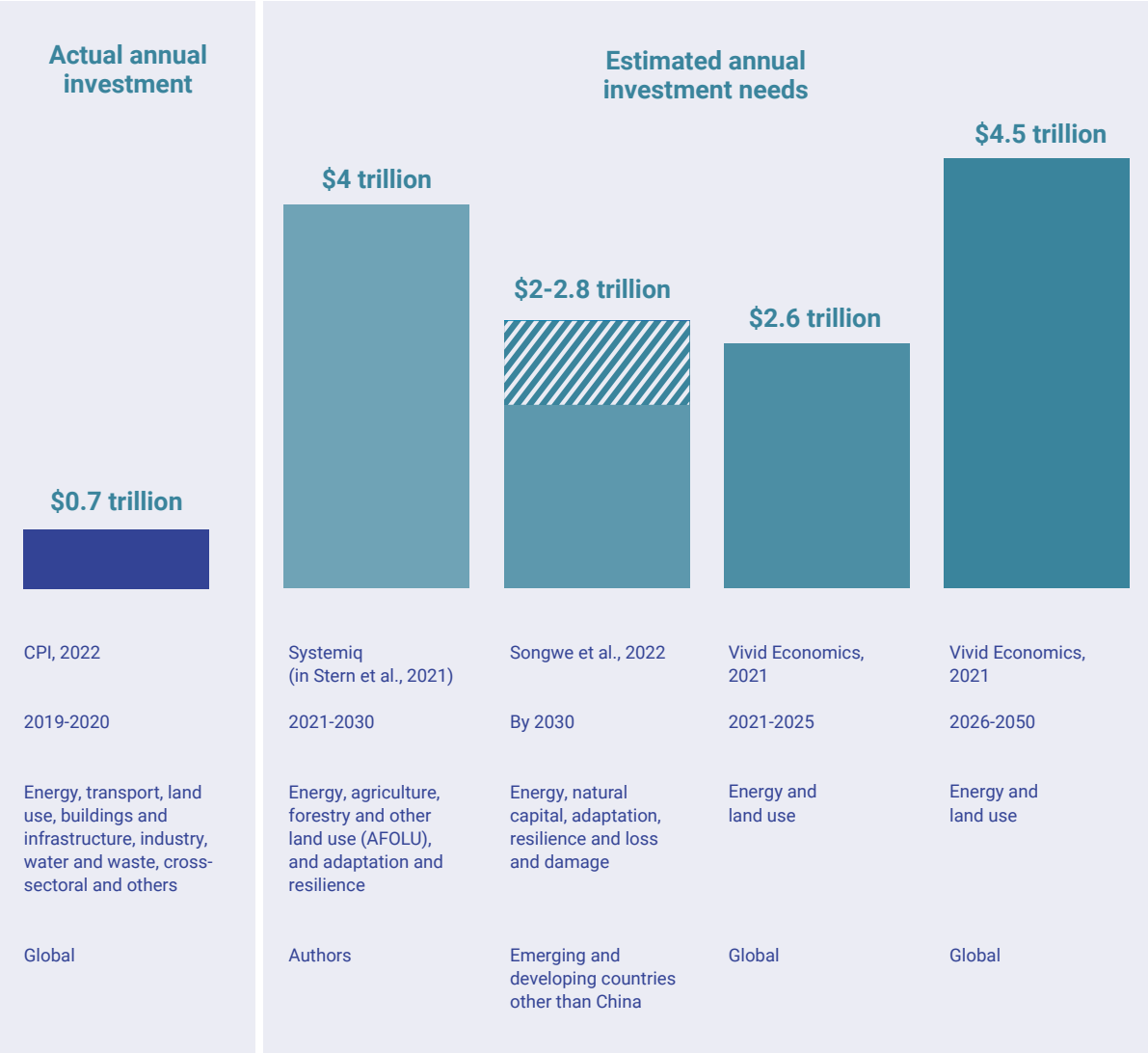
- The IEA (2021b) has analyzed a net zero by 2050 scenario and estimates that global annual investment in the energy sector will need to reach $5 trillion by 2030. This is more than double the $2 trillion average annual investment the energy sector received in 2016–2020.

[11] See Table A2.2 in Songwe et al. (2022) for an overview. It is important to note that these estimates focus mainly on energy transformation, and to a lesser extent natural capital. There is substantial uncertainty on the costs of adaptation, resilience, and loss and damage given that the future impacts of climate change are difficult to predict, and there are no existing estimates of the costs for advanced economies. Bottom-up country estimates by the World Bank's Country Climate and Development Reports (CCDR) covering 24 countries find average annual investment needs of around 1.4% of GDP over the period 2022–30 to build resilience and reduce emissions, albeit annual investment needs per country range from 1 to 10% of GDP and individual reports often only cover a limited number of sectors, meaning these estimates are on the conservative side (World Bank, 2022a).

- Vivid Economics (2021) estimates global investment of $2.6 trillion per year is needed from 2021–2025 and $4.5 trillion per year from 2026–2050 in the energy and land use sectors.
- Systemiq estimates for Stern et al. (2021) that investment needs for the net zero and climate-resilient global economy amount to up to $4 trillion per year between 2021 and 2030 in energy, agriculture, forestry and other land use (AFOLU), and adaptation and resilience.
- Estimates by Songwe et al. (2022), focused specifically on emerging market and developing countries other than China, and covering energy, natural capital, adaptation, resilience and loss and damage, suggest needs of $2–2.8 trillion per year by 2030 (see also Figure A3).

These estimates suggest that investment needs to be increased and sustained above pre-pandemic levels by at least 2% of GDP per year, and by at least 4–5% in emerging markets and developing countries other than China (Stern et al., 2021; Bhattacharya et al., 2022, Songwe et al., 2022). Yet less than $653 billion in annual climate investment was deployed in 2019/20 (CPI, 2022),[12] with a particular shortfall in adaptation finance, which is five to 10 times below current needs (UNEP, 2022).

Figure A3. Actual current climate investment and different estimated investment needs



Source: Authors

[12] Covering investment in transportation, energy systems, land use, water and waste, buildings and infrastructure, 'other' and cross-sectoral.

While an investment push is needed widely across economies, investment should be prioritized in several key areas:

1. **Transforming major emitting sectors,** particularly the energy sector, which is responsible for around three-quarters of greenhouse gas emissions today and therefore is at the heart of the transition to a net zero economy. Priorities for the decarbonization of the power system include a massive scale-up in zero carbon generation (to meet new energy demand, decarbonize existing power systems, and electrify final demand), investment in energy transmission, distribution and storage and backup capacity, and the acceleration of the coal phase-out. The decarbonization of energy end-use will require action on transportation, including building low-emission infrastructure and the electrification or conversion to hydrogen of all fleets. It also requires decarbonization of buildings and industrial processes.
2. **Strengthening adaptive capacity and building resilience, and financing loss and damage,** to respond to the growing vulnerability of countries—particularly developing countries—to climate change, both to more frequent and damaging extreme events and the effects of 'slow onset' events. Funding for mechanisms that deal with loss and damage are also required, including the Loss and Damage Fund agreed to at COP27.
3. **Protecting and restoring natural capital,** including through sustainable agriculture and land use practices, and conservation of biodiversity. Given nature's importance for both mitigation and adaptation, countries must urgently begin to restore the damage that has been done to natural capital in terms of degraded land, deforestation, and damage to water supply and oceans.
4. **Fostering a just transition,** which is needed for the successful and lasting transition to a net zero, resilient economy. A just transition ensures a fair and wide distribution of the benefits, and targeted support for those individuals, businesses, organizations and regions that may be adversely impacted, thereby reducing the risks of policy reversal. Investments will be needed in the form of targeted programs, to retrain workers for instance, and to build and expand social safety nets. (Songwe et al., 2022)

The different proportions of capital that will need to come from public, private, domestic and international sources will vary by country and by investment category. For instance, in most countries, the private sector is well-placed to undertake investments in renewables. Some estimates suggest that around 70% of investments in the energy and land-use sectors, which tend to have clear revenue streams, can be provided by the private sector (Vivid Economics, 2021). However, even in the energy sector, there is a need for complementary public investment in grid development, storage and back-up capacity. Other sectors, such as adaptation and resilience and loss and damage, and countries with less developed capital markets, provide a more challenging environment for private investment and will require governments to play a more active role. Governments must invest strategically in these critical areas, while ensuring that the right conditions are in place to crowd in private finance. Policy reform and de-risking throughout the investment cycle will be essential.

Mobilizing this investment push can be challenging, particularly in low- and middle-income countries, where fiscal space has been greatly reduced and debt distress is sometimes acute. And it will involve navigating (real and perceived) trade-offs and competing priorities, a subject dealt with in Part C. The key challenge is designing investments programs that cut across multiple priority areas and simultaneously enhance growth, debt-sustainability and creditworthiness while advancing both development and climate action (World Bank, 2023).

The good news is that there is sufficient global capital and liquidity to close these investment gaps (IPCC, 2023) and Ministries of Finance can have some grounds for optimism in relation to available fiscal space. While over-indebtedness or lack of solvency is a challenge for some Ministries of Finance, most countries are suffering from liquidity and roll-over problems that can be overcome with the right strategies (Songwe et al., 2022). Support from the international community, plus incentivizing private finance, will be essential (ibid.).

This agenda is not just about investing more, it is also about spending more wisely and shifting away from investments that lock in unsustainable development pathways. Substantial savings—typically not included in the scope of investment needs assessments—can be made through the shift to a low-carbon system. For instance, preliminary analysis suggests that the fall in fossil fuel investment would make $500 billion of capital available globally each year that could be reallocated toward the transition (Energy Transitions Commission, 2022).

As recognized for the first time at COP27, delivering this funding will require a transformation of the global financial system. Ministries of Finance will need to be at the heart of this effort. They have a key role to play in raising and redirecting public and private capital toward climate action through national strategies and investment plans, the right fiscal policies, and upgrading financial instruments. But also Ministries of Finance hold considerable leverage over key actors in the financial system, including central banks, commercial banks, national and multilateral development banks, and can encourage them to shift toward a financial system aligned to net zero.

Strengthening the role of Ministries of Finance: introducing a new framework for climate action

Ministries of Finance now need to strengthen their roles considerably to drive climate action at the pace and scale required. This will involve them playing a major role governing key aspects of economic, fiscal and financing policy to overcome the wide range of market and non-market failures that sit at the heart of the climate challenge and lead to underinvestment in the new economy. These include the negative externalities of emissions, but also market and non-market failures related to knowledge spillovers, infrastructure lock-in, network externalities, co-benefits, split incentives, information costs, and coordination problems (Stern, 2022). Playing this role will demand not only their significant involvement in the design of measures such as carbon pricing and subsidy reform but also in a wide range of complementary measures in packages of reinforcing economic, fiscal and financing measures to unlock the investment needed to meet the speed and scale of the challenge.

To guide Ministries of Finance in this task, Part B of the report presents a framework for action that is based on enhancing their core functions and capabilities. Before we detail the framework, in this section we summarize these functions and capabilities and their role in mainstreaming climate action, with brief examples of opportunities and international best practice.

Strengthening functions

To strengthen their roles, Ministries will need to mainstream climate action into key functional areas carried out as part of their core responsibilities. Core functions are those that routinely contribute to delivering these responsibilities and typically include macroeconomic strategy, fiscal policy and financial policy (including regulation and supervision of the financial sector). Seeing climate action as something 'new and additional' rather than integrating the agenda into the core business of Ministries is unlikely to be an effective approach. Instead, by taking a mainstreaming approach, they can help ensure climate action is synonymous with sound economic policy. Hence, these core functions act as 'key entry points' for mainstreaming climate action within the strategy and operations of Ministries of Finance, and act as the starting point for the framework.

Ministries of Finance can mainstream climate into their **three typical core functions:**

1. **Economic strategy and vision:** using their responsibility for oversight or involvement in national development strategies, sector plans and capital investment planning to participate in the development of national climate strategies, greening national development and sector plans, shaping industrial and innovation strategies, and assessing investment needs for the transition—in partnership with relevant line ministries.
2. **Fiscal policies and budget management:** using their primary responsibility for fiscal policy, taxation and budget planning and execution to design carbon pricing and new forms of environmental taxation, reform fossil fuel subsidies, introduce new fiscal incentives for green sectors, reform multi-annual expenditure frameworks and annual budgets, and green public investment and procurement strategies. Introducing a zero-carbon tax system and managing contingent liabilities will be critical. The Ministry of Finance's central role in the budget formulation process is a particularly important entry point for driving climate action and investment.
3. **Financial policy and regulation and oversight of the financial system:** using their core responsibility for the regulation of state-owned banks, enterprises, sovereign wealth funds, financial institutions and debt markets, interfaces with central banks, and shareholdings and relationships with the international finance institutions (IFIs) and multilateral development banks (MDBs) to green the entire financial system and mobilize finance into sustainable investments. This can be achieved through frameworks for green bonds, catalyzing private capital, adaptation and disaster risk finance and insurance, and international climate finance —in partnership with central banks and the private sector.

Table A1 provides an overview of these key opportunities, which are then detailed further in Part B.

Table A1. Core Ministry of Finance functions and opportunities to mainstream climate action

Thematic area	Core Ministry of Finance functions	Opportunities for mainstreaming climate action
Economic strategy [Function 1]	• Oversight of national development and structural reform planning* • Oversight of sector plans* • Macro-fiscal forecasting* • Capital investment planning*	• Participating in the development of national climate strategies (Long-Term Strategies, Nationally Determined Contributions, National Adaptation Plans) • Greening national development and sector strategies • Shaping innovation and industrial strategies • Developing investment strategies for the net zero, climate-resilient transition, including through identifying and developing bankable projects and programs
Fiscal policy [Function 2] *Tax and debt management*	• Fiscal policy analysis, formulation and fiscal rules • Policy on taxation and other government revenues • Policy on sectoral fiscal incentives • Policy on management of fiscal risks, guarantees and contingent liabilities • Debt management strategy	• Carbon taxes and pricing, subsidy reform, other forms of environmental taxation • Fiscal incentives and regulations for catalyzing green sectors • Future proofing the public finances through tax reform to identify long-term alternative revenues to taxing fossil fuels, broadening the tax base and managing the fiscal risks of contingent liabilities
Budget management	• Formulation of multi-annual expenditure frameworks and annual budgets (including costings) • Public investment strategy and policies* • Policies on public procurement • Accounting policies and guidelines • Implementation of global standards for tracking revenues and expenditures	• Mainstreaming climate action within multi-annual expenditure frameworks and annual budgets (including green budget tagging and disaster risk assessments) • Greening public investment strategy • Greening public procurement • Reforming national accounting approaches
Financial policy and regulation and oversight of financial system [Function 3]	• Policies on inter-governmental fiscal relations and financial transfers • Regulation of debt markets • Policies on the management and regulation of state-owned banks, enterprises and sovereign wealth funds • Remit-setting for the central bank (where applicable)* • Regulation of financial institutions* • Management and regulation of other government assets and liabilities • Managing shareholdings and relationships with IFIs, MDBs, international organizations	• Domestic resource mobilization including frameworks for debt financing, sovereign green and other thematic bonds, and sub-national finance for climate action • Greening publicly backed financial institutions and central banks (including national development banks, sovereign wealth funds, and state-owned enterprises) • Catalyzing private capital through greening the financial system (including climate performance standards and disclosure requirements), innovations in financing models (including blended finance), and sustainable finance roadmaps • Disaster risk finance and insurance • Leveraging international climate finance (including by getting 'climate finance' ready, accessing international carbon markets, and country platforms) • International coordination on the global financial architecture

***Note and source**: *Areas most often shared with independent agencies or other agencies, as per Allen et al. (2015, 2016). Adapted from Allen at al. (2015, 2016), which summarizes the core policy, regulation and transactional functional areas covered by most Ministries of Finance, updated here to identify key 'entry points' for mainstreaming climate action.*

Enhanced action by Ministries of Finance will require that they work hand-in-hand with other line ministries and actors across these functional areas. While Ministries of Finance need to be proactive in their areas of direct responsibility, in certain areas it is important that they enable and support the leadership of line ministries and other actors, including through the power of the budget. Similarly, they will need to co-lead or share responsibility in other areas. Table A2 provides a snapshot of the typical splits of responsibility that can be considered. (See Appendix 1 for a more detailed overview.)

Table A2. The role of Ministries of Finance in climate action across core functional areas in relation to other actors

Primary authority or influence of Ministries of Finance to accelerate action	Supporting actions by line ministries and other actors, including through the budget
• Mainstreaming climate action within multi-annual expenditure frameworks and annual budgets (incl. green budget tagging) • Greening public investment strategy • Greening public procurement • Carbon taxes and pricing, subsidy reform, and other forms of environmental taxation • Domestic resource mobilization and future proofing the public finances through tax reform to identify long-term alternative revenues to taxing fossil fuels, broadening the tax base and managing the fiscal risks of contingent liabilities • Disaster risk financing and insurance (incl. through establishing national disaster reconstruction and recovery funds)	• Sustainable and resilient infrastructure provision (energy, transportation, buildings, water, waste) • National electric charging infrastructure • Vehicle and fuel efficiency standards • National grid upgrades to integrate renewables • Building and utility performance standards • Retrofit and energy efficiency programs • Extension services for agriculture • National forest protection programs • R&D for innovation • Retraining, regeneration, social protection schemes • Disaster risk warning system
Co-leadership or shared responsibility with line ministries and other actors	
• Shaping national climate strategies (Long-Term Strategies, Nationally Determined Contributions, National Adaptation Plans) • Greening national development, sector strategies, and industrial/innovation strategies • Developing investment strategies incl. by assessing investment needs for the net zero, climate-resilient transition, e.g. through identifying and developing bankable projects and programs • Fiscal incentives and regulation for transforming key sectors such as energy, transportation, buildings, and forest protection • Reforms to regional and local fiscal powers to facilitate climate action and investment • Greening the financial sector (incl. developing climate performance standards and disclosure requirements) • Innovations in financing approaches (incl. blended finance) and sustainable finance roadmaps • Reforming remits and responsibilities of central banks, national development banks, sovereign wealth funds, and SOEs (where main shareholder) • Establishing frameworks for debt financing and green and other thematic sovereign bonds • Financial and insurance products for enhancing resilience • Leveraging international climate finance (incl. by getting 'climate finance ready', accessing voluntary carbon markets, and country platforms)	

Source: Authors

Strengthening capabilities

To strengthen their core functions to act on climate, Ministries of Finance will also need to strengthen their capabilities to act. Core capabilities are those that impact the ability of Ministries of Finance to fulfill their core functions. Capability is about more than capacity and the volume of people, money and other inputs—it is about translating inputs into outputs and outcomes through sustained leadership, clarifying roles and responsibilities internally and within other government departments, strong internal coordination and information-sharing, and strengthening skills and human resources (ODI, 2016; World Bank, 2013).

Interviews for this report demonstrate that Ministries of Finance often know 'what' strategies and policies are needed but do not know 'how' to design and implement them, due to gaps in leadership, coordination, staffing and technical capabilities to act.

Three capabilities are of particular importance:

1. **Leadership capability:** strengthening the range of champions for climate action at the political and officials level, strengthening the Ministry's vision, mission and mandate to drive climate action, and creating clear responsibilities and organizational structures for climate leadership.
2. **Coordination capability:** driving effective collaboration across government and with the private sector, civil society and international financial institutions, supported by effective strategies for consultation and communication.
3. **Human and analytical capability:** ensuring dedicated staffing resources for climate action, upgrading expertise in climate policy, and revamping tools and analytical approaches for data collection and economic decision-making.

Table A3 provides an overview of these areas, which are detailed further in Part B.

In many cases, Ministries of Finance will need to overcome acute gaps in their capabilities to act on climate to overcome challenges and barriers that typically hamper their more active engagement in the climate agenda and their ability to deliver on the core functions outlined above. Rather than primarily technological or economic, the key barriers to a clean future are political, institutional and behavioral.

Common barriers that can be found across all regions and income levels include:

- **Limited awareness and willingness** within Ministries of Finance to engage on climate change issues. This includes limited awareness of the actions needed and their costs and benefits, compounded by the perception that climate action is an environmental, rather than economic, issue that belongs under the purview of environment or dedicated climate change ministries.
- **Lack of strategic vision** of the required changes and the opportunities and risks associated with the transformation, and consequently decision-making frequently based on short-term horizons and an aversion to long-term planning for the transition.
- **Weak institutional basis** for involvement in the government's climate agenda, including a lack of explicit mandates formalizing Ministries' role in driving climate action, and a lack of flexibility to respond to major challenges.
- **Lack of vertical and horizontal coordination within government,** including heads of government, key line ministries and sub-national actors, and a competitive rather than cooperative attitude, leading to working in silos.
- **A lack of cross-sectoral thinking,** due to Ministries of Finance traditionally being organized along sectoral lines.
- **Limited expertise and technical capacity,** including a limited number of staff with climate-specific expertise, access to and ability to use relevant tools and models.

- **Conservative economic thinking** related to a perceived strong trade-off between climate action and economic development; and a hesitancy to make active use of fiscal policy and tax incentives, earmarking of tax revenues, green taxes or non-market mechanisms to drive climate action.
- **A natural skepticism toward new spending commitments,** connected to the Ministries of Finance's role in the budget process.
- **Preoccupation with current macroeconomic challenges,** without sufficient attention paid to the connections between climate action and tackling current macroeconomic crises.

Sources: Coalition of Finance Ministers for Climate Action (2022d); Mikheeva and Ryan-Collins (2022); Orozco and Jaramillo (2021); interviews for this report.

In many cases, Ministries of Finance will need to address acute gaps in their capabilities to act on climate, so they can overcome challenges and barriers that typically hamper their more active engagement in the climate agenda.

Table A3. Core Ministry of Finance capabilities and opportunities to mainstream climate action

Thematic area	Core Ministry of Finance functions	Opportunities for mainstreaming climate action
Leadership [Capability 1]	Ministry mandate, strategy and senior leadership	• Strengthening champions at senior and official level to drive climate mainstreaming • Strengthening mandate reflecting Ministry of Finance role in driving climate action • Strategy, vision and mission incorporating climate action • Clear responsibilities and organizational structure for climate action, e.g. through climate unit
Coordination [Capability 2]	Processes for coordination and collaboration	• Processes for driving effective collaboration on climate action with other public agencies, private sector, civil society, MDBs, the global financial architecture, other actors • Effective communication strategies for consultation and communication around climate policies
Human and analytical [Capability 3]	Staffing structure and skills, and tools for economic decision-making	• Dedicated staffing resources responsible for mainstreaming climate • Generalist and specialist staff with relevant expertise and skills in climate action • Climate mainstreamed into tools and analytical approaches for data collection and economic decision-making • Alternative metrics of prosperity

Sources/notes: *Various including World Bank (2013), which looked at internal capabilities of Central Finance Agencies (CFAs), and ODI (2016), which divides CFA capabilities into analytical, delivery, coordinative, and regulatory functions. The regulatory function is built into the core functions in this case. Leadership is not explicitly included in ODI (2016).*

Recognizing existing good practice

Within the discussion of the framework in Part B, the report highlights the many examples of visionary leadership by both members and non-members of the Coalition across the core functions and capabilities. A snapshot of these is provided in Tables A4 and A5 below. Bold text indicates detailed case studies provided in Part B.

Table A4. Examples of good practice by Ministries of Finance (or national equivalents) in the core functions

Action area	Country examples
Function 1: Reforming economic strategy through shaping national plans and transition strategies (Helsinki Principles 1 and 6)	
Long-Term Strategies (LTSs) (p. 52)	• UK Treasury launched Net Zero Review • Burkina Faso Ministry of Finance (MoF) involved across all stages of LTS process • Fiji's Ministry of Finance, Strategic Planning, National Planning & Development (Ministry of Economy) leading LTS development • MoFs in Chile, Costa Rica and Ethiopia supporting LTS development • North Macedonia and Cambodia LTS assessing implications on domestic economy
Nationally Determined Contributions (NDCs) (p. 55)	• Rwanda Ministry of Finance and Economic Planning (MINECOFIN) leading on NDC revision • Sudan Ministry of Finance and Economic Planning (MOFEP) a focal point in NDC implementation • Norway MoF responsible for NDC economic measures • MoFs in Chile, Norway and Uruguay supporting NDC development
National Adaptation Plans (NAPs) (p. 57)	• Fiji Ministry of Economy costing the NAP • Togo Ministry of Economy, Finance and Development Planning (MOEFDP) aligning the NAP process with national budget planning
National development strategies (p. 63)	• Uganda Ministry of Finance, Planning and Economic Development (MOFPED)'s National Development Plan and Green Growth Strategy • Nigeria MoF leading the National Development Plan • Ireland revising its National Development Plan • Mexico MoF aligning national planning with 2030 Agenda and Sustainable Development Goals (SDGs) • France MoF coordinating sectoral decarbonization strategies • Bangladesh and Morocco developing plans for sector decarbonization
Industrial and innovation strategies (p. 70)	• Morocco's green industrialization strategy • India launching photovoltaics program • US Inflation Reduction Act • Japan and Ethiopia launching Green Growth Strategies with industrial policy elements
Investment strategies and needs assessment (p. 76)	• **Rwanda MINECOFIN driving climate action and investment** (p.78) • Saint Kitts and Nevis assessing investment barriers as part of NDC • Spain's National Energy and Climate Plan, co-developed by the Ministry of Finance • Cambodia and Costa Rica assessing long-term investment needs • Finland MoF part of cross-ministerial green transition finance working group
Project pipelines and prioritization (p. 83)	• Kiribati's NDC Investment Plan including a project pipeline • São Tomé and Príncipe developing a project roadmap • Indonesia, Colombia, UK and Mexico establishing entities to speed up investment
Function 2: Reforming fiscal policies (Helsinki Principles 3 and 4)	
Economic incentives and fiscal policy (p. 91)	• MoFs in Canada, EU, Chile, Ireland and Denmark introducing carbon pricing • MoFs in Indonesia and India reforming fossil fuel subsidies • Sweden MoF introducing revenue-generating policy instruments • **Uruguay MoF role in driving energy sector transformation in Uruguay** (p.96) • Germany, Ethiopia, Iceland and Belgium MoFs introducing tax incentives for EVs and retrofitting (p.95)
Smart policy packages (p. 97)	• Chile MoF introducing an integrated Green Finance Strategy • Costa Rica linking different environmental taxes • EU's Fit for 55 Package • Germany, India and UK using smart policy packages
Future-proofing public finances (p. 102)	• Costa Rica MoF leading introduction of green tax reform • Switzerland introduction of road user charging • US states and cities piloting road use charges as substitutes for fuel tax

Action area	Country examples
Managing fiscal risks (p. 105)	• Bahamas MoF identifying climate infrastructure investment opportunities • Barbados introducing a disaster risk clause into loan agreements
Expenditure and budget frameworks (p. 103)	• France MoF preparing a Green Budget • Nepal MoF including a Climate Budget • Canada's Strategic Environment Assessment for policy and program proposals
Greening public investment management (p. 118)	• Mexico MoF developing sustainability indicators for public investments • Ethiopia's public investment management guidelines, co-developed by the MoF • Chile's methodology for assessing disaster risk in public infrastructure projects • Costa Rica's disaster risk analysis in National Public Investment System
Green procurement (p. 121)	• Costa Rica introducing green public procurement law
Function 3: Reforming financial policy and the financial system to raise, steer and blend finance (Helsinki Principle 5)	
Broadening the tax base (p. 124)	• Rwanda Revenue Authority under MoF implementing reforms to tax collection
Debt financing, including through green and other thematic bonds (p. 127)	• MoFs in Poland, Fiji, Italy, France and Singapore issuing green bonds • Chile and Uruguay MoFs issuing a sovereign sustainability-linked bond • Mexico MoF issuing SDG-linked bonds, Seychelles launching a blue bond and Indonesia issuing a 'green sukuk' • European Bank for Reconstruction and Development launching a climate resilience bond • EU suspending fiscal rules to provide a fiscal response to COVID-19 • Belize signing a debt-for-climate swap
Sub-sovereign finance (p. 131)	• UK Treasury and City of London's use of land-based financing • Uganda MOFPED improving tax administration and collection • Johannesburg and Mexico City issuing green bonds
Greening national development banks (NDBs) and green investment banks (GIBs) (p. 134)	• Germany's KfW, France's AFD and Colombia's Bancoldex providing financing for low-carbon, climate-resilient projects • European Investment Bank publishing a Climate Roadmap • Netherlands MoF greening export credit insurances
Leveraging sovereign wealth funds and state-owned enterprises (p. 137)	• Norway greening the Government Pension Fund Global with support of MoF • Italy MoF mandating CDP Green, Social and Sustainability Bond Framework • New Zealand MoF issuing investment framework for Superannuation Fund
Reforming central bank activities (p. 140)	• UK Treasury changing the remit of Bank of England's Monetary and Financial Policy Committees • EU debating the European Central Bank mandate
Greening the financial sector (p. 145)	• Netherlands national climate and energy plan (NCEP) financial sector commitments • French financial institutions committing to coal exit strategies to Minister of the Economy and Finance • Indonesia launching a green taxonomy • Luxembourg launching Sustainable Finance Initiative • MoF Mexico launching Sustainable Taxonomy • Poland combining capital market development with sustainable finance
Innovations in financial models (p. 150)	• MoF Indonesia embracing blended finance • EU launching External Investment Plan • Finland launching Blended Finance for Climate Program • Germany and Luxembourg launching initiatives to raise climate finance
Green finance roadmaps (p. 145)	• MoF Germany co-developing a sustainable finance roadmap
Disaster risk finance and insurance for all (p. 156)	• **Jamaican MoF participating in developing a disaster risk financing strategy** (p.157) • Four Pacific Alliance countries launching a catastrophe bond • Caribbean Catastrophe Risk Insurance Facility • Mexico MoF disaster risk management processes
Leveraging multilateral development bank (MDB) and development finance institution (DFI) capital (p. 162)	• Brazilian Development Bank (BNDES) financing green development projects • Mexico's Nacional Financiera (NAFIN) supporting international climate finance projects • Rwanda Green Fund (FONERWA) as a vehicle for climate finance

Action area	Country examples
Accessing international capital markets (p. 164)	• African Carbon Markets Initiative launched at COP27 • Guyana, Peru, Nepal and Cambodia issuing, or preparing to issue, carbon credits
Country platforms (p. 165)	• South Africa launching International Just Energy Transition Partnership
Cross-cutting: Just transition	
Ensuring a just transition (p. 170)	• **Ireland MoF using carbon taxation revenues to support a just transition** (p.171) • Canada's Just Transition Task Force mitigating social impacts of transition • Spain's just transition agreements for climate-affected regions • EU launching a just transition mechanism

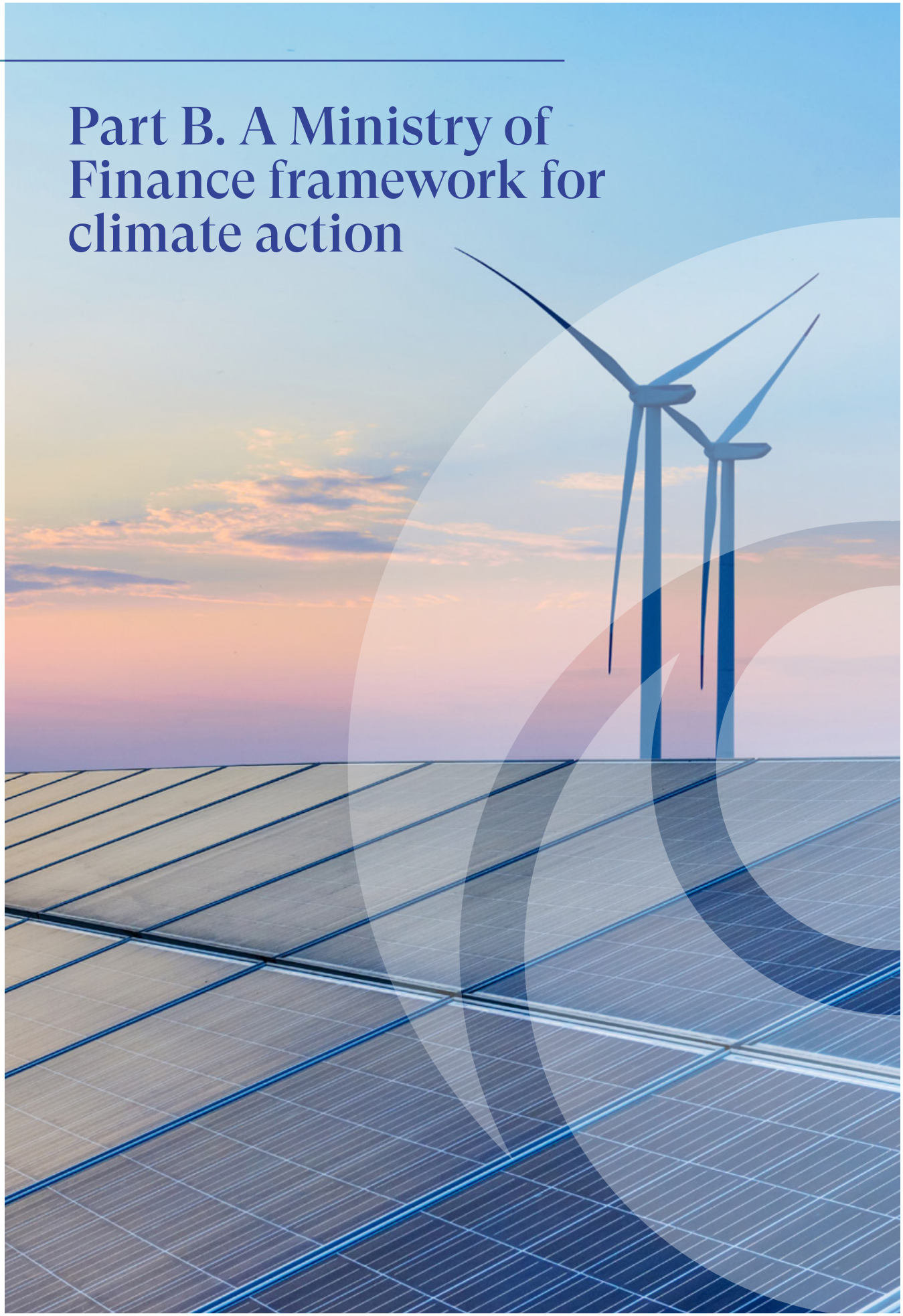
Note: Not all the initiatives named necessarily have MoF involvement but they can serve as examples for MoFs for types of strategies they can develop or support. Use the bookmarks to find these examples in Part B. Bold indicates a detailed case study.

Table A5. Examples of good practice by Ministries of Finance (or national equivalents) in the core functions

Action area	Country examples
Capability 1: Leadership and governance (Helsinki Principle 2)	
Revamping MoF mandate on climate change (p. 177)	• **Denmark MoF's update of its mission statement** (p.185) • Ireland, Bahamas, Malaysia, Peru and Uruguay clarifying their MoFs' mandates
Developing internal MoF strategies on climate change (p. 179)	• US Treasury Strategic Plan includes 'Sustainable Treasury Operations' • Ireland, New Zealand and Finland MoFs integrating climate into their ministerial strategy • Chile and the US Treasury publishing climate strategies • Finland MoF's new climate and nature strategy
Enhancing governance and organizational set-up (p. 181)	• **Denmark's MoF setting up a Centre for Climate, Green Economy and the EU** (p.182) • **Fiji Ministry of Economy setting up a Climate Change and International Cooperation Division** (p.183) • Ireland, India, Chile Uganda, Peru and UK MoFs setting up dedicated units • **US Treasury creating a Climate Hub** (p.186)
Capability 2: Coordination and collaboration (Helsinki Principles 2 and 4)	
Improving collaboration and coordination (p. 192)	• US, Uganda, Uruguay and Singapore MoFs involved in inter-agency coordination mechanisms • **Uganda MoF's role in coordination of climate response** (p.193) • France creating the General Secretariat for Ecological Planning • Greece, Uruguay and Egypt MoFs collaborating on strategic initiatives • **Denmark MoF's role in coordinating climate policy** (p.196) • Ireland, France and Uruguay MoFs coordinating with external stakeholders • **Chile MoF creating the public–private green finance roundtable** (p.197)
Capability 3: Human capacity, expertise and economic decision-making (Helsinki Principles 2 and 4)	
Upgrading skills and expertise (p. 203)	• **European Commission supporting implementation of green budgeting among EU members** (p.206) • **Inter-American Development Bank providing support on green fiscal policies** (p.206) • Denmark MoF and US Treasury providing training on climate • Nordic Council of Ministers develop and research modeling • Ireland, Korea and UK MoFs collaborating with external experts
Enhancing analytical capability (p. 212)	• MoFs in Chile, UK and Finland assessing climate impacts • Denmark's GreenREFORM Model developed with MoF support

Note: Use the bookmarks to find these examples in Part B. Bold indicates a detailed case study.

Part B. A Ministry of Finance framework for climate action



This part of the report presents a practical framework that Ministries of Finance can follow to mainstream climate action into their operations and drive the shift toward a zero carbon, climate-resilient future.

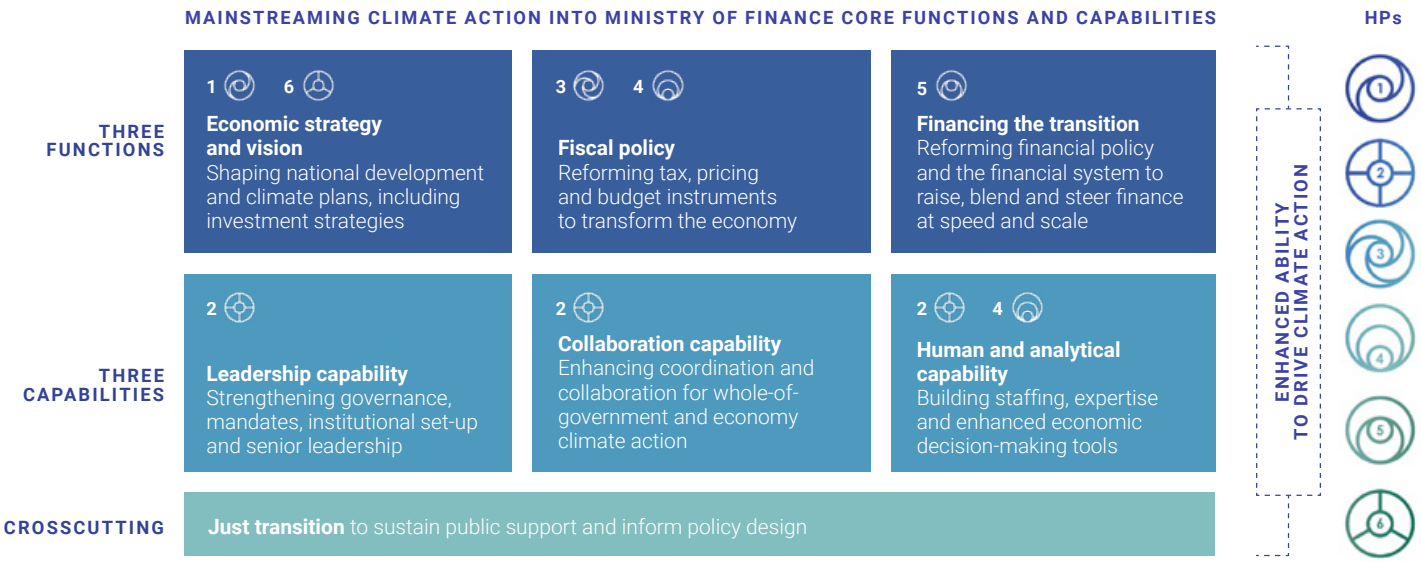
Read this to:

- Explore how to build core functions and capabilities to act on climate
- Understand how to take action and overcome barriers across a series of action areas
- Find out more about the steps Ministries of Finance are already taking around the world

Overview of the framework

The following framework for mainstreaming climate action, summarized in Figure B1, is organized around the three 'core functions' and three 'core capabilities' of Ministries of Finance outlined in Part A above. Each of the functions and capabilities is broken down into further detailed action areas, as summarized beneath the figure.[13]

Figure B1. A Ministry of Finance framework for climate action



Source: Authors

The Helsinki Principles (HPs) are outlined on p.47 below

The three functions that can be enhanced for Ministries of Finance to mainstream climate, and the Helsinki Principles (HPs) they align with, are:

Function 1: Economic strategy and vision (HPs 1 and 6)

Reforming economic strategy through shaping national development and climate plans, including investment strategies for sustainable, inclusive and resilient growth, in partnership with others:

- **Shaping national climate and development strategies**
  - 1a: Participating in the development and implementation of climate strategies, including Long-Term Strategies, Nationally Determined Contributions and National Adaptation Plans
  - 1b: Greening national development and sector strategies
  - 1c: Shaping 21st century industrial and innovation strategies
- **Shaping investment strategies**
  - 1d: Developing investment strategies including by assessing investment needs
  - 1e: Identifying and developing bankable projects and programs

[13] Note that the full detailed framework, showing all of its sub-functions and topics, is presented on p6 of the guide's Contents.

Function 2: Fiscal policy (HPs 3 and 4)

Reforming fiscal policies through reforming tax systems, macroeconomic incentives and mainstreaming climate in the budget:

- **Reforming tax systems and macroeconomic incentives**
  - 2a: Transforming macroeconomic incentives through carbon pricing, subsidy reform and other fiscal policy measures and combining instruments into smart policy packages
  - 2b: Future-proofing public finances by redesigning the tax system for net zero and climate resilience, including by identifying alternative revenue streams and managing fiscal risks of cascading contingent liabilities
- **Mainstreaming climate in the budget**
  - 2c: Using the budget to drive transformation in all sectors of the economy, including through annual budgets and medium-term expenditure frameworks
  - 2d: Greening public investment management
  - 2e: Greening public procurement

Function 3: Financing the transition (HP 5)

- 3a: Mobilizing domestic revenue to finance investment, including through debt financing, sovereign green and other thematic bonds, and enhancing sub-sovereign finance
- 3b: Greening publicly backed financial institutions, including sovereign wealth funds, state-owned enterprises and central banks
- 3c: Accessing deep pockets of private capital to finance the transition, including by greening the financial sector, driving innovation in financing models and developing sustainable finance roadmaps
- 3d: Providing disaster risk financing and insurance for all
- 3e: Leveraging international climate finance and the global financial architecture, including by leveraging MDB and DFI capital, accessing international carbon markets and setting up country platforms

The three capabilities Ministries of Finance can develop to play a more active role in climate action, and the Helsinki Principles they align with, are:

Capability 1: Leadership capability (HP2)

Strengthening leadership for climate action through a revamped vision, mission, mandate and institutional set-up for climate action to provide strategic clarity on the direction of travel:

- 1a: Strengthening the mandate of Ministries of Finance
- 1b: Developing organizational climate strategies
- 1c: Formalizing governance structures and organizational set-up

Capability 2: Collaboration capability (HP2)

Enhancing collaboration and coordination within and outside government for a whole-of-economy approach to climate action.

Capability 3: Human and analytical capacity (HPs 2 and 4)

Building human capacity, expertise and economic decision-making tools for climate action:

- 3a: Enhancing skills and expertise of ministerial staff
- 3b: Enhancing economic decision-making tools and data-driven analysis to inform decision-making

Crosscutting issue

The critical need for Ministries of Finance to drive forward a just transition to sustain public support and inform effective policy design is a particularly important crosscutting issue.

The six Helsinki Principles that guide the Coalition's commitment to climate action

1. Align policies with the Paris Agreement
2. Share experiences and expertise
3. Promote carbon pricing measures
4. Mainstream climate in economic policies
5. Mobilize climate finance
6. Engage in NDC development

Find out more: ***www.financeministersforclimate.org***

Navigating and using the framework

The remainder of Part B outlines a wide range of opportunities for action that can be considered by Ministries of Finance, within the structure of the framework.

Each action area covers five themes:

- The critical role of the Ministry of Finance in the area at hand
- Typical barriers to action and strategies to overcome them
- Real world examples and case studies from Coalition members and other countries
- Opportunities for action and ways forward for Ministries of Finance

To help you navigate the framework, the overview plus functions and capabilities are bookmarked at the top of each page.

It is important for readers to keep in mind three issues when navigating the guide:

1. **The need to collaborate and enable the leadership of other line ministries.** Ministries of Finance do not typically lead on the development of national climate strategies or investment strategies (Function 1): they develop these in partnership with other line ministries, whom they support in their implementation. Ministries of Finance therefore need to have strong involvement in these processes and strengthen their collaboration with other government actors, including by enabling their leadership. This contrasts with the primary responsibility they typically have for the budget, fiscal and financing policy (Functions 2 and 3). Despite these differences, shaping climate strategies and investment planning is set out as the first function, as without the active participation of Ministries of Finance in this 'upstream' area, it is challenging for them to know (and buy into) what overall national objectives need to be delivered through fiscal and financing policy 'downstream'. Not having this knowledge could undermine ambition and implementation.
2. **The need to consider the inextricable links between all the functions and capabilities.** Strengthening one but not another risks not generating discernible or enduring benefits. A Ministry might invest in developing a strong green budget tagging tool, but without an overall strategy for reviewing and reallocating the budget to support climate outcomes, this is unlikely to have much benefit. Alternatively, a Ministry may have the upfront capacity to develop a new analytical tool but not the in-house skills to maintain or upgrade it over time.

This underscores the need to consider undertaking a comprehensive review of their core functions and capabilities while being mindful of the need to focus resources in the areas likely to yield the most significant impacts. This issue is discussed further in Part C.

3. **The need for each Ministry of Finance to prioritize and sequence the steps it takes and consider its own unique operational context.** Important differences exist across countries in the mandates, structures, capacity, cultures and enabling environment and so a 'one size fits all' approach to climate policy and organizational reform will not work. Ministries of Finance will need to use this framework to identify the opportunities for action that are most relevant to them. Further guidance on prioritization is provided in Part C.

The expected outcome from applying this framework will be an enhanced ability to drive climate action through mainstreaming climate policy within Ministry core functions and capabilities.

The impact will be accelerated climate action and investment at scale nationwide, which will deliver a wide range of domestic and global economic, social and environmental outcomes.

A key objective of the framework is to encourage Ministries of Finance to develop smart packages of mutually reinforcing strategies, investment plans, policies and financing measures, to take advantage of the interactions between measures.

Function 1. Reforming economic strategy through shaping national development and climate plans

Helsinki Principles 1 and 6

Function 1 focuses on how Ministries of Finance can contribute to ambitious national climate strategies and then embed these at the heart of national development plans and investment strategies to drive the transition to net zero, resilient economies, working closely with Ministries of Environment, Planning, and other relevant line ministries.

It contains five action areas divided across 1) shaping national climate and development strategies (Functions 1a–c), and 2) shaping investment strategies (Functions 1d and e).

1. Shaping national climate and development strategies

Most governments still have a long way to go to embed climate action within national development priorities, and to see climate action as the key driver of economic growth and prosperity that it is. The insufficient policies and financial resources outlined in the latest NDCs, and the limited attempt to 'green' the recovery from COVID-19, indicate a lack of integration between climate and national development priorities.

Ministries of Finance need to play a driving role in placing climate action at the heart of national development priorities through active participation in the development of national climate strategies, and integrating climate action into national development plans. Other ministries may play a leading role in developing these plans, but Ministries of Finance will be critical to supporting the costing of policies and measures, designing policies to deliver on their objectives, determining what gets resourced, and ensuring coherence across government and with other key stakeholders.

Proactive engagement by Ministries of Finance can help bridge knowledge gaps on the economic case for climate action while maximizing the synergies and reducing trade-offs between climate and development. Working closely with the respective lead agency, typically Ministries of Environment, Ministries of Finance can ensure that climate plans are backed by clear investment strategies, that investment is unlocked by supporting macro, fiscal and other polices, and that it can then be financed through a mix of public, private and other sources of capital.

Function 1a. Participating in the development and implementation of climate strategies[14]

Introduction

Long-Term Strategies (LTSs), Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) are key national climate planning instruments. With Ministry of Finance involvement, they can also be excellent tools to help them identify investment priorities, budget risks and opportunities, and other ways to integrate climate action into their day-to-day activities.

[14] This section is partially based on contributions from Marcela Jaramillo (2050 Pathways) and Joaquim Leite (NDC Partnership).

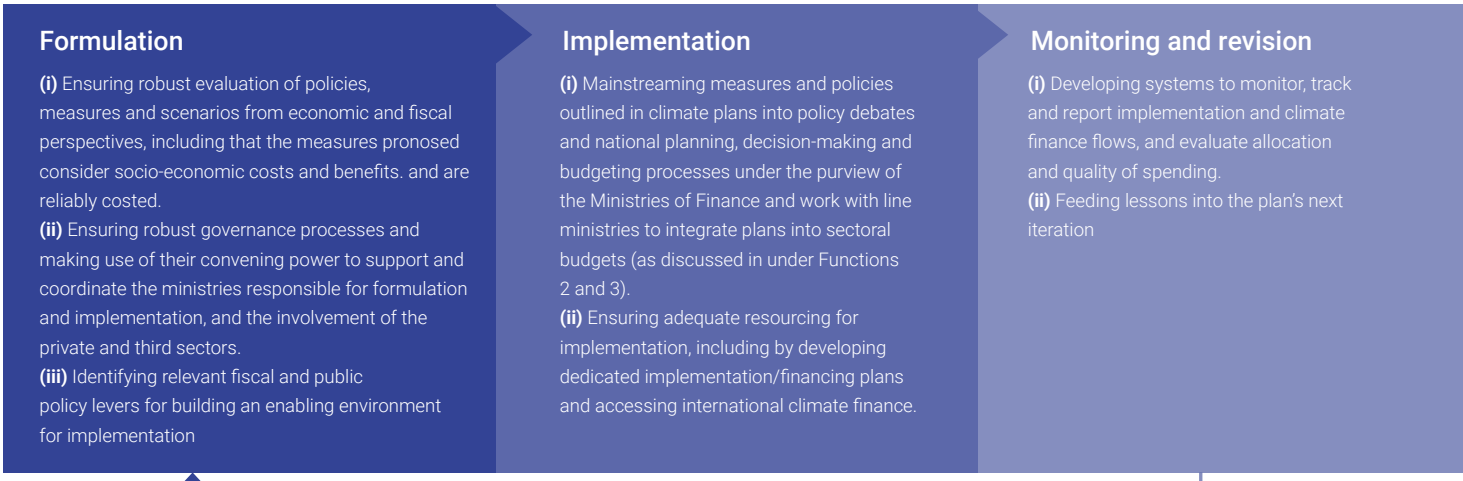
Ministries of Finance need to systematically engage more with these national planning processes so they can ensure that plans address macroeconomic and finance-related issues, and costs are adequately assessed and their wider financial implications considered, including through their integration into wider budget management processes. Engagement also helps to improve their understanding of the risks and opportunities of climate action and how these relate to Ministry of Finance core objectives. International experience suggests that the centralized offices of state, Ministries of Finance among them, have to play a key role in helping to coordinate sector ministries and other state agencies in implementing strategies of this breadth (Elliott et al., 2019). They can also ensure the involvement of a range of external stakeholders such as the private sector, farmers, young people, women, civil society, academia and the media.

There is now a major opportunity for Ministries of Finance to step up their leadership, including by more actively supporting other government agencies in charge of climate. When surveyed in 2021, less than half of the members of the Coalition of Finance Ministries had completed a cost assessment of measures in their LTS or conducted cost–benefit analyses of the policy options. And while 12% of Coalition members stated they oversee the LTS process—often in collaboration with other ministries—15% said they were not involved at all (Coalition of Finance Ministers for Climate Action, 2020a). There is relatively limited evidence that Ministries of Finance have comprehensively assessed the risks or investment needs associated with delivering LTSs or considered how to finance these investments (2050 Pathways Platform, 2022). Similarly, only 11% of members have no engagement at all in NDC formulation, validation or implementation processes, and only around a quarter (28%) are actively involved in all three stages (Coalition of Finance Ministers for Climate Action, 2020b).

Despite their different timeframes and purposes, LTSs, NDCs and NAPs are deeply interconnected, though in practice they are not always aligned. Without a strong nearer-term commitment to reducing emissions, increasing adaptive capacity and building resilience, it is less likely a longer-term pathway will be deliverable, due to the lock-in impacts of long-lived infrastructure. Equally, without a long-term signal and certainty around the direction of travel it will be far more challenging to galvanize near-term action at the pace required and leverage investment for the transformation. Yet, in most cases governments are prioritizing NDCs over LTSs, and current NDCs are failing to add up to the long-term targets set out in LTSs (UNFCCC, 2022a). This is leading to a misalignment between NDCs and the long-term targets. There is thus a need for Ministries of Finance to connect these instruments to ensure LTS formulation translates long-term objectives into near-term action on NDCs.

Ministries of Finance can play a range of similar roles across LTSs, NDCs and NAPs, cutting across three key stages that should feature in the development of these instruments (see Figure B2). In addition, Ministries of Finance can take steps to involve the private sector in climate strategy processes and ensure integration between LTSs, NDCs and NAPs.

Figure B2. Role of Ministries of Finance in three key stages of LTSs, NDCs and NAPs



Source: Authors

The remainder of this section discusses the three planning instruments and the role of Ministries of Finance in more detail, before discussing joint barriers, ways to overcome them and opportunities for action. The instruments are discussed in the following order:

i. Long-term low emission development strategies
ii. Nationally Determined Contributions
iii. National Adaptation Plans

i) Long-term low emission development strategies (LTSs)

Context and role of Ministries of Finance

Achieving net zero emissions requires transformations in all sectors of the economy: this will require countries to develop and finance long-term low emission development strategies (LTSs). LTSs are encouraged under the Paris Agreement and their importance further stressed in the Glasgow Climate Pact adopted at COP26 in 2021, which urged countries to develop LTSs for net zero that are updated regularly and used to inform NDCs.

Formulating an LTS offers governments and Ministries of Finance a tool to plan and forge consensus on a roadmap to a net zero and climate-resilient economy. Ministries of Finance can find value in using LTSs as planning tools that help to clarify the actions needed in the medium and short as well as the long term across the economy, help leverage government policy to capture the economic benefits of a green economy, anticipate and manage the possible trade-offs of the transition, and clarify the investment options that need to be scaled up or phased out for an economically beneficial, just and inclusive transition (Coalition of Finance Ministers for Climate Action, 2020a). They can ensure that these strategies provide certainty for investors and companies, increasing their confidence to allocate capital toward the transition and implement their own net zero strategies.

Leadership and engagement from the Ministries of Finance in the LTS formulation process, in support of the lead agency and other involved ministries, is essential. This can help to ensure the full economic benefits of decarbonization are realized, that the proposed measures are costed and can be financed, that economic trade-offs can be identified and anticipated, and that decarbonization acts as an accelerator of national development. Ministries of Finance can contribute to assuring consistency and synergy between LTSs and broader public planning processes. This can provide certainty to the public and clear signals to the private sector that the government is committed to transition to a net zero economy—critical to closing the implementation gap with national climate plans. Additionally, inputs by experts from within Ministries of Finance throughout the LTS design process will be essential to foster understanding of the direct implications for fiscal policy and investment options linked to the transition, facilitating early identification of solutions that can increase the feasibility for delivery and readiness to manage economic risks that otherwise might have been overlooked.

Engagement in the LTS process can improve Ministries' understanding in five key areas:

- **The macroeconomic opportunities and risks from physical and transition impacts.** As well as identifying core climate risk impact channels, Ministries of Finance can use the LTS process to systematically quantify the possible longer-term impacts of decarbonization and enhance climate resilience on key macro-fiscal indicators such as GDP, employment, inflation, the current account, tax revenues and the debt-to-GDP ratio (see also Function 2). For example, as part of developing its LTS, work by the Planning Ministry with the Ministry of Finance in **Indonesia** found that delivering low-carbon growth will generate 15.3 million additional jobs in 2045 and reduce extreme poverty to 4.2% of the population in 2045.
- **The fiscal impacts of physical and transition risks.** LTS preparation can be an entry point for identifying relevant risks and exploring options for managing these risks, such as disaster risk financing instruments

to manage expected increases in disaster relief and recovery expenditure (see Function 3). For example, **Colombia's** LTS considers the role of long-term catastrophe insurance for public infrastructure. Moreover, many countries that depend on royalties from the production or export of fossil fuels to finance public spending could see that income bases erode in a global shift to net zero (see Function 2). LTSs can help anticipate these shifts so that Ministries of Finance can plan effective actions in response to this changing context.

- **The required budgetary and fiscal reforms.** In the LTS formulation process, Ministries of Finance can consider a wide range of potential fiscal instruments to raise the necessary capital for the identified investments and shape economy-wide incentives to help drive decarbonization and resilience, including through the budget and medium-term expenditure frameworks (see Function 2). The LTS can point to sectors where new fiscal measures or reforms are most necessary, assessing their economic, distributional and environmental impacts on indicators such as emissions. **Morocco's** LTS outlines a strategy for green fiscal reform in the industrial sector and suggests implementing green taxes, a carbon market and targeted subsidies to direct investments and incentivize consumption of low-carbon products.
- **The required investment needs**. The LTS can be an opportunity to estimate the investment need associated with delivering an LTS by sector and type of investment. Over time, this can help to indicate the largest finance gaps, facilitating understanding of barriers to investment, and informing how to set out a strategy for addressing these (see Function 1).
- **Potential sources of international climate financing.** The Ministry of Finance is usually responsible for working with the Ministry of Development or Foreign Affairs to coordinate international finance and maintain a dialogue with multilateral and bilateral entities to identify work priorities. The LTS can serve as a natural framework for channeling support in a coordinated manner. In addition, as board members of the MDBs with other line ministries, Ministries of Finance can reshape the role of these international organizations and work toward strengthening their efforts address the climate crisis (see Function 3).

Real world examples

Compared with NDCs, developing long-term development strategies is still a relatively novel process and often features less strong involvement by Ministries of Finance. However, certain countries are showing strong signs of emerging Ministry of Finance leadership, as described below. Further examples are also outlined in the Helsinki Principle 1 reports.

- The **UK** launched its Net Zero Strategy in 2021 with the goal of lowering greenhouse gas emissions to 'net zero' by 2050, setting out the vision for a decarbonized economy and guidelines and steps to take across key sectors to keep the UK on track for its NDCs and carbon budgets—the five-year statutory caps on total emissions set by the independent Climate Change Committee. The strategy sets targets to reduce emissions for each sector and for capturing the remaining emissions with green carbon capture technologies or natural carbon sinks. The development of the strategy was supported by the Treasury from the beginning. The Treasury assesses the fiscal implications and risks of the transition and the social impacts of the strategy, and is responsible for the investment needs assessment, including additional public and private capital investments required to achieve net zero. Through publishing the Net Zero Review (2021), the Treasury assessed the costs and benefits of the transition, impacts on households and government finances, and the economy's competitiveness.
- In **Burkina Faso**[15] the Ministry of Finance was involved in all stages of the LTS preparation process, including: (i) leadership in sectoral groups to ensure integration of the crosscutting finance in the development of LTS pathways; (ii) in the LTS Technical Monitoring Committee, the scientific and technical body charged with

[15] The case studies on Burkina Faso, Ethiopia and Fiji were provided by Aaron Drayer (GGGI).

analyzing the quality and relevance of the data and documents collected, and proposing options for LTS implementation; (iii) the LTS Steering Committee; and (iv) leading the support and review of technical aspects of the LTS strategy.

- **Ethiopia's** Ministry of Finance appointed a representative to the Steering Committee that has political oversight of the LTS process and representatives in four sectoral working groups to provide technical inputs for low-carbon development scenarios, investment needs and financing mechanisms.
- In **Fiji**, the Ministry of Economy's Climate Change and International Cooperation Division (CCICD) was responsible for developing the LTS and now holds the main coordination role for its implementation. The LTS identifies a strategic high-ambition net zero vision for 2050, as established in the country's national development plan, and contains a non-exhaustive list of prioritized actions with high-level costing and timelines. It is closely aligned with the NDC and gives substantial coverage to adaptation in the form of climate-resilient development. The Ministry of Economy also acted as the facilitator between donors, climate funds and sector recipients of climate finance to support an integrated proposal design, funding alignment with priorities, and efficient implementation arrangements.

Ministries of Finance can also learn from the analytical exercises undertaken by numerous countries to support LTS development:

- In **Chile**, a macroeconomic evaluation of the net zero objective found that enhancing the measures put forward to comply with the NDC would result in a net gain of 0.8% of GDP by 2050, on top of the 4.4% GDP gain that the current NDC plans would bring (IDB, 2021). The LTS also introduces a Climate Change Financial Strategy led by the Ministry of Finance to contribute to the goal of carbon neutrality and resilience by 2050 through the strategic use of public and private financial resources, which promotes an integrated model of value creation in the long term where the social, environmental and economic dimensions are incorporated in a balanced manner.
- **North Macedonia**, with similar regard to understanding the implications of LTS for the domestic economy, conducted analysis to find that up to 10,000 jobs could be created each year in green sectors if the policies included in the ambitious scenario in the LTS were implemented.
- **Cambodia**, in estimating investment needs for the LTS, estimates that required public financing will amount to almost $9 billion for the 2025–2050 period. New public borrowing, shifts in public spending on economic services and policy reforms in the transportation sector are estimated to cover 74% of the total requirements, with international climate finance expected to meet the remainder.
- **Costa Rica** is an example of a country in which LTSs are already being used for resource mobilization. The LTS has been the foundation on which at least $2.4 billion has been mobilized from international concessional finance sources between its launch in 2019 and the end of 2022. The data-driven, stakeholder co-designed LTS defines a roadmap to achieve net zero emissions by 2050 and includes short-term measures across 35 line ministries and government agencies, which serve to inform Paris-aligned investments from international donors (Jaramillo et al., 2023).

ii) Nationally Determined Contributions (NDCs)

Context and role of Ministries of Finance

Nationally Determined Contributions are the cornerstone of global climate action, reflecting national commitments from developed and developing countries toward the achievement of the goals of the Paris Agreement. Successful implementation and continuous enhancement of the NDCs are critical to avoiding the

catastrophic impacts of climate change (IPCC, 2022) while creating the strong policy signals required to accelerate the transition to a low-carbon economy. Under the Paris Agreement, each party is required to submit updated NDCs every five years, outlining their climate commitments for the coming five to 10 years. This makes NDCs crucial for setting out governments' short- to medium-term vision and strategy for climate action, complementing Long-Term Strategies.

Ministries of Finance have a central role in supporting the development, implementation and revision of ambitious NDCs. As with LTSs, there is considerable scope for additional Ministry of Finance leadership. For instance, a recent World Resources Institute study finds that only 58% of developing countries have reported any estimates of the cost of NDC implementation (Caldwell et al., 2022), which suggests hampered ability of Ministries of Finance to channel resources to climate activities, including to create jobs and reduce poverty. Many of the first-generation NDCs were unrealistic and could not be implemented entirely as planned (Coalition of Finance Ministers for Climate Action, 2020b). In many countries this has led to a realization that Ministries of Finance need to be more strongly involved in the NDC process. In some, such as the Philippines, Ministries of Finance are now leading the NDC preparation and implementation process (see example section below).

There are several reasons why Ministry of Finance engagement in NDC development and implementation is so important, including:

- **Ministry of Finance leadership and coordination can strengthen the assessment of climate benefits.** They can support Ministries of Environment and other line ministries to assess the net benefits of proposed policies and investments and ensure that those with the strongest benefits are considered in the context of fiscal, economic and financial constraints.
- **Ministries of Finance can ensure the measures proposed in NDCs are reliably costed in the context of the projected fiscal space available, providing a basis for public, private, domestic and international financing.** They should contribute to assessments of how climate change scenarios and measures impact macroeconomic and macro-fiscal projects. To support budget allocation processes to ensure implementation of the NDCs, they can prepare robust costings that quantify the financial resources required to implement different programs and interventions and review the feasibility within macro-fiscal constraints, taking care to include indirect costs such as job losses and re-training as well as the direct costs. This can improve how realistic and achievable NDC commitments are, which will encourage buy-in and investment.
- **Ministry of Finance leadership can ensure that NDCs contain the information needed for their successful implementation.** This includes through the use of 'SMART' objectives,[16] specific sectoral targets that are detailed and costed, implementation options and financing strategies. If these are missing in existing NDCs, lead agencies can also consider developing a dedicated NDC Implementation Plan as part of the implementation process (UNDP et al., 2020).
- **By inputting into NDCs, Ministries of Finance can help to mainstream climate action early on within national investment planning, fiscal policy, budgeting and procurement processes.** The central role they can play in these respects is covered further in Functions 2 and 3.
- **Ministries of Finance can lead the translation of NDCs into clear investment plans and climate financing strategies.** Translating NDC priorities and the cost of implementing the NDCs into financing strategies at the sectoral level is key to driving real economy change. Ministries of Finance need to ensure that line ministries and agencies develop climate financing strategies for their respective sectoral decarbonization targets and build and leverage the systematic information on their climate-relevant budget spending (see also Function 2).

(Coalition of Finance Ministers for Climate Action, 2020b, 2022f)

[16] SMART objectives are specific, measurable, achievable/agreed-upon, realistic and time-bound.

Real world examples

A range of case studies highlight the successful engagement of Ministries of Finance in different stages of the NDC process. In addition to the examples discussed here, the Coalition of Finance Ministers' reports on NDCs prepared by the Helsinki Principle 6 Working Group provide a wide range of case studies discussing Ministries' involvement in the different steps of NDC development and implementation.

In several countries, Ministries of Finance are now NDC lead agencies. For example:

- In **Rwanda**, the Ministry of Economy and Finance (MINECOFIN) coordinated the NDC revision and participated in every stage of the NDC's updating—by chairing sessions to discuss and agree the main NDC interventions and corresponding key performance indicators (KPIs). It directed the development of the NDC implementation framework, jointly with the Ministry of Environment and with support from the NDC Partnership, and led the development of monitoring, reporting and verification (MRV) systems. Rwanda MINECOFIN was also instrumental in engaging the private sector and civil society in the NDC's revision. KPIs have been incorporated into the MRV system and will be used to track NDC implementation and to integrate climate change interventions in policies, strategies, and single action plans (Coalition of Finance Ministers for Climate Action, 2022f).
- In the **Philippines**, NDC development is led by the NDC Technical Working Group of the Climate Change Commission (CCC). The CCC has been chaired by the Department of Finance (DOF) since the President of the Philippines recognized ahead of COP26 the important role of the DOF in mobilizing finance and ensuring resilience against climate impacts and disaster risks: the President consequently appointed the Finance Secretary as the Chairperson-Designate of the CCC. The CCC is currently preparing the country's updated NDC. Once the NDC's policies and measures have been finalized, the DOF and the CCC will jointly develop the NDC Financial Plan with input from other relevant ministries (Coalition of Finance Ministers for Climate Action, 2022f).
- In **Sudan**,[17] the Ministry of Finance and Economic Planning is the focal point for NDC implementation. Together with the Higher Council for Natural Resources and Environment, the Ministry is working to mainstream climate into key national systems and processes, mobilize funding, and coordinate national and international efforts to promote low-carbon and climate-resilient development.

In other countries, Ministries of Finance are not leading NDC development, but nonetheless provide key inputs. For example:

- In **Chile**, the Ministry of Environment is the NDC lead agency, but a strong institutional framework enables the Ministry of Finance to participate in different components of the NDC process. A multi-agency group worked on scenario analysis of mitigation options to determine the optimal NDC climate targets. The Ministry of Finance then evaluated the set of mitigation measures that are financially profitable. The Ministry of Energy calculated costs for mitigation options, while the Ministry of Finance provided the GDP forecast for modeling different scenarios. This approach enabled the government to develop a good understanding of the costs and benefits associated with climate action, and thus to identify what could be achieved within current economic realities (Coalition of Finance Ministers for Climate Action, 2020b).
- In **Norway**, the Ministry of Climate and Environment has the overarching cross-sectoral responsibility for coordination and implementation of the NDC. The Ministry of Finance is responsible for implementing the economic measures, particularly carbon taxes and emissions trading, that are central to the NDC. It regularly prepares projections of greenhouse gas emissions as part of this process (ibid.).
- **Uruguay's** Ministry of Economy and Finance has developed a macroeconomic model (dynamic general

[17] Contribution from Sujala Pant (UNDP).

equilibrium/DGE) for modeling the effect of the country's next mitigation targets on key macroeconomic variables, which inform the preparation and will support the implementation of Uruguay's second NDC. It is has done this in cooperation with the World Bank and with the support of the National Climate Change Response System.

iii) National Adaptation Plans (NAPs)

Context and role of Ministries of Finance

More frequent and damaging extreme weather events are increasingly highlighting the imperative for bold action on adapting to climate change; this action must include leadership from Ministries of Finance. Many Ministers of Finance are already having to deal with the consequences of climate change on a daily basis as floods, droughts and other extreme weather events harm sovereign assets, increase public debt and negatively impact sovereign credit ratings, impeding access to finance (see Part A).

There has been an increase in adaptation finance, but it remains severely underfunded. Total adaptation financing amounted to only around $56 billion in 2019/2020 (CPI, 2022). This is far below estimated existing and future needs, despite growing awareness of the urgency for adaptation action and the clear high benefit–cost ratio of investment. The UNEP Adaptation Gap Report 2022 estimated that annual costs of adaptation in developing countries alone could range from $160 billion to $340 billion by 2030 and rise from $315 billion to $554 billion by 2050, with recent estimates of cost in the upper realms of these ranges (UNEP, 2022a).

National Adaptation Plans can be a key tool to accelerate progress on adaptation. Formally established in 2010 under the Cancun Adaptation Framework, the NAP process enables countries, particularly developing countries, to identify and address their medium- and long-term priorities for adapting to climate change (NAP Global Network, 2020). By analyzing current and future vulnerabilities to climate impacts, NAPs provide a basis for Ministries of Finance to identify and prioritize adaptation options, and to set up the systems to integrate adaptation into national planning, decision-making and budgeting processes, increasing the resilience of the public finances (ibid.).

Ministry of Finance involvement in NAPs so far has been limited; there is much scope to enhance their engagement. So far, only 40 NAPs have been communicated to the UNFCCC (UNFCCC, 2022c) and most countries are still too focused on planning at the expense of efforts to implement the plans and translate the priorities they identify into investment programs and other actions (conversation with NAP expert). Of the limited involvement of Ministries of Finance in NAPs, it has often been only at the final stages of the planning process (ibid.).

However, there are signs that Ministries of Finance are now increasingly engaging on adaptation. In early 2022, the Coalition of Finance Ministers established a workstream on adaptation, and a first survey it conducted highlighted that some members are starting to build adaptation into their policy analysis and tools, with NAPs being at the core (Coalition of Finance Ministers for Climate Action, 2022b).

Ministries of Finance have an important role to play throughout all stages of the NAP process. In particular, they can work with the lead agency, such as the Environment Ministry, by leading or supporting the following processes:

- **Costing measures and ensuring adequate financing.** Evidence so far suggests that while most NAPs are assessing and prioritizing adaptation actions, they are less successful at identifying realistic financing methods (Bettinger, 2021). To identify financing needs, possible financing options and a process for securing finance, Ministries of Finance can develop dedicated NAP financing strategies (see below).

- **Securing private sector involvement and financing.** The private sector should be involved in the planning process to increase awareness and alignment. It can be both a financier and implementer of adaptation action and can provide data for M&E processes (IISD, 2022). It can also be consulted on barriers that need to be removed to facilitate private sector financing of adaptation measures.
- **Tracking adaptation financial flows.** Tracking financial flows is essential for monitoring and evaluating adaptation plans. Ministries of Finance are well placed to set up tracking systems, starting with international adaptation flows before moving to less-established tracking of domestic and private finance (IISD, 2022).
- **Mainstreaming the NAP into national planning and budgeting processes.** Ministries of Finance are key to ensuring that the NAP planning process is aligned with the budget and development planning schedule and that the budget process is then used to implement outlined actions. They should also work with line ministries to integrate adaptation into sectoral budgets. They can also analyze adaptation impacts as part of ex-ante assessments of new government policies, setting up sound fiscal risk management frameworks, and integrating adaptation into the budget process and public investment cycles (see Functions 2 and 3).

The survey conducted by the Coalition's Adaptation workstream found that financing adaptation plans is a particular challenge for Ministries of Finance (Coalition of Finance Ministers for Climate Action, 2022c). Dedicated financing strategy for adaptation can help countries establish a coordinated approach toward mobilizing finance. The International Institute for Sustainable Development (IISD) provides a guide for developing such strategies, a process composed of three main building blocks: (i) identifying the financing gap; (ii) identifying potential sources of financing; and (iii) identifying operational next steps such as building capacity, fostering relationships with key actors or preparing specific proposals (IISD, 2022).

Real world examples

While Ministries of Finance have been slower to get involved in NAPs than in NDCs and LTSs, there are encouraging signs of their leadership on both planning and implementation of NAPs. For example:

- In **Togo**, the Ministry of Economy, Finance and Development Planning (MOEFDP) is part of an Inter-Ministerial National Adaptation Plan Committee, established in 2014 and led by the Ministry of Environmental and Forest Resources (MERF). It is working closely with the MERF to ensure that adaptation is mainstreamed into national policies, including the NDC and the country's development goals. The MOEFDP is taking steps to align the NAP process with its national development and budget planning cycle, identifying key entry points for integrating adaptation into the budget process. As part of this, members of the Medium-Term Budgeting Framework Committee also received training in how to integrate adaptation into the budget process (GIZ, 2019).
- **Fiji's** Ministry of Economy has developed a methodology to provide rapid and comparable cost estimates for the 160 prioritized actions in Fiji's NAP, for 2021 to 2025. An MS Excel-based tool, it has low data input requirements compared with most other economic models and is designed to be easily adapted and updated (Government of Fiji, 2020).

Barriers to action and ways to overcome them

Several barriers currently prevent most Ministries of Finance from contributing to strong national climate strategy plans (i.e. LTSs, NDCs and NAPs). While each process comes with its own set of challenges, commonalities include:

- **Lack of coordination** between Ministries of Finance and Ministries of Environment (or the respective lead agency), which can lead to limited or delayed involvement of Ministries of Finance in the relevant processes.
- **Lack of capacity in Ministries of Finance,** with the main constraints reported by Ministries of Finance in

the Coalition's Helsinki Principle 6 2020 survey being human resources (53% of respondents) and technical capacity (44%), including a lack of tools to comprehensively analyze the links between climate change and the economy (Coalition of Finance Ministers for Climate Action, 2020b).

- **Lack of granular data and tools,** including for modeling and assessing the costs, benefits and impacts of policies and investments. There is a particular need to improve data availability and projections to inform macroeconomic and macro-fiscal modeling of climate change impacts and benefits. Notably, for LTSs there is a lack of granular information on long-term transition pathways and technology options for net zero, while data on adaptation is often especially challenging (ibid., 2022).
- **Lack of climate finance and challenges identifying sources of international climate finance.** The complexity of the international climate finance landscape requires substantial expertise and administrative efforts, particularly for small Ministries of Finance, and those in small island developing states (UN-OHRLLS, 2022).
- **Lack of processes and tools that ensure accountability and provide feedback for the next iteration,** such as a monitoring, reporting and verification (MRV) framework and processes to track climate finance flows, particularly for adaptation.

To overcome these barriers, Ministries of Finance should view climate planning as being a core responsibility and invest resources into processes from the start. In particular, they should focus on:

1. **Strengthening, or creating, effective governance arrangements.** Clear arrangements are needed to ensure the participation of all relevant agencies across all parts of the development process of all climate plans. In many cases, countries already have set up governance structures dedicated to NDC delivery, which can also be used for LTSs and NAPs (see case studies and Capability 3). Such governance structures could include a *Steering Committee* that gives the political and strategic steer; a *Technical Committee* that gives the technical directions for the elaboration, facilitates data collection, ensures work is tailored to the needs of respective ministries, and so on, composed of several ministries, departments and agencies; and a Core Group that carries out day-to-day coordination activities. These structures should be convened under the guidance of a lead or set of lead ministries: an important role for the Ministry of Finance with the Ministry of Environment, or a collaboration between the two.
2. **Investing in capacity, tools and data, including for MRV processes**. A number of initiatives that can help Ministries of Finance build the capacity to engage on NDCs, NAPs and LTSs are listed below. On MRV, a range of tools now exists to monitor and measure progress that can help Ministries of Finance develop their own frameworks (see Caldwell et al., 2022). In addition, the UNFCCC's Enhanced Transparency Framework (ETF) will enter into force in 2024, with the aim of providing clarity on the support provided and received to meet mitigation and adaptation commitments. More broadly, to ensure productive engagement on climate plans, it is essential to create and strengthen the capacities that Ministries of Finance need to understand and integrate climate change into their mandates and tools, and to mainstream climate change into public financial management, public investment management, public procurement, and economic and fiscal policies. These steps are outlined in further detail in other sections of this report (see Functions 2 and 3 and Capability 3).
3. **Developing dedicated climate finance strategies and/or investment plans** to support the implementation of climate strategies. A variety of tools, instruments and funding sources are available to Ministries of Finance, including to harness international finance (see Functions 1c, 2 and 3; also Caldwell et al., 2022).

In particular, Ministries of Finance should focus on: strengthening, or creating, effective governance arrangements; investing in capacity, tools and data, including for MRV processes; and developing dedicated climate finance strategies and/or investment plans.

For Ministries of Finance that are just starting to engage in climate planning processes, it is important to note that they can pursue a variety of entry points for engaging in the climate plan and can pursue a phased approach to suit their economic situation. A Ministry does not need to hold all the knowledge and skills immediately in order to begin the journey of engagement. Rather, it can be an iterative process that evolves over time. Countries can engage in 'learning by doing', assisted by inter-agency collaboration, peer learning and international support.

Several global initiatives exist that can support countries with the development and implementation of NDCs, NAPs and LTSs. For example:

- The NDC Partnership offers a tailored package of expertise, technical assistance, and funding for members on NDCs and LTSs. It supports its member countries in several finance-related topics, including developing climate finance strategies and NDC Investment Plans, integrating NDCs into national and subnational planning, budgeting, public investment, and central banks' supervisory role, developing bankable projects and pipelines, project and program financing and resource mobilization (public and private) and engagement of the private sector in climate action.
- The UNDP Climate Promise supports countries with NDC formulation and implementation.
- The National Adaptation Plan (NAP) Global Network supports developing countries to advance their NAP processes, including through facilitating peer learning and exchange, and providing technical assistance and a range of knowledge products.
- The 2050 Pathways Platform provides a space for conversations among governments on Long-Term Strategies and supports their LTS development.

Opportunities for action

Ministries of Finance should consider supporting lead agencies to develop national climate strategies—including LTSs, NDCs and NAPs. They should ensure they contain strong macroeconomic considerations and cost assessments to inform the role of fiscal policy, budgets and financial instruments by investing resources to engage in all phases of the process, i.e. planning, implementation, monitoring and revision. In particular, they can:

- Support the **preparation** of plans by modeling and developing scenarios to assess the impacts of climate change and of mitigation and adaptation policies, and by costing policies and measures and developing MRV systems.
- Support their **implementation**, by:
  - Integrating climate action into national and sectoral development plans (see Function F1)
  - Following up with dedicated investments plans, helping prepare project pipelines and strengthening the enabling environment for climate investments (see Section F1)
  - Translating objectives into relevant levers for Ministries of Finance, such as fiscal policies, budgeting, public procurement and debt management, as well as assessing the implications of broader structural policies for the public finances (Functions 2 and 3)
  - Developing financing strategies and mobilizing funding (see Function 3).
- Support **evaluation** by improving tracking of climate finance to understand whether strategies are successful in mobilizing finance and feeding insights into the revision process.
- Consider a **phased approach** if they have no previous engagement in climate plans, focusing on being included in relevant processes and increasing their engagement over time as expertise and experience deepen.
- Encourage **alignment across LTSs, NDCs and NAPs** and streamlining of the three processes.

They should work with other involved agencies to agree on roles and responsibilities, including by:

- **Joining relevant inter-agency governance mechanisms**, or encouraging their set-up where they do not exist, and making use of their convening power to support the ministries responsible for LTS formulation to ensure the active participation of line ministries and relevant sectors.
- **Considering taking on overall responsibility for developing climate plans** to drive action and investment across government, as 12 Ministries of Finance globally have done already (Almuzaini, 2022).

Function 1b. Greening national development and sector strategies

Context and role of Ministries of Finance

Government visions and strategies are key planning tools that can lay out national plans and strategies for socioeconomic development. Most governments have a long-term vision or plan, whether a single plan explicitly labeled as such or implicit through their other plans. Most developing countries and emerging markets have a long-term vision and/or a national development plan (NDP) in place. These are sometimes reflected in five-year plans. NDPs, usually produced by Ministries of Finance or Ministries of Planning, form important strategy documents, focusing on poverty reduction through economic growth and job creation. In other countries it is often sectoral strategies that provide roadmaps for action. Both can be important tools to enhance policy coherence across sectors and levels of government, orienting the public and the private sector toward a common goal and documenting public spending priorities, providing important parameters for annual budgets and medium-term expenditure frameworks (see Function 2).

Even the most well-articulated and realistic national climate plans will be difficult to implement if they are not integrated into these broader national planning processes that define public spending priorities. Inconsistencies between plans also cause confusion around countries' plans and priorities, forcing stakeholders to make decisions—such as in which kind of energy to invest—based on conflicting information. By contrast, integrating climate into overall vision and strategy documents sends a clear signal to all stakeholders about government commitment to climate action.

Given their central role in government, Ministries of Finance can be drivers of alignment between climate and other government strategies and plans. They can support the line ministry responsible to ensure that all strategies are consistent, financeable and feasible and accompanied by a suitable policy and financial framework (see also Functions 2 and 3). Given the importance of accelerating investment for tackling both climate change and broader development goals, Ministries of Finance also need to place a particular emphasis on bringing investment planning into line with climate targets (discussed in detail in Functions 1c and 2b).

In recent years, countries have made progress in integrating climate action into national development plans, but more work remains to be done (Coalition of Finance Ministers for Climate Action, 2020b). Aligning NDCs, LTSs and NAPs with NDPs is key to understanding the co-benefits from climate action for sustainable development, and an opportunity to ensure that investments for development, mitigation and adaptation are mutually supportive. As a function of their focus on implementing the Sustainable Development Goals (SDGs), NDPs often include some climate-related targets, yet in many countries climate plans and NDPs lack explicit alignment. For instance, a review of African NDCs and NDPs reveals "critical gaps, tensions, and disconnection" between the two (Okereke, 2021). As a result, climate targets are not being adequately fed into national planning or budgetary processes, resulting not only in less effective NDCs and NDPs that are ill-prepared to tackle the climate crisis, but also a missed opportunity more generally to reduce emissions, build resilience and achieve socioeconomic objectives at the same time.

Ministries of Finance that are actively shaping climate strategies are well-placed to ensure alignment with NDPs. Strong climate plans are a key tool for integrating climate into development planning. As described above, Ministries of Finance can support the development of NDCs and LTSs that are based on country's broader socioeconomic challenges laid out in NDPs. These can then form the basis for successful integration of climate strategies into development planning, significantly increasing the likelihood of successful implementation.

Integrating climate action into development plans will be especially important in five areas that represent the sectors and systems typically responsible for the majority of emissions: energy, cities, food and land use, water, and industry (New Climate Economy, 2018). It is increasingly common to develop dedicated green sectoral strategies—or sectoral decarbonization roadmaps—that map out climate transition plans for key sectors. These typically complement both NDPs and national climate strategies and can provide clear, sector-specific signals with regard to objectives and speed of delivery (e.g. phase-out dates for certain fossil fuel technologies). These sector strategies can help to form the basis for unlocking transition finance as part of sustainable finance roadmaps (see Function 3). While sectoral planning is improving, an ongoing assessment of green sectoral planning by the Green Economy Coalition finds that in most countries it remains weak, and coverage of important sectors is limited (Green Economy Tracker, 2022). Although the process of designing sectoral strategies is usually led by the relevant line ministry, Ministries of Finance should be involved and encourage their step-by-step development. Their involvement is crucial first to ensure alignment with overall national climate and development strategies; second, to facilitate cross-sectoral coordination; and third, to inform the design of sector-specific regulations and fiscal incentives (see Function 2).

Ministries of Finance have a role to play in aggregating individual sectoral strategies to provide an overview of the country's progress on transition planning, and transparently reporting on it. This includes determining key challenges and opportunities and any additional policies and measures needed to ensure the country is on track to meeting climate targets.

Barriers to action and ways to overcome them

Failure to integrate climate plans into national planning documents can be caused by a range of factors. These include:

- Lack of awareness of climate change within the Ministry of Finance, leading to a hands-off approach toward climate change and a perception of there being strong trade-offs between climate action and development.
- NDCs, LTSs and NAPs that lack detailed sectoral and cross-sectoral targets and measures and hence cannot provide useful input into national development or sector strategies.
- Misalignment of timelines for planning and reviewing climate and development strategies.
- Lack of cross-ministerial coordination mechanisms.

As a first step toward removing these barriers, Ministries of Finance should firmly involve themselves in the development of climate plans, for two main reasons:

- Ministries of Finance involved in NDC, NAP and LTS processes have greater awareness of the consequences that inaction on climate has for development, as well as the many benefits climate action can bring. Thus they have a greater understanding of the benefits of integrating climate into national development planning. At the same time, they can ensure that climate strategies contain the necessary features, including detailed targets and budgets, that are needed for successful integration into NDP or sectoral strategies.
- Aligning NDCs and NDPs is made easier when both these planning processes coincide (Bird et al., 2018). Where this is not already the case, Ministries of Finance can consider shifting time frames so that both documents can be developed (and subsequently implemented and reviewed) in parallel, enabling both to benefit from cross-fertilization.

Putting in place structures that allow for successful cross-ministerial coordination is particularly important in cases where there is a separate Planning Ministry in charge of NDP development or where dedicated sectoral plans are led by the relevant line ministries. In these cases, setting up working groups or cross-sectoral climate change commissions between the Ministry of Finance and the ministries responsible for development and climate strategies respectively can help secure cross-strategy alignment and enable Ministries of Finance to take an active role in coordinating economy-wide transition planning (see also Capability 2).

Lastly, it is important to note that planning documents like NDPs are not always the main expression of government priorities. Not every country publishes explicit long- or short-term plans. Some governments define their priorities and work programs based on party manifestos or coalition agreements, over which the Ministry of Finance may have limited influence. In these cases, strong NDCs and LTSs, documents all signatories to the Paris Agreement are required to submit, play a particularly important role in guiding countries toward net zero.

Real world examples

There are some examples of successful integration of climate plans into national development strategies and planning processes (see below). However, in many cases NDPs may reference climate action as a priority but fail to specifically align with NDCs and other climate plans.

- **Uganda** highlights the importance of inter-ministerial collaboration for the alignment of climate and development plans. The Ugandan government formed a tripartite arrangement between the Ministry of Finance, Planning and Economic Development (MOFPED), the National Planning Authority (NPA) and the Ministry of Water and Environment (MWE-Climate Change Department) to improve inter-ministerial collaboration and alignment of climate policies with national priorities. This approach has already resulted in greater policy alignment, including the upcoming National Development Plan (NDP I) having a chapter on climate change, thereby supporting alignment of the country's NDCs and other national climate policies with national development priorities. This is critical to ensuring effective and appropriate allocation of funds within the annual budgets and subsequent implementation of climate change priority actions (see Box B19).
- In **Nigeria**, the Ministry of Finance-led National Development Plan contains a chapter on environment and disaster management and plans for investment in sustainable infrastructure, climate mitigation, adaptation and resilience. Objectives outlined in the chapter are aligned with those set out in the country's NDC.
- The **Irish** government that took office in 2020 brought forward the revision of the country's National Development Plan to focus on a sustainable and regionally balanced growth. The 10-year plan proposes an investment package of €165 billion that will support economic, social, environmental and cultural development across the country. It is closely linked to the country's climate action plan and is the first time the government has undertaken a systematic climate and environmental assessment of all capital expenditure plans. This means that climate concerns are now directly integrated into long-term strategic planning—leading to a greater emphasis on public transport and renewable energy developments.
- In **Mexico**, the 2018 Federal Budget established a formal link between the national planning process, the global 2030 Agenda and the SDGs. This provides Mexico with the necessary inputs for implementing a long-term strategic plan toward achieving the 2030 Agenda, and for monitoring and reporting its results and impacts. Based on the yearly budgetary approval process, the government can make public policy decisions and subsequently propose to the Chamber of Deputies SDG-aligned budgetary resource allocations.

Countries are also starting to develop sectoral plans—in some cases as part of broader decarbonization strategies. For example:

- **Bangladesh** and **Morocco** have national sustainable development strategies with strong sectoral decarbonization plans, supported by cross-sectoral advisory bodies to ensure coordination.
- In **Uganda**, the tripartite arrangement between the Ministry of Finance, Planning and Economic Development, the National Planning Authority and the Ministry of Water and Environment also developed the Green Growth Development Strategy, which sets an agenda for the green development for key economic sectors in support of the NDP II.
- In **France**, the Ministry of Finance coordinates the development of sectoral decarbonization roadmaps in key

sectors (including chemicals, steel, aviation, cement and food). As stipulated by article 301 of the 2021 French Climate and Resilience Law, these roadmaps are developed together with business in the relevant sectors and local authorities, in order to identify a broad number of levers along the entire value chain to drive the transition to net zero.

Opportunities for action

Ministries of Finance should help to integrate climate action in National Development Plans and develop decarbonization strategies for key economic sectors. To facilitate integration, they should:

- Actively shape climate-related plans and strategies, to ensure they are realistic and financeable, and provide the necessary detail to guide NDPs and sectoral strategies (as above).
- Consider aligning planning timeframes and setting up cross-ministerial governance structures to ensure successful collaboration between relevant agencies.
- Encourage the greening of sectoral strategies and/or the development of green sector strategies, playing a coordination role to address cross-sectoral challenges (see Function 1c) and linking these to sustainable finance roadmaps and transition finance (see Function 3).
- Ensure that their own departmental strategy documents integrate climate priorities (see Capability 1).

They can also take an active role in coordinating economy-wide transition planning, including by aggregating individual sectoral strategies.

Function 1c. Shaping 21st century industrial and innovation strategies[18]

Context and role of Ministries of Finance

Climate action requires major structural transformation of the world's economies. Technological innovations and the pricing of emissions will be followed by the phasing out of some economic activities and the rapid growth of others, such as renewable energy and new green industrial sectors. These include green hydrogen, battery manufacturing, and new forms of urban mobility. In turn this will lead to a reallocation of labor and capital across sectors (Pisani-Ferry, 2021).

Ministries of Finance, and governments more broadly, will need to play a major role in managing these changes. An increasing number of countries are therefore developing green industrial and/or innovation policies to help the growth of new low-carbon, climate-resilient sectors and to transition away from old ones (Altenburg and Assmann, 2017). Such policies can form part of National Development Strategies and be closely linked to climate plans. They aim to reinforce the allocative effects of markets with the objective of restructuring economies over time toward better societal outcomes. This is done through macroeconomic or sector-specific incentives such as by financing innovation directly or providing subsidized credit to new growth industries (Hausmann and Rodrik, 2003, 2014; Mazzucato, 2021).

The use of fiscal policy (and other forms of public policy) to accelerate green industrial transformation and innovation is justified by at least three core arguments:

- **Dynamic cost curves and information failures.** In any industry, pioneers and innovators create positive spillovers from increasing knowledge or knowhow (Hausmann and Rodrik, 2003). They experience 'first-mover disadvantage', whereby innovators have to cover the upfront cost of innovation but share its benefits with imitators as costs fall over time following dynamic cost curves; this can be an incentive for the private sector not to invest and innovate in creating the industries of the future. Moreover, there is often a lack of data on the financial and risk performance of long-term infrastructure projects that use new technologies, making the investment evaluation process problematic and deterring potential investments. This may have to be corrected by Ministries of Finance working with other agencies to subsidize both national innovation and efforts to scale up new technologies for mass markets. Public investment is therefore often crucial for transformative innovation, given its long-term and risky nature (Mazzucato, 2021). For example, **Chile** utilizes multiple instruments to support first movers, including a grant that finances up to 50% of the cost of research and pre-investment for non-conventional renewable energy projects, and soft loans (OECD, 2022c).
- **Externalities and other market failures.** Similarly, sustainable infrastructure in new sectors often has significant positive externalities for the economy (such as improved air quality) that cannot be wholly appropriated by private sector investors, thus reducing their risk–reward profile. Conversely, the negative externalities associated with unsustainable infrastructure (such as carbon emissions) are rarely accounted for in their costs, encouraging oversupply. Other market failures related to sustainable infrastructure include the presence of public goods and natural monopolies that lead to the undersupply of capital. Moreover, the economics of the renewable energy sector is different from carbon-intensive sources. In particular, their fixed costs tend to be high and their marginal costs low (IEA, 2020). To make the production of renewables attractive, it can therefore be necessary to subsidize the cost of capital, especially in countries where the cost is high. More generally, carbon pricing is often not fully sufficient to incentivize the greening of the

[18] Based on a contribution by Ishac Diwan, Martin Kessler and Yomna Mohei Eldin (Finance for Development Lab).

entire energy system, with complementary tools often needed, such as R&D subsidies or tax exemptions (Rosenbloom et al., 2020).

- **Institutional and coordination failures.** Key sector and system transitions usually require strong cross-sectoral coordination. For instance, EV adoption might require coordination between the transportation, industry, research and energy sectors, including investment in the grid and charging infrastructure, which creates network externalities. Thus, coordination across ministries and other key stakeholders is often essential to designing policies and investments that tackle the different overlapping bottlenecks.

The use of targeted fiscal incentives to help to address these various challenges in specific sectors is covered in further detail in Function 2 below.

While Ministries of Finance are rarely at the helm of designing or implementing industrial and innovation policy, which tends to be the purview of the Ministry of the Economy or National Development Banks, they should consider encouraging the development of such policies. Working closely with other line ministries, they can play a key role in several key areas:

- **Setting strategic objectives.** Creating the economy and industries of the future requires multi-year policy planning. The fiscal space necessary for the public sector to invest in catalyzing the industries of the future requires the integration of these needs into the budget cycle—with leadership from Ministries of Finance (see Function 2).
- **Coordination and use of fiscal policy to encourage sunrise industries.** Industrial and innovation policy is at the intersection of horizontal tax policy such as carbon taxation and targeted efforts aimed at specific growth sectors. The coherence of these actions can be supported by Ministries of Finance. **Denmark**, for example, has a strong track record of first using targeted support to shift sectors onto a green trajectory, which is then complemented in the following years by economy-wide measures such as carbon pricing or regulation (Batini et al., 2020). Moreover, Ministries of Finance have a key role in ensuring that recipients of low-carbon firms receiving support from a national grant, loan or a guarantee program know ex-ante whether the goal is to develop a new product, to increase the cost efficiency of existing products, or to generate green jobs, as well as the performance benchmarks it is expected to meet (see further information in Function 2 on fiscal incentives).
- **Financial transparency and accountability**. Ministries of Finance and public agencies involved in financing green industrial policies can play a key role in publishing reports on the policy's budget and impacts. They should acknowledge and communicate that experimentation and a degree of failure is an essential part of the structural transformation process to avoid officials' attempts to pick winners, conceal failure or deal with public distrust from failure episodes. Ministries of Finance can build the capacity of other public agencies on transparent policy reporting and accountability. The IMF fiscal transparency code (IMF, 2019b) can be utilized as a guide to governments on including costs and benefits of policy packages.
- **Ongoing coordination with the private sector to identify bottlenecks and assess policy results**. Ministries of Finance can create channels of communication with private sector representatives from different industries to identify existing bottlenecks to green innovation, and tailor policies to remove them. The channels of communication should have a clear institutional framework to avoid creating room for rent-seeking or corruption, including a clear and transparent mandate, procedures and performance reports.
- **Ensuring climate resilience.** Ministries of Finance can play a role in making innovation and industrial strategies climate-resilient, designed to withstand a changing climate and to provide solutions that help society to cope.

Box B1. The role of Ministries of Finance in driving low-carbon innovation and competitive advantage

A 2023 study by the Smith School of Enterprise and the Environment at the University of Oxford and the Swedish Energy Agency is one of the first to look at the powerful role of Ministries of Finance in driving and shaping the low-carbon transition, emphasizing innovation. The report:

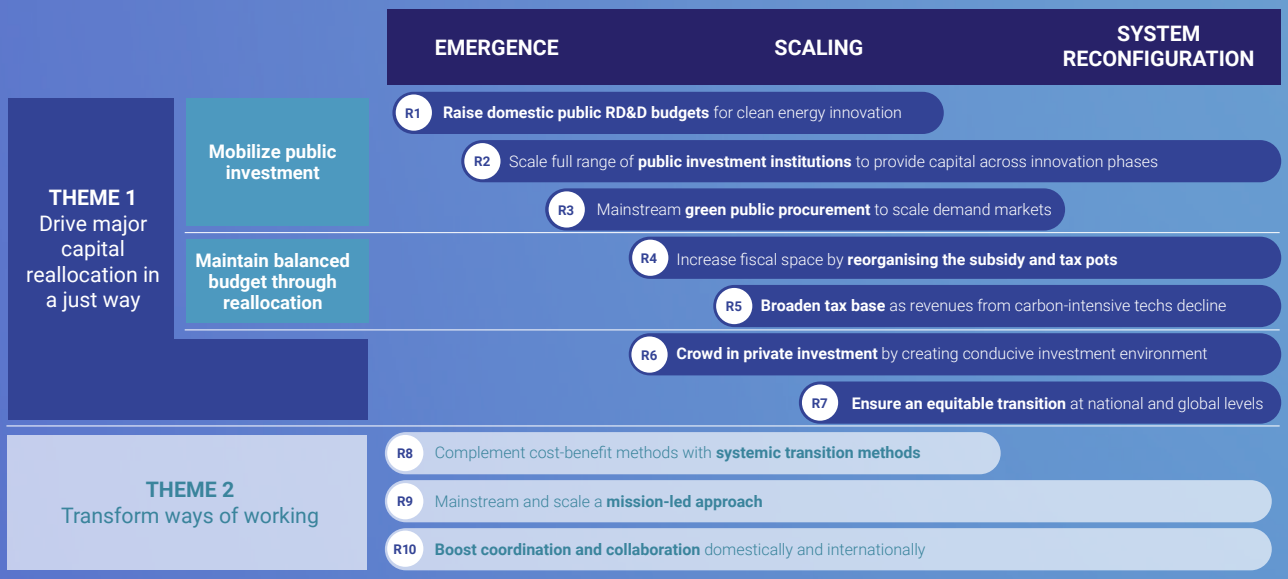
- Reinforces the criticality and relevance of Ministries of Finance in driving innovation.
- Outlines salient risks and opportunities facing Ministries of Finance.
- Synthesizes a set of recommendations (and subsequent tangible actions) for ways that Ministries of Finance can refine and harness their existing mandate to better drive and shape the transition, with an emphasis on the role of innovation.

The report cautions against a short-term survivalist mindset by policymakers and outlines the opportunity for Finance Ministers to offer visionary leadership. The transition to net zero emissions will arguably shape the competitive advantage of nations more than any other event in the last century. Continuing to bring down the costs of clean energy and to innovate further in the use of clean energy in transportation, industry and agriculture presents huge opportunities, and the payoff from strategic and systemic thinking is now very high.

The report outlines how the scale of the transition presents an opportunity to reimagine much of the global economy and pursue pathways that are smarter, more sustainable and more inclusive. Numerous and vast opportunities (beyond mitigating climate risk) exist across the economy. Annual sales of final low-carbon goods and services have been estimated at £9 trillion ($11.2 trillion) by 2030, roughly 10% of global GDP (McKinsey, 2022). Natural capital endowments, such as in renewables and hydrogen, are factors that countries could harness to give them a new dimension of competitive advantage. A rapid switch to renewable energy, storage and innovative demand-side response technologies presents an opportunity to eliminate the 'energy trilemma'—the trade-off between energy being clean, equitable and secure. It limits reliance on dangerous fossil fuels, reduces energy prices, manages inflation, generates sovereign energy capacity and security, creates jobs, reduces air pollution and mitigates extreme climate change.

The report puts forward priority principles for Ministries of Finance to harness the low-carbon innovation opportunity (Figure B3). These priority principles address key challenges based on discussions with policy practitioners and from leading institutions.

Figure B3. Framework of principles to better drive and shape low-carbon energy transition



Note: R = Recommendation.
Source: Oxford Smith School and Swedish Energy Agency (2023), reproduced with permission

Some Ministries of Finance may have direct or indirect responsibility for competition policy and state-aid rules, which can play an important role in supporting green industrial and innovation policy.[19] In recent years, the nexus between climate action and application of competition law and state-aid rules has been increasingly debated (OECD, 2021d; Rodrik, 2014). Competition rules, for example, can be used to prevent the emergence of cartels or monopolies which might slow the emergence of low-carbon technology or that oversell their green credentials to consumers. At the same time they can ensure some flexibility for encouraging collaboration between companies on, for example, emission standards or in joint ventures to help share the costs or spread the risks of capital-intensive low-carbon investments. The application of state-aid rules is likely to require a similar balancing act. For example, it might require providing some flexibility for targeted, time-bound fiscal support to catalyze certain sectors while ensuring this does not unduly alter the competitive playing field for business (see also Function 2a).

Trade policy is another area that is likely to demand the attention of at least some Ministries of Finance. In the face of ambitious climate policies, liberal trading regimes can increase the risk of carbon leakage, potentially undermining the effectiveness of domestic climate policy. Trade policy can equally be an important way of advancing the green transformation. International trade can help ensure low-cost access to low-emission goods and technologies. Free trade agreements can differentially reduce or remove tariff, non-tariff and regulatory barriers to trade in environmental goods and services (see e.g. WTO, 2022). Trade negotiations can also provide a platform for incentivizing collective action. The Agreement on Climate Change, Trade and Sustainability (ACCTS) between New Zealand, Costa Rica, Fiji, Iceland, Norway and Switzerland illustrates the potential synergies between trade and climate policy by focusing on measures such as the removal of tariffs on environmental goods and reducing the use of harmful fossil fuel subsidies.

[19] The following paragraphs are based on a contribution by John Ward (Pengwern Associates).

Ministries of Finance have an important role to play in convening a strategic whole-of-government response on how climate policy shapes competition and trade policy. While other government ministries may have a lead role, Ministries of Finance will often be uniquely positioned to see the opportunities these agendas provide to support low-emission growth. Specifically:

- **On competition policy**, Ministries of Finance may be able to contribute to strategic guidance to independent bodies tasked with the technocratic implementation of policy.
- **On state-aid policy**, Ministries of Finance can help set up and monitor the application of frameworks that enable governments to understand the challenges faced by those providing low-carbon goods and technologies, while retaining the discipline to avoid regulatory capture and ensuring sufficient accountability, as a further buttress against regulatory capture and to ensure legitimacy (Altenburg and Assmann, 2017).
- **On trade policy**, Ministries of Finance can help set the strategic agenda for how trade policy can mutually reinforce objectives of both climate and economic growth and development.

Barriers to action and ways to overcome them

Ministries of Finance committed to supporting green industrial and innovation policy typically face several barriers, but with clear strategies that can be used to overcome them. One of the most pertinent is ensuring that new fiscal incentives for growth industries do not become unending and unsustainable (covered in more detail in Function 2 below). The use of timebound measures linked to performance benchmarks is often a strong way forward. A lack of technical and institutional capacity to assess the net benefits of targeted fiscal policies in relatively new sectors using novel technologies is another common barrier (covered in Capability 3). The need to overcome coordination failures is especially relevant. For instance, for a company to invest in offshore windfarms, it needs to be assured that other companies are working on establishing a grid to bring electricity from offshore to the centers of demand (Aiginger and Rodrik, 2020). The ability to drive a coherent industrial policy across sectors requires strong cooperation across ministries and bureaucracies.

Possible ways to overcome these obstacles include working closely with business groups as stakeholders to better identify bottlenecks. Examples of such channels include investment advisory councils, private–public venture funds, and sectoral roundtables. Within government, high-level committees can be set up, either through the Prime Minister or ad-hoc bodies; examples include the French High Climate Council, which was set up to increase coordination between the different public agencies and to evaluate the coherence and efficiency of climate policies and policies in the 2050 strategy.

Competition and trade policy are policy areas characterized by significant complexity. In most countries, the day-to-day responsibility for navigating this complexity is tasked to other ministries and independent agencies. A key challenge for Ministries of Finance is to provide relevant guidance that can be operationalized to appropriately steer these other bodies, while recognizing the respective mandates of the different parts of governments. International collaboration between different Ministries of Finance could provide valuable insights on how best to perform this role.

The ability to drive a coherent industrial policy across sectors requires strong cooperation across ministries and bureaucracies.

Real world examples

Several countries are using green industrial and innovation policy to drive low-carbon transformation in key sectors, although in many cases planning is in the early stages. For example:

- **Morocco's** green industrialization strategy is a comprehensive plan that involves multiple stakeholders, including the government, the private sector and civil society. Starting from a desire to diversify the energy mix and reduce the share of imported fossil fuels in its energy supply, Morocco adopted ambitious renewable energy targets in 2008 and created a favorable legal and incentive framework, training and research programs, a project development and implementation agency, and dedicated public funds to finance the required investment (Altenburg and Assmann, 2017). The Moroccan Solar Plan aims to support 52% of the country's electricity coming from renewable sources by 2030. Several solar plants have been built around the country, including the Noor-Ouarzazate complex, one of the largest solar plants in the world. The government has also implemented policies to promote energy efficiency, such as the adoption of green building codes and the implementation of eco-labels for products.
- **India** launched a photovoltaics program in the early 2010s after realizing there were no market incentives for developing solar photovoltaics given the lower local costs of coal-fired power plants. The policy package had the goal of developing solar technology into a competitive alternative by shielding it from private competition with coal. It contained a mix of measures, including preferential feed-in tariffs, renewable energy purchase obligations and certificates, tax incentives, preferential loan schemes, local content requirements to support the build-up of national manufacturing capabilities, and an R&D subsidy for government institutions and the private sector. It led to annual growth rates in the solar energy market of up to 300%. However, while the policy was successful in phasing in solar technologies, it was somewhat less successful in promoting local industrial production (Altenburg and Assmann, 2017).
- The **US** Inflation Reduction Act (IRA) is directing $370 billion of funding for renewable energy and climate action over the next decade, delivered through a mix of tax incentives, grants and loan guarantees, with the goal of lowering carbon emissions by the end of the decade (see also Part A). In the weeks after the signing of the act in August 2022, new manufacturing investment rose by $28 billion and it is expected that the act will add nearly 1% to the country's GDP by the end of the decade (Forbes, 2022).

Some countries are also developing dedicated Green Growth Strategies linked to industrial policy objectives.

- **Ethiopia's** Climate Resilient Green Economy Strategy (CRGE), launched in 2011, introduced a sectoral approach to implementing policy initiatives to achieve development goals and reduce CO_2 emissions by 2025. The mechanism involves identifying key sectors based on their economic importance and CO_2 emissions, setting a business-as-usual scenario and the emissions associated with it and identifying key measures and initiatives based on the feasibility, abatement costs and other aspects of suitability, to inform a short-term growth plan. The strategy discusses expenditure and financing options for the transition as part of its investment needs assessment for the above initiatives. The role of the Ministry of Finance and Economic Development has been to gather financial resources from international funding sources and distribute the available resources (Coalition of Finance Ministers for Climate Action, 2020a).
- **Japan's** Green Growth Strategy is part of a national industrial policy and it includes 14 sector-specific action plans, and five cross-sector policy support measures such as grant funding, fiscal incentives, financial policy guidance and regulatory reform (for renewable energy sources). The key sectors are categorized as energy, transportation, manufacturing and the built environment. Within the transportation space, the government aims to electrify vehicles. Measures for buildings include energy efficiency standards. Energy-related action plans focus mainly on pushing hydrogen energy generation.

Examples of fiscal incentives that Ministries of Finance can utilize in their green industrial policy package are discussed more fully in Function 2.

Opportunities for action

Ministries of Finance should consider the greater use of 21st century industry and innovation strategies in order to manage the transition to net zero. They can build a national ecosystem for green industrial policy and innovation by:

- **Working with industrial development agencies, other sectoral ministries and the private sector** to develop green industrial and innovation policies as part of national planning processes.
- **Designing fiscal policy and other related instruments that encourage green innovation and investments.** A wide range of macroeconomic and fiscal policies can be included in the green industrial and innovation policy toolkit (see Function 2).
- **Integrating green industrial strategies into Ministry of Finance processes.** Structural transformation of key sectors requires a multi-year policy orientation. The fiscal space needed to implement green industrial and innovation policies requires the integration into the budget cycle, public financial management (PFM) and public investment management (PIM) systems, including to ensure that measures outlast individual legislative periods (see Function 2).

2. Shaping investment strategies

Delivering on the strategic objectives and actions outlined in national climate and development strategies will require a major 'investment push' across all forms of capital: in sustainable and resilient human-built infrastructure and 'natural infrastructure' such as forests and wetlands, complemented by investments in human and social capital. How these investments are made will determine the success of countries in reaching net zero emissions by mid-century and achieving climate resilience.

The percentages of capital that will need to come from public, private, domestic and international sources for these investments will vary by country and by investment category. Some estimates suggest around 70% of investments in the energy and land-use sectors can be provided by the private sector (Vivid Economics, 2021). But government has a major role to play too, particularly for investments in adaptation and resilience and in countries with less developed capital markets, alongside putting in place the supporting policies and regulatory frameworks for private investment to materialize (Songwe et al., 2022).

Realizing the necessary investments to implement climate strategies will require active engagement from Ministries of Finance in long-term investment strategy and planning, in cooperation with other key ministries and the private sector. Many Ministries of Finance are directly in charge of national investment planning and project appraisal (Allen et al., 2015),[20] and particularly the kind of long-lived, capital infrastructure required to meet national climate targets. Even where they are not responsible for these areas—often in countries with a separate economic planning ministry—they still play an important role in realizing investments, plus they are often uniquely placed to integrate different investment ideas and to anchor a whole-of-government approach in the sectoral transitions that are needed.

Ministries of Finance will need to play a major role in supporting the identification of investment needs based on NDCs, LTSs, NAPs and NDPs and in developing investment strategies and plans, project preparation and defining tangible project pipelines. Unlocking this investment downstream will then involve feeding investment plants into the budget process and public investment management, along with identifying relevant policies and financial instruments capable of providing the investment at the speed and scale required (see Functions 2 and 3).

[20] In around half of OECD countries and more than a quarter of developing countries, Ministries of Finance are responsible for national investment planning (Allen et al., 2015).

Function 1d. Developing investment strategies including by assessing investment needs

Context and role of Ministries of Finance

To realize the investments needed to accelerate the transition toward net zero economies, long-term investment strategies and plans are required.[21] Investment decisions taken today have a direct impact on the ability of countries to meet their climate targets, not least due to the lock-in effects of long-lived infrastructure. Yet currently, alignment between investment and decarbonization goals is low. For instance, globally, investment in fossil fuel production is projected to increase by an average of 2% per year, which by 2030 would more than double the production capacity compatible with the 1.5-degree target of the Paris Agreement (SEI et al., 2021).

A crucial first step to unlocking the necessary sectoral transformations and future-proofing investment is to assess investment needs per sector, and design clear medium- to long-term strategies with prioritized investments and possible financing splits. This is because while there is a growing consensus around the level of investment needed to meet global climate goals (see Part A), national investment needs and priorities will differ from country to country, depending on each country's size, development level, nature of its economy and vulnerability to climate change.

Currently, few governments systematically assess climate-related investment needs across the economy. One study finds that fewer than half of the G20 countries have integrated both mitigation and adaptation considerations into infrastructure planning, with five mentioning neither adaptation nor mitigation in their infrastructure plans (OECD, 2017b). Interviews with Ministries of Finance conducted for this report support this finding: only a small number of Ministries systematically assess net zero-aligned investment needs across sectors, although some countries are currently in the process of developing necessary processes (see below).

This lack of long-term infrastructure planning that integrates climate mitigation and resilience from the outset is a key barrier to accelerating investment in low-emission and resilient infrastructure (ibid.). Where governments are assessing investment needs, this often tends to be ad-hoc and done by sectoral ministries, with limited cross-government coordination or involvement by Ministries of Finance. Insights into necessary investment in social capital—i.e. training and skills development—in line with a just transition are even more limited.

Ministries of Finance have a clear role in supporting the development of medium- to long-term investment strategies that can serve as roadmaps for sustainable, resilient, and inclusive growth, and in translating NDCs, LTS, NAPs and national development plans into investment plans. These can then serve as powerful guides and signals of the priority attached to the transition to all levels of government, investors, the private sector and the public.

The following steps, adapted from the *NDC Investment Planning Guide and Checklist* (NDC Partnership, 2022b), set out how these plans can be developed:

1. Investment planning capacity

- **Clear institutional and governance arrangements, including a designated lead agency coordinating the overall process, are essential for successful investment planning.** Depending on a country's existing institutional arrangements, this can be either an existing ministry or a specialized agency, but in either case the involvement of Ministries of Finance in relevant processes is crucial, as well as local and regional

[21] There are no universally agreed definitions of the terms 'investment strategy' and 'investment plan' and the two are used somewhat interchangeably in this report.

government bodies and any government agencies involved in investment planning and/or appraisal. The inclusion of public bodies responsible for safeguarding women and marginalized groups is equally important to ensure that any resulting strategy is socially inclusive.

- **Enduring stakeholder engagement is needed to develop realistic investment plans.** Relevant non-government stakeholders, including the private sector and civil society, can assist in identifying and validating investment needs. Stakeholder engagement can improve data quality, increase buy-in, and strengthen accountability, thereby ensuring a more robust output. Due to their central position in government, Ministries of Finance are usually well placed to lead these processes and set up multi-sector and multi-stakeholder processes to identify investment needs and opportunities. A first step can be the development of inclusive multi-stakeholder strategies that include mapping and a process to engage with relevant stakeholders throughout all phases of the investment planning process.
- **Develop a robust monitoring and evaluation (M&E) process** to ensure that resources are distributed appropriately and to provide input for future iterations of the investment plan.

2. Identifying and prioritizing investment needs

- **Overall investment needs and gaps for net zero and climate resilience, and needs across different types of capital, sectors and technologies need to be identified**. In each country, the specific investments required are ultimately linked to the ambition set in climate and development plans, which should form the basis of any needs assessment. Costed climate plans (see Function 1) should also identify financing gaps, i.e. mismatches between required and secured funding.
- **Prioritization needs to happen to ensure attention and finance are channeled toward the most impactful investments.** Prioritization can take place at sector, program or project level. Prioritization can signal relative urgency, and ensure that climate investments are aligned with other national investment priorities.

3. Investment mobilization

- **Barriers to investment** must be identified, and possible ways to overcome them (discussed below).
- **Possible public, private, domestic and international financing splits** should be explored that can then inform public investment management processes (see Function 2d) and financing strategies (see Function 3).
- **Project preparation processes and project pipelines** need to be defined, plus an enabling investment environment (see Function 1e).

While developing these investment strategies, Ministries of Finance should ensure they:

- **Give equal consideration to the operation and maintenance (O&M) costs of infrastructure alongside capital expenditure.** Infrastructure projects require more than a one-off capital injection and needs assessments often focus on capital spending. Depending on the type of infrastructure, O&M can be a significant cost factor (Hallegatte et al., 2019)—e.g. in water and sanitation it usually accounts for more than half of financing needs—yet needs assessments rarely assess or consider O&M spending when making strategic investment planning decisions. Meanwhile, different solutions to the same infrastructure problem can have vastly different maintenance costs (e.g. bus vs. light rail) (ibid.). Good maintenance can generate substantial savings. For instance, analysis of OECD countries suggests that each additional $1 spent on road maintenance saves $1.5 in new investments (Kornejew et al., 2019). For all these reasons, assessment of investment needs should take into account not only the cost of the initial investment but also the total cost, ensuring sufficient allocation of resources for O&M throughout the lifetime of a project.
- **Use investment plans to consider the socioeconomic consequences of the proposed investment.** The huge growth in some low-carbon industries and decline of others, particularly those related to fossil fuel production, will have consequences for skill requirements, employment and social security systems. To ensure an orderly and just transition and avoid unnecessary drains on social security systems, Ministries of Finance should actively manage those socioeconomic impacts (see section on just transition).
- **Use investment plans as an opportunity to provide clarity to investors about the country's preferred technology pathways** such as how and to what extent a country is planning on using hydrogen to decarbonize the transportation sector. To ensure alignment on priorities and avoid stranded assets, transparent communication of such technological choices is key (OECD, 2017b).

Exploring possible financing splits (even if indicative) as part of investment planning is particularly important to ensure that the public purse is not unduly burdened, and that the private sector can take on investment wherever possible. Strategic public investment is key to ensuring that riskier investments eventually become bankable for the private sector: by investing in relatively new solutions, markets and technologies (such as green hydrogen, carbon storage and low-carbon aviation) perceived as too risky by private investors, public investment can help them reach maturity, bringing down costs and risks and eventually crowding in private finance.

The High-Level Advisory Group (HLAG) on Sustainable and Inclusive Growth (World Bank, 2023) differentiates between four types of investment requiring different financing sources:

1. **Bankable investments,** where private returns exceed costs, should be financed by the private sector (mobilized by incentivizing policies and regulatory frameworks).
2. **Riskier investments** are attractive for private investors but will require de-risking, technical assistance, or grants from concessional resources (see also Function 1e).
3. **Public good investments** are not commercially viable if only private benefits are accounted for, but can be made viable through subsidy provision. This includes many investments in nature conservation and adaptation.
4. **Social investments**—compensation provided to support a just transition—must be financed by public sources (including concessional or grant support).

Barriers to action and ways to overcome them

Planning for, estimating and making investments happen is inherently complex. Investments of the scale needed face a wide range of barriers that are often inadequately considered in the planning process, including:

- **Economic and financial barriers,** including environmental externalities, resulting in the true costs not being borne by the investor, and imperfect financial markets that lack capital markets for long-term projects. Other barriers are the high cost of capital driven by information asymmetries and high interest and exchange rates, limited fiscal space, and limited availability of climate finance for adaptation and de-risking mechanisms.

- **Technological barriers,** such as limited information about the returns on new technologies and supply chain barriers in local markets.
- **Implementation barriers** caused by political instability, unreliable legal frameworks and limited availability of skilled labor.
- **Policy and regulatory barriers**, such as a lack of well-defined standards, and restrictive, overly complex or undefined regulations (NDC Partnership, 2022a).

It is important to note that barriers for adaptation and mitigation investments often differ. For instance, the often more complex nature of adaptation projects and lower perceived or actual returns make it more difficult to attract private capital for adaptation projects. The Climate & Development Knowledge Network (2013) provides an overview of barriers and explores which ones commonly apply to mitigation and/or adaptation projects.

The investment planning process itself can be complicated by a range of factors, particularly:

- **A lack of a clear climate plan or targets on which to base assessment needs.** Many climate strategies lack details on the specific sectoral targets and outcomes, including the type or amount of investments required to achieve them. Without a clear understanding of the country's ambitions and priorities, Ministries of Finance, working with other line ministries, will be unable to determine the infrastructure needs to realize those targets.
- **Insufficient data and capacity.** A lack of comprehensive data at the global, national and sectoral levels makes it difficult for governments to produce reliable estimates. In particular, estimates of investment needs for adaptation and resilience are at an early stage of development. This is complicated by a lack of tools to make informed investment needs assessment and investment decisions, meaning that investment planning has to be performed under high levels of uncertainty.

Steps that Ministries of Finance can take to tackle these barriers include:

- **Mapping barriers and identifying steps to overcome them**. As part of the investment planning process Ministries of Finance can proactively map potential barriers to investment and design mitigation strategies at the project, program or strategy level. NDC Partnership (2022b) provides a tool that can help with this process, consisting of four steps:
  1. Undertake desk-based research and stakeholder engagement to identify sector, program and project-level barriers
  2. Group high priority investments with similar barriers (e.g. those with similar financing requirements will have similar barriers)
  3. Scope instruments to address barriers, including possible financial instruments, equity investment, technical assistance, policy and regulatory revision
  4. Create a strategy using the solutions identified in step 3 to develop an enabling environment for investment planning.
- **Ensuring strong climate strategies.** Through strong involvement in climate strategies, Ministries of Finance can ensure that NDCs and high-level adaptation and mitigation targets contain sectoral targets, details on the outcomes needed to achieve those targets, and solid KPIs so they can serve as a solid basis for investment planning (see Function 1). If climate plans are not yet clearly defined, investment plans and climate targets can also be developed in tandem and inform each other in the process (NDC Partnership, 2022a).
- **Investing in investing.** Ministries of Finance should consider 'investing in investing', i.e. in the data, analytics and technical knowledge needed for informed investment needs assessments and investment decisions. This will also require the design of appropriate project and policy appraisal tools, and investment in the necessary expertise on the nature of the transition in specific sectors (see Capability 2). To obtain better data on climate, Ministries of Finance can ensure that national meteorological agencies are sustainably funded.
- **Iterating investment planning**. Considering needs assessment and investment planning as iterative

processes can help bridge data gaps and uncertainties. Countries' investment needs depend on many factors, including their economic situation, technological developments, climate ambition and progress on it, and their vulnerability to climate change. Changes to these factors could trigger the need for a new iteration of investment planning. Investment strategies should therefore be considered live documents that are updated regularly to take into account changing circumstances and progress, plus feedback from stakeholders and early lessons learnt (NDC Partnership, 2022a).

Developing countries can receive assistance and support from international organizations and initiatives, including the NDC Partnership and the Global Infrastructure Facility. For World Bank-financed countries, a new diagnostic tool, the Country Climate and Development Reports (CCDR), can help to provide data on investment needs. CCDRs are "designed to tackle disconnects between climate and development policies, identify the highest-impact actions to reduce greenhouse gas emissions and build resilience" (World Bank, 2022a). Their aim is to inform policy and institutional reform and public and private investment in line with climate action and development. Reports contain a range of country-level climate, sectoral and development metrics, including data on investment needs assessments and priority investments. The publicly available reports will be rolled out to all WBG countries and will be particularly helpful for providing more granular data on financing needs for adaptation and resilience.

Real world examples

A growing number of countries are undertaking dedicated needs assessments and investment plans for NDC implementation, often led by Ministries of Finance. For example:

- **Rwanda**, led by the Ministry of Finance, has identified NDC-related investment needs as part of its NDC Implementation Framework. Rwanda aligned key sectoral KPIs and NDC objectives to create related initiatives and estimated their costs. The total investment needed to achieve NDC adaptation interventions and 2030 goals was estimated at $5.3 billion, including investments in agriculture, water, transportation, human settlement, land and forestry and other sectors. The estimated costs per project were included in the framework with specific costs varying depending on the level of project preparedness. The funding will rely on internal funds, external financial support and co-financing. A specialized green fund called FONERWA was created to mobilize the funds, attract climate investments and mainstream NDC investment planning into public budgets. FONERWA is also responsible for mobilizing international and donor funding for the NDC (see Box B2).
- In **Saint Kitts and Nevis**, the Department of Environment is the NDC lead agency and responsible for the NDC Implementation Plan. It systematically identified sector-specific barriers to the necessary investments needed for the implementation of the NDC, which were matched with capacity needs, drawing out the type of technical assistance and financial instruments to target barriers. It identified the following barriers to the adoption of electric vehicles (EVs): high upfront costs, even if maintenance costs are lower than for fossil fueled cars; a lack of charging infrastructure; a lack of public awareness of the technology and its benefit; a lack of appropriate EV models on the local market. Solutions included an EV inventive through a fuel tax and awareness campaigns on the benefits of EVs, facilitation of the roll-out of charging points by easing building codes in cities to open up more spaces for charging stations, and exploring public–private partnerships to set up charging infrastructure (NDC Partnership, 2022a).
- **Spain's** National Energy and Climate Plan (NECP) includes measures to decarbonize the economy across sectors covering energy, transportation, industry, buildings, agriculture and waste. The NECP is mandated by the European Union to each of its member states as a way for it to meet the EU-wide NDC. Spain's NECP is complemented by an investment needs assessment, with a total investment of €236.1 billion identified as being needed up to 2030. Most of this is needed for energy savings and renewables, followed by power

networks and the electrification of the economy; 80% is expected to be financed by the private sector. An Inter-ministerial Committee on Climate Change, which includes the Ministry of Finance, is responsible for oversight and governance of the NECP's development (Coalition of Finance Ministers for Climate Action, 2020a).

Other examples of NDC investment planning can be found in NDC Partnership (2022a) and in the reports produced by Helsinki Principle 6.

Evidence of coordinated long-term investment planning for the transition beyond 2030 is limited and the majority of LTSs lack the granular information needed to inform investment planning. While the foundation to redirect investments at the scale needed is generally lacking, some countries have advanced work in this area. For example:

- **Cambodia** assessed the investment needed for the LTS and estimates that almost $9 billion in public financing will be required for the 2025–2050 period. New public borrowing, shifts in public spending on economic services, and policy reforms in the transportation sector are estimated to cover 74% of the total requirements, with international climate finance expected to meet the rest.
- **Costa Rica's** National Decarbonization Plan sets out plans for achieving net zero emissions by 2050. The National Development Public Investment Plan (PNDIP) acknowledges the significance of intersectoral implementation and provides detail about policy alignment. The key sectors for implementation include transportation and sustainable mobility, waste management, agriculture and land-use change. The decarbonization plan is used for the PNDIP (2019–2022), to assess the investment needs and strategic areas. The Ministry of Finance participates in allocating resources to investment projects and monitoring budget execution.

Some countries are now starting to consider sectoral and cross-sectoral financing and investments needed for the transition. For example, in 2022 Finland set up a cross-ministerial working group between Ministries of Finance, Environment and Economy and Employment to jointly assess the country's green transition financing and investment needs, plus barriers to investment and how they can be removed.

Box B2. Rwanda: The role of the Ministry of Finance and Economic Planning in driving climate action and investment

Strategic planning and investment

The Ministry of Finance and Economic Planning (MINECOFIN) in Rwanda is actively involved in driving climate action and collaborating with other ministries and stakeholders to achieve common climate goals. The Ministry is engaged in the Long-Term Strategy 2050, the Green Growth and Climate Resilience Strategy and NDC planning and implementation as part of the public investment committee, which is instrumental in approving financing and budgeting for public projects and consists of several key line ministries. MINECOFIN supports other ministries in tagging and identifying projects that meet economic, social and environmental criteria based on environmental impact assessments (EIAs). It is also looking to prioritize projects that can have a Keynesian multiplier effect, to address climate change and at the same time reduce inflation.

Leading on investment planning, the Ministry aims to mobilize $11 billion (8.8% of GDP on average) in investments by 2030 to develop climate-resilient infrastructure to achieve the NDC targets. With the Ministry of Environment, it also tracks the investments of the NDC Implementation Framework. The Ministry has aligned key sectoral KPIs and NDC objectives with related initiatives and estimated their costs, calculating that the total investment needed to achieve NDC adaptation interventions in line with 2030 goals is $5.3 billion across key sectors of the economy.

Implementing green policies

The Ministry has introduced fiscal policies to support climate action such as green budgeting to make sure that publicly financed projects meet decarbonization, sustainability and social responsibility criteria. It is working on a climate budget tagging system to improve allocation and monitoring of climate-related expenditure, an action point related to the need to monitor NDC implementation.

Rwanda was the first country in Africa to remove all taxes, import and excise duty and VAT on electric vehicles, their components and charging stations. These initiatives are supported by the development of an EV startup ecosystem. While it remains a challenge to develop EV infrastructure in a small country like Rwanda, these first steps are already making EVs more accessible to people and are encouraging investments in the sector. For example, Africa's first electric motorbike startup, Rwanda-based Ampersand, was named as one of the World Economic Forum's Technology Pioneers in 2022. The motorbikes can produce 75% less lifecycle emissions than petrol/gasoline motorbikes from grid power and 98% less when run on renewables (Whiting, 2022).

The depletion of natural capital such as forests, water, minerals, biodiversity and land poses a significant challenge to achieving poverty reduction and sustainable development objectives. MINECOFIN has begun to put a value on Rwanda's natural capital to mitigate those risks and modify Rwanda's strategic KPIs monitoring using a 'Green GDP' instrument. Once natural capital is included in the accounting, Rwanda can incorporate this form of wealth into its macroeconomic framework by calculating an environmentally-adjusted net domestic product. This approach enables Rwanda to calculate, publish and monitor its green GDP.

National and international collaboration

Together with the Ministry of Environment, MINECOFIN participates in Rwanda's international climate engagements. For instance, Rwanda is one of the pioneering members of the Taskforce on Access to Climate

Finance. The taskforce, launched at COP26, aims to trial new approaches of access to climate finance built on feedback from developing countries and institutions involved in project financing. It aims to enable Rwanda to have greater access to larger investments for a pipeline of projects and provide more flexibility in funding climate-resilient solutions and projects.
Rwanda was the first African country to benefit from the IMF's Resilience and Sustainability Trust (RST). The agreement will give Rwanda access to SDR 240.3 million (about $319 million) in climate finance, which will significantly help the country finance its climate change mitigation projects.

At the domestic level, the Ministry collaborates with other line ministries and particularly the Ministry of Environment to drive climate finance. For example, the Rwanda Green Fund, FONERWA, the largest climate change investment fund in Africa, was launched in 2012 and has mobilized about $216 million in domestic and international finance and created more than 140,000 green jobs. It serves as a bridge between the MINECOFIN and the Ministry of Environment, the lead agency on climate to which the fund is attached. Through the fund, MINECOFIN mobilizes finance for climate action using financial instruments such as grants and credit with the objective of achieving 30% coming from private investment. Achieving multiplier effects from private green finance is challenging due to the high perceived risk of such investment and low credit ratings, a barrier Rwanda is trying to overcome.

Conclusion and lessons learnt

As the fastest growing economy in Africa, Rwanda has a strong commitment to building a sustainable economy and leading efforts on climate finance readiness. Despite the limited capacity of the Ministry of Finance to act on climate change, it has played an instrumental role in facilitating greater access to international climate finance and allocating domestic public finance in a more efficient and sustainable manner. Key to this has been adjusting MINECOFIN's core functions to include climate and actively collaborating with other ministries and international stakeholders.

Source: Prepared by the Rwandan Ministry of Finance and Economic Planning

Opportunities for action

Ministries of Finance should be engaged in the development of plans for sustainable and resilient investment as part of or connected to climate strategies. In particular, Ministries of Finance should consider:

- Making a comprehensive assessment of investment needs to reach climate targets across sectors and the economy as a whole, and based on those, develop investment plans—together with relevant line ministries.
- Ensuring that clear governance and institutional arrangements are set up, with stakeholder engagement plans to ensure the regular involvement of key stakeholders inside and outside government, including relevant line ministries, the private sector, civil society and academia.
- Treating investment planning as an iterative process, to enable the continuous updating of plans as targets change and better data and tools become available.
- 'Investing in investing', including by building the necessary expertise and infrastructure that will enable them to make informed needs assessments and investment decisions.

Function 1e. Identifying and developing bankable projects and programs

Context and role of Ministries of Finance

Developing sustainable, resilient and inclusive investment plans is only the first step in mobilizing investment. In a next step, project preparation and the development of project pipelines are essential—particularly to ensure the realization of high priority projects. Project preparation in this context can be described as the process of "translating investment needs into specific investment projects that are ready for financing and implementation" (NDC Partnership, 2022b).

Key to this is the development of a low-carbon, climate-aligned project pipeline, defined by the OECD as: "…a set of infrastructure projects and assets (accounting for the existing stock of assets), and future assets in early development and construction stages prior to project commissioning, typically presented as a sequence of proposed investment opportunities over time that align with and are supportive of long-term climate and development objectives" (OECD, 2018a). A project pipeline can help to: promote investment in 'suitable' projects across priority sectors; accommodate the requirements of investors; and allocate project preparation support to projects that are not yet bankable but considered strategic (ibid.).

Governments need to significantly increase the attention they give to translating their investment planning decisions into concrete programs and project pipelines. The reason that investments currently fall short of what is needed is not a lack of finance but "because there are not enough identifiable, investment-ready and bankable projects to which private sector investors and project developers can commit time, effort and funding" (ibid.). Consequently, it is not always clear what projects are needed, where and when, how they will be financed, or if they are aligned with long-term objectives; this makes it difficult to match investment needs with investors. This step in developing investment strategies is often done last, with greater attention given to identifying policies and financial instruments capable of unlocking investment at scale. However, equal attention should be given to identifying viable projects and designing project pipelines.

Project preparation includes a variety of steps, not all of which can be discussed in this guide. In addition to prioritization and pipeline development, they include key project-level steps such as pre-feasibility and feasibility studies, and project review, audit and approval. The Global Infrastructure Hub's Project Preparation Reference tool (GI Hub, 2019) discusses these different components.

Project preparation is essential for preparing 'bankable projects'. A project pipeline "can only be as robust as the (investment-ready and bankable) projects that constitute it, as effective as institutions that deliver it, and as ambitious as the objectives to which it is linked" (OECD, 2018a). In a traditional sense, a bankable project is one that a lender is willing to finance, i.e. that is assumed to generate enough return to justify the risk being taken. For climate-related projects, the definition of bankability should go beyond the focus on financial returns and capture the social and environmental benefits of projects (Ellis and Pillay, 2017); it depends on a range of factors, including the type of financial instruments chosen, the funder (public, private or blended), and the type of project (e.g. adaptation or mitigation focused) (ibid.). Bankability should not be an afterthought but discussed from the beginning of the pipeline development stage.

Project pipelines are a key tool for prioritizing strategic projects. Given the urgency of the climate crisis, identifying and fast-tracking strategically valuable projects—the most impactful investments for achieving climate and other national targets in key sectors—will be essential to making rapid progress. Priority projects will differ in each country but are likely to heavily feature power generation and electrification, and adaptation, particularly

in climate-vulnerable countries (see Part A). Prioritization requires a clear shortlist of prioritized projects, and an open participatory, multi-criteria and transparent prioritization mechanism, along with dedicated project preparation support facilities to ensure that prioritized projects can be implemented (see below). For instance, the EU has a system to fast-track the development of strategically important projects in low-carbon technologies and network infrastructure within the bloc (OECD, 2018a).

Ministries of Finance can play a key role in project preparation and the development of project pipelines, in a leadership or supportive role, by ensuring cross-agency collaboration, bringing in cross-sectorial insights, and engaging with the financial sector.

Several areas of best practice can inform the design of project programs and pipelines. There is no one-size-fits-all approach, as every approach will depend on each country's individual circumstances. However, the OECD (2018a) has gathered numerous criteria for designing robust project pipelines. It finds that governments can develop robust programs and pipelines of projects if they take into account the following factors:

- **Leadership:** Link policymaking to strategic objectives and the programs and institutions to deliver them, providing overall coordination and leadership to champion project pipelines.
- **Transparency:** Focus on strengthening the interface and mechanisms that governments employ to disseminate information and convene stakeholders, developing transparent processes and communicating relevant information on projects and the pipeline to the financing and investment community.
- **Coordination:** Take a holistic, whole-of-government approach to infrastructure planning and investment, feeding lessons back into policymaking processes to bolster the investment-enabling environment and providing funding or institutional support to projects when appropriate.
- **Prioritization:** Fast-track suitable infrastructure project investment that brings the carbon and energy intensities of the country's economy to target levels and strengthen resilience and adaptive capacities, prioritizing the deployment of 'high-value' and strategically important projects and sectors.
- **Eligibility criteria:** Foster the development of a diverse set of bankable projects and promote business models suitable for private sector needs, setting strong eligibility criteria to determine which projects should be built and supported and which should not.
- **Resilience:** Increase country resilience to changes in climate and development needs, deploying infrastructure that remains pertinent and relevant over time and tailored to changing external conditions, and avoiding expensive path dependency or lock-in.

Beyond support for individual projects and project pipelines, project preparation should also consider the broader investment environment, for example by:

- **Identifying fiscal and financial policies that support the investment strategy and its implementation**. This includes policies that provide clear signals to accelerate the drive to net zero emissions, for example carbon pricing, fossil fuel subsidy reform, and reforms to public procurement (see Function 2). It also includes the dedicated public and private financing mechanisms to raise the resources needed for investment (see Function 3).
- **Stable institutions and a supportive broader regulatory environment.** The strength and quality of institutions will determine the effectiveness of policies designed to unlock good-quality sustainable infrastructure investments. This includes relevant regulations and legislation, supportive fiscal and structural policies, and sound frameworks for procurement and public–private partnerships. Strong institutional arrangements can also help governments take a longer-term view and overcome the short-termist nature of politics that might otherwise hinder the implementation of investments. Investment decisions are influenced by many regulatory factors, the quality and speed of public administration and different rules and administrative procedures.

Divergent, overlapping, contradictory or constantly changing regulations can impose additional costs and impede investments from happening (OECD, 2014). Sustainable infrastructure investments, such as solar or wind energy projects, are often hampered by cumbersome approval procedures, which can delay projects by years, or can even be the reason that smaller projects do not go ahead at all (OECD, 2017b). The energy transformation in countries like Uruguay and Morocco would not have happened without changes to regulation (see Box B4). Key elements for strong institutions have been set out by the IMF and OECD (OECD, 2020a; Schwartz et al., 2020). Meanwhile, country platforms can help accelerate action in the near term (see below and Function 3).

Barriers to action and ways to overcome them

Several barriers can prevent Ministries from Finance from developing or supporting robust project pipelines with bankable projects that can promote investment in the transition to net zero and enhancing resilience:

- **Lack of alignment with climate plans.** Where infrastructure project pipelines exist, they can be inconsistent or misaligned with long-term climate plans, resulting in the implementation of projects that can become stranded assets and hinder countries' ability to reach climate targets (OECD, 2018). It is therefore important to climate-proof existing project pipelines.
- **Lack of tools to prioritize climate projects** (see also Function 2c).
- **Lack of transparency.** While in theory the purpose of project pipelines is to increase clarity and transparency, in practice investors still struggle to identify suitable projects. This can be due to the varying nature of pipelines between countries, and a lack of clarity in pipeline development (OECD, 2017a).
- **Cost of project preparation**. Project preparation can be very costly and thus ensuring the bankability of projects is a significant task. Estimates suggest that they make up typically 3–5% of total investment costs in developed countries, and up to 10% in developing countries (GI Hub, 2019).
- **Difficulty of making institutional reforms**. Implementing or reforming the institutions required for a good investment environment does not happen overnight and is a process fraught with many challenges.

Recognizing both the challenges and the importance of project preparation, some countries, MDBs and other development partners have set up Project Preparation Facilities (PPFs) and other support facilities. PPFs are entities that provide technical and/or financial support to cover activities that support the various stages of project preparation, such as project feasibility studies or value-for- money analysis. They are particularly useful for shepherding priority projects through the relevant processes. PPFs are usually offered by public finance institutions, and they provide technical assistance support to attract investments, facilitate feasibility studies and increase the overall bankability of projects.

Examples of PPFs in developing countries focused on climate include the Green Climate Fund Project Preparation Facility, which assists developing countries that are part of the UNFCCC, and Cities and Climate Change in Africa (CiCLIA), managed by the Agence Française de Développement. In Latin America the NDC Pipeline Accelerator assists national and sub-national entities, both public and private, to plan and design investments in infrastructure, agriculture and land-use management that are aligned with their NDCs and other national climate and sustainable development objectives.

Governments are also increasingly setting up Project Development Funds (PDFs) to finance project preparation, often specifically for public–private partnerships (PPPs), which come with higher-than-average project preparation costs. Some have a specific sector or thematic focus, e.g. on renewable energy projects (GI Hub, 2019). Even in the case of PDFs and PPPs, project preparation costs will also have to be funded directly through the government

budget. Ministries of Finance can ensure that sufficient finance is directed toward project preparation, and that this happens in an efficacious way, including by tracking expenditure and outcomes (ibid.).

The IMF's Climate Public Investment Management Assessment (PIMA) framework, which now includes a climate component, can help countries assess their infrastructure governance institutions in a comprehensive fashion and design a tailored and prioritized action plan (see also Function 2d). To address barriers around institutional reform, country platforms have recently emerged as a model to accelerate investments in support of NDCs. Particularly in countries with weak institutional environments, country platforms can be set up to drive key sectoral transitions by fostering sound investment decisions, necessary policy actions and governance arrangements, and mobilization of finance at scale through better coordination of key stakeholders (see Function 3).

Real world examples

There is no one-size-fits-all method to building infrastructure project pipelines and supporting the development of bankable projects. Planning efforts always depend on country context, including their starting point, targets and institutional and financial characteristics. However, there are examples of good practice countries can learn from, covering different aspects of the issues discussed in this section.

Several countries have put together project pipelines that clearly lay out priority action, which can serve as useful examples for Ministries of Finance. For instance:

- **Kiribati's** NDC Investment Plan includes a project pipeline that consists of 15 'primary mitigation opportunities'—projects worth an estimated $210.5 million—in the two priority sectors of transportation and energy.
- **São Tomé and Príncipe** has developed a detailed road map laying out costed projects and actions across three stages and three time-horizons between 2017 and 2031. The three stages are: 1) building national implementation capacity; 2) implementing projects that enhance resilience and reduce vulnerabilities, particularly in coastal zones; and 3) enhancing resilience at sectoral and community levels (NDC Partnership, 2022a).

In some cases, new cross-agency entities have been built to coordinate and speed up investments. For instance:

- **Indonesia** established the Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) in 2014. An inter-ministerial body that includes the Ministry of Finance and two other ministries, the KPPIP coordinates infrastructure planning by identifying and prioritizing the most beneficial projects. The KPPIP delivers and monitors a pipeline of national strategic projects and a pipeline of priority projects, geared to furthering the objectives of Indonesia's national development plans (OECD, 2018a).
- In **Colombia**, the Inter-Sectorial Commission on Climate Change (CICC) plays a similar role to the Indonesian KPPIP.
- The **United Kingdom's** efforts to kickstart the offshore wind energy market is a good example of a government providing dedicated project support. Despite the country having an excellent wind energy potential, development of bankable offshore wind energy projects has been greatly hindered by prohibitively large investment barriers facing early-stage projects. To support the development of offshore wind, the UK took

measures including establishing dedicated public institutions such as the UK Infrastructure Bank, which provides loans and equity investments to green infrastructure projects, and specific policy measures to target cost barriers, most recently 'Contracts for Difference' that set a 'strike price' per unit of energy, offering price predictability. As a result, the UK now regularly scopes top positions in the EY Renewable Energy Country Attractiveness Index and is considered the leading country for offshore wind development (OECD, 2018a).

- The **Mexico** Projects Hub, operated by the development bank BANOBRAS, links critical infrastructure and energy projects with national and foreign investors, encouraging long-term financing by providing an infrastructure project pipeline.

Some governments also host their own Project Preparation Facilities or Project Development Funds. Examples of PPF units that are hosted by national government departments are the PPP Unit in **South Africa** and the PPP Unit in **Egypt**, both established by Ministries of Finance to support public finance management and coordination between line ministries and the private sector. While these units tend to focus on general infrastructure development projects, there is an opportunity to incorporate climate into their work to facilitate climate investments and the transition to net zero.

Opportunities for action

In collaboration with other ministries, Ministries of Finance should build mechanisms for translating investment planning decisions into concrete programs and pipelines of projects that prioritize strategic projects. In particular they should consider:

- Ensure the bankability of strategic projects, including by considering setting up in-house project support facilities or integrating climate into existing ones, and by providing relevant policy and institutional support.
- Create project pipelines that contain a clear prioritization of projects.
- Strengthen the overall investment climate, including through setting up country platforms where appropriate (see Function 3).

Function 2. Reforming fiscal policies

Helsinki Principles 3 and 4

Function 2 explains how Ministries of Finance can use fiscal policy levers and the budget process to drive climate action across a wide range of policy areas.

It covers 1) reforming tax systems and macroeconomic incentives through carbon pricing, subsidy reform and other fiscal policy measures (Functions 2a and 2b), and 2) mainstreaming climate in the budget, including through greening public investment management and using public procurement (Functions 2c–2e).

Introduction: The need for reinforcing packages of fiscal policy measures

Delivery on the goals of national climate strategies will require structural transformation of the economy in all key systems and sectors. This transformation demands that governments and Ministries of Finance introduce fiscal and other policy measures capable of catalyzing the development of new low-carbon, climate-resilient sectors. It equally demands measures capable of overcoming common market and non-market failures that hold back investment in key sectors, such as the impacts of emissions, knowledge spillovers, infrastructure lock-in, network externalities, co-benefits, split incentives, information costs, and coordination problems (Stern, 2022).

This implies a wide-ranging role for fiscal policies, cutting across the core tax and budget management functions of Ministries of Finance to shape economic incentives and to provide sufficient resources for climate action and investment. Many of these instruments act as fiscal tools and shape economy-wide or sector-specific incentives at the same time, and many can be used to drive both mitigation and adaptation outcomes. The presence of multiple market failures means there are no 'silver bullets' to climate policy. Policies such as carbon pricing or subsidy reform are important and necessary but often need to be complemented by other reinforcing policies.

1) Reforming tax systems and macroeconomic incentives

Function 2a. Transforming economic incentives through carbon pricing, subsidy reform and other fiscal policy measures

In this subsection we address:

i. Carbon taxes and pricing, subsidy reform, and frontiers in environmental taxation
ii. Creating fiscal incentives and regulations for transforming key sectors
iii. Combining instruments into smart policy packages to drive transformation

i) Carbon taxes and pricing, subsidy reform, and frontiers in environmental taxation

Context and role of Ministries of Finance

Establishing carbon pricing (through taxation or trading schemes) and reforming fossil fuel subsidies are central pillars of climate policy and require active involvement by Ministries of Finance. Both these instruments have the potential to transform economy-wide incentives to deliver on national climate objectives while raising or saving significant government revenues. For example, recent analysis suggests a $50 per tonne carbon price in

2030 could generate revenue increases of around 1% of GDP for many G20 countries and substantially more than that in a few cases (IMF/OECD, 2021). Neither carbon pricing instrument is the whole solution, but both are an important part of the armory all Ministries of Finance should consider and can contribute to reaching mitigation goals in cost-effective ways adapted to individual and local circumstances.

Explicit carbon pricing schemes typically take two forms: a carbon tax or an emissions trading scheme. A charge on the carbon content of fossil fuels, a carbon tax is potentially the most efficient and easiest to administer through existing excise taxes. Carbon taxes can be administered upstream, where fossil fuels are extracted, or downstream, where emissions are generated. An upstream carbon tax has the advantage of being capable of conferring a whole-of-economy price incentive that will impact both the formal and informal economy. The alternative, an emissions trading scheme/system (ETS), is typically applied downstream, pricing carbon in selected carbon-intensive industries. Typically, it consists of setting a medium-term goal for greenhouse gas emissions, identifying a list of emitters to participate in the scheme, allocating permits to these participants, requiring them to hold enough permits to cover their emissions, and then allowing them to trade the permits with each other.

These different pricing systems have their advantages and disadvantages, which need to be considered in the context of national circumstances. A carbon tax fixes the carbon price but leaves emissions uncertain. The risk is that targets are not achieved. An ETS fixes the quantity of emissions but leaves the carbon price uncertain and volatile. This can be challenging for business planning and the permits are often open to lobbying. Both forms of uncertainty can be mitigated with a well-designed system. It is possible to have both an ETS and a carbon tax if the domestic or regional market is large enough, as in the EU and Mexico. The IMF recently produced a useful summary comparing the characteristics of carbon taxes with those of emissions trading schemes (Parry et al., 2022)—see Table B1—which can be used to help make the choice between a tax and an ETS or to understand the synergies between the two.

Table B1. Summary comparison of carbon taxes and emissions trading systems (ETSs)

Design issue	Instrument	
	Carbon tax	ETS
Administration	Administration is more straightforward (for example, as extension of fuel taxes)	May not be practical for capacity constrained countries
Uncertainty: price	Price certainty can promote clean technology innovation and adoption	Price volatility can be problematic; price floors, and cap adjustments can limit price volatility
Uncertainty: emissions	Emissions uncertain but tax rate can be periodically adjusted	Certainty over emissions levels
Revenue: efficiency	Revenue usually accrues to finance ministry for general purposes (for example, cutting other taxes, general investment)	Free permit allocation may help with acceptability but lowers revenue; tendency for auctioned revenues to be earmarked
Revenue: distribution	Revenues can be recycled to make overall policy distribution neutral or progressive	Free allowance allocation or earmarking may limit opportunity for desirable distributional outcomes
Political economy	Can be politically challenging to implement new taxes; use of revenues and communications critical	Can be more politically acceptable than taxes, especially under free allocation
Competitiveness	Border carbon adjustment more robust than other measures (for example, threshold exemptions, output-based rebates)	Free allowances effective at modest abatement level; border adjustments (especially export rebate) subject to greater legal uncertainty
Price level and emissions alignment	Need to be estimated and adjusted periodically to align with emissions goals	Alignment of prices with targets is automatic if emissions caps consistent with mitigation goals
Compatibility with other instruments	Compatible with overlapping instruments (emissions decrease more with more policies)	Overlapping instruments reduce emissions price without affecting emissions though caps can be set or adjusted accordingly
Pricing broader GHGs	Amenable to tax or proxy taxes building off business tax regimes; feebate variants are sometimes appropriate (for example, forestry.)	Less amenable to ETS; incorporating other sectors through offsets may increase emissions and is not cost effective
Global coordination regimes	Most natural instrument for international carbon price floor	Can comply with international price floor; mutually advantageous trades from linking ETs but does not meet global emissions requirements

Note: Green indicates an advantage of the instrument; blue indicates neither an advantage nor disadvantage; white indicates a disadvantage of the instrument.
Source: Parry et al. (2022), reproduced with permission

The macroeconomic effects of introducing both systems of carbon pricing tend to be modest and sometimes positive (Bhattacharya et al., 2021; IMF, 2019a; Venmans et al., 2020; World Bank, 2019). The price effects on carbon-intensive goods and services are typically offset in the medium term by productivity gains. Most ex-post evidence from high- and middle-income countries suggests competitiveness concerns tend not to materialize and the overall effect on economic activity is positive, albeit with prices implemented by many countries typically at modest levels (ibid.). The tax yields can also be considerable, depending on the price set, and can provide budgetary resources for expanding public investment and social transfers, which would enhance the acceptability of higher taxes. Carbon taxes generate important environmental and other co-benefits not reflected in national accounts. These can include contributing to measures that lower levels of air pollution, reduce congestion, and improve health outcomes, and these welfare benefits can offset any potential temporary dampening effects on economic activity (ibid.).

Subsidy reform is an important precursor for Ministries of Finance to consider alongside carbon pricing. Subsidies for fossil fuel consumption and production act as a negative carbon price and can have considerable welfare costs (Parry et al., 2021). G20 governments provided an average of $584 billion annually in 2017–2019 through direct budgetary transfers and tax expenditure,[22] price support, public finance, and investment by state-owned enterprises (SOEs) for the production and consumption of fossil fuels at home and abroad. Governments gave more support to oil and gas production than any other fossil fuel-related activity, at $277 billion (IISD and ODI, 2020). Some estimates suggest that globally, subsidies could be as high as nearly $6 trillion or around 7% of global GDP when including environmental costs and foregone consumption taxes (Parry et al., 2021). There are currently few signs of there being a marked drop in these levels over time, additional funding having been committed during the COVID-19 pandemic and since the current energy crisis in natural gas markets (O'Callaghan et al., 2022a).

Eliminating fossil fuel subsidies has the potential to save significant government revenues. These savings can be used to spur growth-enhancing tax reform, to ensure a just transition, and to invest in basic infrastructure, education, poverty reduction and climate resilience. Empirical results indicate that pricing carbon and the removal of fossil fuel subsidies could generate an estimated $2.8 trillion in government revenues in 2030, more than the GDP of India today (New Climate Economy, 2018). Similarly, Parry et al. (2021) find that subsidy reforms could generate annual global carbon emission reductions of up to 36% and increase in government revenues of about 3.8% of GDP, preventing nearly one million deaths from local air pollution.

Carbon pricing is widely regarded as a central policy for supporting mitigation strategies, playing an important role in delivering near-term emission cuts. Recent analysis by the IMF and World Bank for the Coalition suggests that if a carbon price of $75 per tonne were adopted by all countries, it could cut emissions in line with what is needed to limit warming to 2°C (Black and Parry, 2020); this is consistent with the mid-point of previous estimates (Stiglitz and Stern, 2017). Multi-country empirical studies suggest that each additional $10 of carbon price cuts emissions by about 4 to 8% in the long run (Sen and Vollebergh 2018; Kohlscheen et al., 2021; D'Arcangelo et al., 2022; Metcalf and Stock, 2020).[23] Individual empirical studies for countries with substantial carbon prices such as Sweden and Finland have shown that carbon prices have played an important role in decoupling emissions and GDP growth (for example, in Finland leading to an emissions cut of 35% over 15 years compared with a counterfactual without pricing [Andersson, 2019; Mideksa, 2021]).

However, carbon pricing alone is unlikely to be sufficient for achieving the pace and scale of sustained emission cuts needed for 1.5°C and global net zero, due to other market failures (see Box B3). In particular, carbon pricing—especially at modest levels—may not promote the system changes needed at a fundamental level to transform a wide range of sectors, particularly hard-to-decarbonize sectors like aviation, heavy industry, and building energy efficiency (Heal and Schlenker, 2019; Rosenbloom, 2020). The IPCC recently concluded that "carbon pricing is effective in promoting implementation of low-cost emissions reductions (high confidence)",

[22] Tax expenditure makes up one of the largest components of fossil fuel subsidies worldwide, yet this expenditure remains underreported in many jurisdictions and often evades regular evaluation procedures. It should be a priority in the reform process (OECD, 2021e).

[23] There are some outliers in the multi-country analyses on both the up- and down-side compared within these figures. For example, Best et al. (2020) find around a 2.75% reduction in *annual* emissions growth from an additional $10 carbon price (which would entail much larger cuts in emissions over time), while Rafaty. Dolphin and Pretis (2020) find around a 0.5% cut in *total* emissions growth.

but "is limited in its effect on adoption of higher-cost mitigation options, and where decisions are often not sensitive to price incentives such as in energy efficiency, urban planning, and infrastructure (robust evidence, medium agreement)" (IPCC 2022). Additionally, there are political obstacles to implementing pricing at a sufficiently high level, such as concerns about the competitiveness of energy-intensive exporting industries or import-competing industries.

Box B3. Why Ministries of Finance should supplement carbon pricing and subsidy reform with other policies

A package of different policy interventions will often need to be considered by Ministries of Finance and line ministries to address market failures and other barriers to the low-carbon transition. Carbon pricing is principally designed to address the negative externality associated with greenhouse gas emissions, which is not factored into the costs of businesses. However, there are many further market and non-market barriers to the transition, which means carbon pricing and subsidy reform have to be complemented by a range of other measures, such as fiscal incentives and regulations to encourage the growth of new green sectors.

- **Innovation spillovers.** The social returns to innovation exceed the private returns as new knowledge from research, development and deployment spreads across firms and sectors (Stern and Valero, 2021).
- **Infrastructure lock-in.** Legacy infrastructure, the associated incumbent technologies, and the current spatial pattern of development create huge inertia (Grubb et al., 2014), which typically results in a lack of low-emissions alternatives, e.g. inadequate public transportation for vehicle owners to switch to.
- **Low responsiveness to carbon prices.** There is low responsiveness in some sectors due to a low share of energy costs in total costs, inelastic demand, and non-price barriers, e.g. a lack of public transportation choices, and the time cost of commuting inhibits responsiveness to fuel taxes.
- **Network externalities.** The benefits to an individual depend on how many others are using the product or service, e.g. new infrastructure requirements or expansion of EV use may depend on the availability of EV charging infrastructure, which in turn depends on the number of EVs in use.
- **Public goods.** Some forms of sustainable infrastructure are public goods, which means the benefits cannot be fully captured by private investors, leading to under-provision or undersupply of capital.
- **Equity impacts.** Low-emission policies can impact adversely on the welfare of individuals, groups or regions, and accompanying policies to address this will often be warranted.
- Co-benefits. Low-emission policies, e.g. reducing fossil fuel use, result in positive externalities in the form of reduced air pollution and health benefits in addition to the climate benefits.
- **Split incentives.** These occur where the returns to a socially efficient mitigation investment accrue to a different party, which can inhibit investment. An example is a landlord investing in the energy efficiency of a building, the benefits of which are experienced by the tenant rather than the investor.
- **Information costs and gaps.** Businesses and consumers may lack sufficient information on energy efficiency and other low-carbon options or may be short-sighted in their decision-making.
- **Financing constraints.** An inability to borrow may constrain investments in low-emission technologies where their upfront costs are higher but recurrent expenditures are typically lower.
- **Coordination.** The fundamental economic transformations required necessitate coordinating the actions of all decision-makers across the public and private sectors, and households.

These market and non-market barriers mean that carbon pricing and subsidy reform have to be complemented by a range of other measures, such as fiscal incentives and regulations to encourage the growth of new green sectors.

Source: Based on a contribution from Murray Petrie (Expert Advisory Group)

Carbon pricing should therefore be complemented with other measures, including to enhance the responsiveness of the economy to carbon pricing. For these reasons and others, the IMF and other prominent institutions and individuals (e.g. Black et al., 2021; IMF, 2019a; OECD, 2022d) recommend:

- **Phasing-out pre-existing fossil-fuel subsidies** as a precursor to pricing. These subsidies tend to be costly for the national fiscus, regressive, and are widely acknowledged to be economically inefficient.
- **Ensuring that carbon pricing systems are well designed,** to make the reforms needed for implementation socially just, politically acceptable and inclusive, in addition to environmentally effective and economically efficient. Of particular importance for a just transition is targeted support (through transfers, tax credits or retraining) for vulnerable and most affected groups. To unlock new investment and enhance the responsiveness of economic actors to carbon pricing (and to potentially trigger non-linear responses), it is also very important that governments commit to a long-term, predictable pathway for prices.
- **Complementing effective carbon pricing with other instruments to accelerate decarbonization**, especially in high abatement-cost sectors. These include: feebates in sectors like transportation and buildings, technology policies such as subsidies and tax incentives for low-carbon R&D to drive innovation, public investments in complementary enabling infrastructure (e.g. in clean mobility and grid infrastructure), and regulatory reforms such as energy market reform or setting end dates on the sale of fossil-fuel-based transportation modes. These policies can help address the additional market failures that are preventing rapid decarbonization (see Box B3).
- **Working internationally** to explore the collective introduction of carbon price floors and carbon border adjustments to alleviate competitiveness concerns (while addressing international equity considerations). A recent report by the Coalition's Helsinki Principle 3 workstream (2023) explores recently proposed coordination regimes including a carbon price floor, elaborated on further by an IMF staff proposal for a global carbon floor price of at least $25–75/t$CO_2$, with the precise level depending on the economic development stage of the country (IMF, 2021).

Barriers to action and ways to overcome them

Most countries have experienced challenges in ensuring the take-off of carbon pricing measures. Carbon tax and ETS arrangements now cover over 20% of greenhouse gas emissions, but where they do exist, prices are typically still well below the $50–100 per tonne price needed by 2030 for a 2°C warming scenario (Bhattacharya et al., 2021; Stiglitz and Stern, 2017; OECD, 2022d). For instance, only a few countries in Europe—Sweden, Finland, Norway, Liechtenstein, Switzerland and France—are in the target pricing range, although many of these schemes contain exemptions. In Latin America and the Caribbean, only five countries have a carbon tax, and these generally have low prices and design deficiencies (Eguino and Delgado, 2023).

Evidence suggests that this lack of take-off is due in large part to knowledge gaps, lack of acceptability, and design challenges. For instance, a survey of Coalition members in 2020 suggested that knowledge and data gaps were the main obstacles preventing reform or more ambitious coverage and pricing, along with concerns about the impacts of carbon pricing on equity, employment and competitiveness. Some concerns are especially pertinent for low-income countries where higher energy costs can have major implications for energy access, often tempered by the widespread use of fuelwood.[24]

[24] For example, a few African countries (e.g. Kenya, Ethiopia, Senegal, Burkina Faso and Côte d'Ivoire) have expressed interest in using carbon pricing approaches to achieve their NDCs. However, carbon pricing can be challenging to design and implement in countries like these due to gaps in human resources and knowledge, low per capita emissions and levels of industrialization that constrain domestic demand for carbon credits, and concerns about potential impacts on competitiveness, consumer prices and low-income households (Asafu-Adjaye et al., 2022). This can increase the attractiveness of supplying credits in international voluntary carbon markets in sectors such as Reducing Emissions from Deforestation and Forest Degradation (REDD+) (see section on voluntary carbon markets later in the guide), introducing carbon pricing at the regional level (e.g. ECOWAS/EAC), or phasing out fossil fuel subsidies.

To be effective, carbon pricing reforms need to be designed, communicated and implemented well. This includes highlighting the long-term benefits of climate action for the environment, public health and the economy, and carefully considering how to address the short-term costs in the form of higher energy bills. When not designed well, the combination of clear, concentrated costs and opaque, diffuse benefits can be politically challenging, and result in resistance to carbon pricing. This can happen due to concerns around rising energy prices, carbon leakage and competitiveness, issues that are especially pertinent in the context of the current global cost of living crisis. In parallel to domestic mitigation action, international coordination is key to fostering the global uptake of carbon pricing levels consistent with the Paris Agreement while avoiding carbon leakage.

Experience has shown that the ingredients for overcoming potential barriers include:

- **Inclusive decision-making.** Robust and well-communicated reform processes, clear information on the costs and impacts, credible and staggered time frames, and extensive consultations with all stakeholders about their concerns, the reform's objectives, and expected outcomes.
- **Communicating price increases well in advance.** Long-term, predictable pathways for prices are important for enabling households and firms to adjust in advance.
- **Efficient and equitable recycling of revenue**. Introducing targeted measures for the most affected, especially the poor, in the form of means-tested direct transfers, in-kind transfers (e.g. pro-poor spending on infrastructure), tax subsidies (e.g. earned-income tax credits), a universal dividend (if government capacity is low), or funding for affected sectors and regions. The IDB has estimated that less than 30% of the savings generated by subsidy elimination needs to be redistributed to vulnerable groups to be effective (Vogt-Schilb et al., 2019). Support for a carbon tax often depends on what policies complement it (OECD, 2022e).
- **Making the benefits more visible.** Options include using a price-and-dividend approach by giving the public a green rebate each month from hypothecated tax revenue, albeit earmarking is a contested area.
- **Taking into account political economy factors.** Some sectors may be very sensitive to price increases, others less so. These political economy considerations may strengthen the case for both sector-specific pricing policies and non-price policies (see further below). A forthcoming report by the Partnership for Market Implementation looking into the political economy of carbon pricing will soon provide further guidance on how Ministries of Finance can tackle some of the political challenges around implementing carbon pricing, such as the process of building coalitions, and easing and overcoming opposition, and will emphasize the co-benefits such as for public health.
- **Sequencing.** There is evidence that complementary non-pricing measures such as green industrial and innovation policy can help lay the ground and build support for carbon regulation (Meckling et al., 2015). (Also see Bhattacharya et al., 2021; IMF, 2019a; New Climate Economy, 2018)

Similarly, UNDP (2021b) highlights four factors for successful fossil fuel subsidy reform:

- **Contexts:** develop an understanding of the socioeconomic contexts of communities likely to be affected, including existing levels of subsidy support, the reasons for their existence and the distributional impacts of their withdrawal.
- **Timing:** enact a gradual approach to enable households and businesses to adjust to prices over time.
- **Compensation**: include compensatory measures for the poorest and most affected households, reinforcing existing social welfare benefits.
- **Communication and engagement:** secure buy-in through effective communication and stakeholder engagement, clearly communicating environmental effectiveness and progressive distributional impacts.

The *Carbon Tax Guide* from the Partnership for Market Readiness (2017) provides practical guidance, tools and case studies for each step of the carbon pricing implementation process, including: 1) deciding whether to adopt a carbon tax, 2) preparing for tax adoption, 3) modeling carbon taxes, 4) defining the tax base, 5) determining the tax rate, 6) avoiding unwanted effects of the carbon tax, 7) determining use of revenues, 8) ensuring oversight

and compliance, and 9) evaluating policy outcomes. In addition, the Carbon Pricing Leadership Coalition's resource library and the IMF (e.g. IMF, 2019a; Parry et al., 2021, 2022) have numerous resources available on how to effectively design carbon pricing and taxation measures, drawing on case study examples and good practice experience.

Real world examples[25]

Starting with Finland in 1990, several countries have been able to introduce and maintain a carbon tax, including lower-middle-income countries such as Argentina, Colombia, Chile, Indonesia, Mexico, Singapore, South Africa and Uruguay. Globally, 68 carbon pricing initiatives have been implemented, covering 11.8 gigatonnes of CO_2 equivalent ($GtCO_2e$) and representing 23% of global greenhouse gas emissions (World Bank, 2021a). Many of these examples, including the flagship EU Emissions Trading System (EU ETS), are well documented elsewhere.

- **Canada** is an especially well documented example, where since 2019 carbon pricing has applied in all sub-national jurisdictions, through either a provincial/territorial carbon pricing system, or the federal backstop system. Canada's federal carbon pollution pricing system has two parts: a regulatory charge on fossil fuels (the 'fuel charge') and an output-based pricing system (a regulatory trading system for industrial emitters) (Government of Canada, 2022).
- **Chile's** carbon pricing journey began in 2011, as public concern about climate change was starting to increase. The Environment Ministry developed a set of air quality standards that required electric utilities and heavy industry to develop an MRV system for emissions. This system would eventually provide the foundation for implementing a carbon price. In 2014, Chile's legislature approved a general tax reform that included three emission taxes to be implemented by 2017, including a carbon tax on stationary sources. To accommodate the industry's desire for cost certainty, the carbon tax was fixed in law at $5/tonne and it cannot be increased without the legislature's approval. The tax only applies to emitters above a certain threshold, initially set according to thermal capacity but later amended to total annual emissions. Despite its low price and narrow scope, a key provision—that utilities may not build the tax into the wholesale price of electricity—has made Chile's carbon tax surprisingly effective. Since emitters bear the entire cost burden of the tax, the policy has gradually placed pressure on industry to seek emission reduction solutions. At the same time, many multinational firms operating in Chile have adopted their own renewable energy targets, leading their Chilean subsidiaries to take a more constructive stance on future carbon pricing. In 2022, with the Climate Change Framework Law, the government adopted a mandate to develop an ETS that observers expected to be more ambitious in price and scope than its current carbon tax.[26]
- In **Ireland** carbon pricing represents a key pillar of the overall decarbonization strategy, with Ireland being one of the few countries to have economy-wide pricing through a combination of the EU ETS and a separate domestic carbon tax regime. Introduced in 2003, the EU ETS applies to the power generation and industrial/manufacturing sectors. The domestic carbon tax regime was introduced in 2009 and applies to emissions in the heat and transport sectors, covering fuels such as kerosene, marked gas oil, liquid petroleum gas, fuel oil, natural gas and solid fuels. The current rate is €48.50/tCO_2, applying to diesel and gasoline/petrol, with effect from 12 October 2022 and with a delayed commencement on all other fuels until 1 May 2023. The Finance

[25] It is worth noting that there are differences in views globally between countries, Ministries of Finance, IFIs, NGOs, and key experts on the role that carbon pricing should play in mitigation policy. Differences of view include the role that carbon pricing should play in relation to other complementary measures, its ease of implementation and applicability (especially in low-income countries), and its impact in driving systemic change and innovation. The areas under debate are well summarized by Rosenbloom et al. (2020), and a useful example of the exchange of views between experts includes Lilliestam et al. (2022). Recent meta-reviews of carbon pricing policies around the world include Green (2021) and Carbon Pricing Leadership Alliance (2022).
[26] Case study provided by Michael Learner, LSE.

Act 2020 established a statutory trajectory to increase the carbon tax to €100/t by 2030, which will provide a clear signal and price certainty to drive changes in household and business behavior and investments. Carbon pricing in Ireland is carefully balanced with other policy measures such as regulatory and planning measures, financial sector polices and public investment. Regarding the latter, Ireland has also incorporated a shadow price of carbon into the Public Spending code—the tool the government uses to evaluate the consequences of the capital investment projects. As the government's climate ambitions have been considerably strengthened, the Public Spending Code is to be updated to reflect this enhanced ambition.

- **Denmark** introduced domestic carbon taxation in 1992 and in conjunction with the later introduction of the EU ETS, carbon pricing has played a key role in emission reduction efforts. In 2019, Denmark adopted a new climate law with a target of reducing emissions by 70% in 2030 on 1990 levels. To implement the target, sectoral policy measures have been adopted in energy, industry, transportation and agriculture. A central element of this was a broad political agreement to task an independent expert commission to develop models for a higher and more uniform domestic carbon tax. Complementary measures were introduced as a foundation, including tax deductions for frontloading investment in new hardware and technology that can reduce emissions and targeted support schemes for energy efficiency in industry and carbon capture and storage. Based on the work of the expert commission, the government reached in an agreement June 2022 on a tax reform that will reduce the country's emissions by 4.3 million tCO_2e by 2030, representing the largest single policy contribution to Denmark's 2030 climate target. The agreement introduces a higher and more uniform carbon tax that will be phased in from 2025 and reach around €100/t for companies outside the EU ETS and €50/t for those within it by 2030. To reduce the risk of carbon leakage, targeted support for the green transition will be given to companies most affected by the tax. A floor price will be implemented if the EU's carbon market does not perform as expected. The Danish expert commission on green tax reform has also been tasked to develop models for greenhouse gas taxation in agriculture, emissions from which by 2030 are expected to account for around half of Denmark's total emissions. (See also The Danish Government, 2021).
- In **Sweden**, a carbon tax was instituted, alongside an already existing energy tax, as part of a major tax reform in 1991. By increasing the tax level gradually and in a stepwise manner, households and businesses have been given time to adapt, which has improved the political feasibility of tax increases. The carbon tax remains a cornerstone of Swedish climate policy together with the EU ETS.

Starting with Finland in 1990, several countries have been able to introduce and maintain a carbon tax, including lower-middle-income countries such as Argentina, Colombia, Chile, Indonesia, Mexico, Singapore, South Africa and Uruguay. Globally, 68 carbon pricing initiatives have been implemented, representing 23% of emissions.

Many countries have existing energy and fuel taxes that can also amount to substantive (implicit) carbon prices for particular fuels (IMF, 2019a).[27] In addition, many countries have been able to introduce and sustain fossil fuel subsidy reforms, although progress may prove challenging in the short term given the current energy crisis. For example:

- **Indonesia** raised gasoline and diesel prices by 33% in 2013 and another 34% in 2014, saving Rp211 trillion ($15.6 billion), equal to 10.6% of all government expenditure, which was reallocated to major investments in social welfare and infrastructure (Government of Indonesia, 2019).
- **India** eliminated diesel subsidies in October 2014, removed price controls on gasoline, and launched a successful campaign to get wealthier consumers to give up subsidized liquefied petroleum gas (NCE, 2014).
- Many others have been able to implement a sustainable and effective energy subsidy reform (for example, Chile, Mexico, Ecuador, Brazil, Turkey and Namibia) (e.g. see New Climate Economy, 2018).

ii) Creating fiscal incentives and regulations for transforming key sectors

Context and role of Ministries of Finance

Carbon pricing and subsidy reform often need to be supplemented with other fiscal incentives and regulatory measures to overcome market- and non-market barriers to transforming key economic systems and sectors of the economy (see Box B3 and Part A for investment priorities). In transportation this includes the need to tackle network externalities around EV charging infrastructure; in buildings this includes tackling split incentives where investment returns from retrofits can accrue to another party; and in energy efficiency this includes information costs and gaps in new technologies. Often, long-term market signals are needed to provide a stable environment for private investors.[28]

Growth in new sectors of the economy often require support to accelerate them through the typical 'S' curve, impacting new technologies or business models. This S curve has three phases: (i) early adoption where the new technology is not widely available; (ii) a period of rapid growth or take-off; and (iii) consolidation as a technology matures. In the early adoption phase, there are typically a wide range of interlocking market failures that lead to an undersupply of private investment. This usually requires Ministries of Finance to consider fiscal incentives and greater regulatory certainty to reduce the costs compared with the current market regime. In the rapid growth and consolidation phases, public support can be phased out. Germany and China are good examples of the public sector providing strong incentives for solar photovoltaic in the early stages of growth (Altenburg and Assmann, 2017). If designed well in tandem with other policies, such incentives can help to make carbon pricing schemes more effective and efficient at supporting the transition (Hepburn, Stern et al., 2020).

The fiscal incentives to tackle market failures and other barriers to investment that can be considered by Ministries of Finance and relevant line ministries include, *inter alia:*

- **Direct tax incentives** to consumers or manufactures, such as a one-time bonus or rebate (e.g. for purchasing an EV or a more efficient boiler); tax deductions or credits (e.g. reduction of VAT for use of on-site renewable energy); reductions in import taxes (e.g. for EVs); lower taxation on fuel (e.g. lower taxation of electricity versus fuels); or accelerated depreciation to defer tax liability (e.g. on renewable energy).
- **Loan programs, guarantees and credit enhancements** to provide subsidized/lower interest loans and/or reduce risk associated with loans (e.g. for on-site renewable energy). This can be done through green infrastructure or development banks, or programs specifically designed for this purpose.

[27] For example, averaged globally, road fuel taxes of around $1/liter represent a price of $380/t$CO_2$ from these fuels (IMF, 2019a).

[28] This is because businesses may not innovate rapidly enough and consumers change their behaviors due to changes at the margin in the price of energy without the simultaneous emergence of strong and attractive low-carbon alternatives. For example, while the rapid deployment of chargers is necessary for the rollout of EVs, charger expansion will not initially reduce emissions—but it marks a vital step in the transition, because it is part of the necessary systemic change.

- **Grants and performance-based incentives** to provide a direct cash incentive that do not require repayment (e.g. for retrofitting buildings).
- **Indirect or non-monetary incentives** (e.g. exclusive access to parking spaces or lanes for EVs or e-buses).

Most countries have used one or more of these fiscal incentives. Each one has pros and cons based on their ease of distribution/collection, linkage with externalities and other market failures, and level of social progressivity. Ministries of Finance will also need to balance new fiscal policy measures against creating undue complexity in the tax system. There is some literature on the effectiveness of each type of incentive. For example, Diaz Anadon et al. (2021) provide an overview of the outcomes and trade-offs of 10 types of decarbonization instruments.

Ministries of Finance can also work with relevant line ministries to consider regulatory standards such as phasing in net zero national building codes or ending the sale of internal combustion engine vehicles. This helps to provide a long-term market signal to the private sector of the intention to create a new market. The historical evidence is that regulatory limits have been highly effective at curtailing environmental pollutants and setting a powerful signal for private sector behavior and spurring innovation (Stern, 2022).

Barriers to action and ways to overcome them

A wide range of barriers typically have to be overcome to design effective fiscal incentives. They include the fear of unsustainable, unending fiscal commitments to a sector and the ineffective matching of incentives to overcoming the barriers in question. Ministries of Finance will need to work with relevant line ministries to put in place the basic ingredients for success.

Lessons for successful schemes include the need to:

- **Base incentive design on robust economic, financial and market analysis.** Incentives need to be (i) specific to certain technology sizes, costs and performance measures; and (ii) complementary to investments such as in network infrastructure.
- **Establish an appropriate incentive timeframe to support sustained investment.** Market certainty over a five to 10-year period will be critical to achieving successful outcomes. Reductions in incentive levels over the period of the program should be considered as the market develops and uptake of the technology increases, until cost parity with alternatives is reached.
- **Engage the private sector and finance community to leverage diverse pools of capital.** To avoid crowding out private investment, financial incentives should address gaps and barriers associated with private investment. Strong public–private partnerships can support a multiplier effect for public funds invested in renewable energy and energy efficiency.
- **Help line ministries introduce complementary regulations.** Strong regulatory standards provide a critical foundation for the success of financial incentives, as outlined above.
- **Closely coordinate incentive programs or bundle incentives.** Many countries and jurisdictions offer diverse portfolios of incentives targeted at various markets and technologies. Incentive programs can be closely coordinated or 'bundled' to improve overall program efficiency.
- **Expand outreach to support market development.** In many cases there is a need to build market awareness of the benefits of technologies and the specific financial incentives offered.
- **Monitor and evaluate benefits and costs and improve financial incentives over time.**
- **Consider inclusion of non-taxable entities** in tax incentives to engage low-income individuals. (See Bonzi Teixeira et al., 2022; CESC, 2016)

Real world examples

- **Uruguay** has become one of the only countries to rely on renewable energy for almost all electricity generation and it has close to 60% renewable energy in the total energy mix (Ministry of Industry Energy and Mining, 2021). It is an example that demonstrates how Ministries of Finance can play a powerful leadership role in driving sector transformations using a combination of fiscal incentives. The high level of renewables has delivered a wide range of economic, social and environmental benefits and has contributed to energy security and macro stability in the face of today's global energy price spikes (see Box B4 for further detail).
- In the **UK**, targeted subsidies cut the cost of offshore wind by around 70% in a decade, making it a cheaper source of electricity than gas (Evans, 2022).

Other examples are more nascent and the results are as yet unclear:

- In **Germany**, to address the high cost of investments in green building renovations, the Ministry of Finance announced new tax incentives for energy-efficient building retrofitting as part of the Climate Action Program 2030 (BMWK, 2019). The new law, which came into effect in 2020, established tax breaks for individual owners to invest in energy-efficient renovations and install renewable energy heating systems. The fiscal incentives help to reduce renovation costs by up to 20% and these projects have the potential to save up to 3.4 million tCO_2 by 2030 (IEA, 2021a).
- In **Ethiopia** the Ministry of Finance introduced a new tax reform in September 2022 that encourages EV investment and imports plus local vehicle assembly (Bloomberg Tax, 2022). Under the new law, VAT, excise and surtaxes will not be applied to EVs. Moreover, the duty tariff for EVs will be reduced to 15% while those vehicles that are assembled locally will be exempt from customs duties. The new reform aims to make EVs more affordable to local citizens and create incentives to grow the local EV assembly sector.
- In **Iceland** exemptions on excise duty on EVs gave a sizeable VAT rebate, which has led to an increase in EV uptake. This places the country as one of the three leaders in EV shares globally. In 2022 the government proposed applying a minimum tax on all cars, including EVs, and the introduction of new road tolls (Iceland Review, 2022).
- **Belgium** approved a law at the end of 2021 to abolish the tax advantage for internal combustion engine company cars, in a move designed to accelerate the transition of the vehicle fleet. From 2026 onwards, only zero-emission company cars will benefit from a tax advantage.

Uruguay has become one of the only countries to rely on renewable energy for almost all electricity generation, which has delivered a wide range of economic, social and environmental benefits. It is an example that demonstrates how Ministries of Finance can play a powerful leadership role in driving sector transformations using a combination of fiscal incentives.

Box B4. Uruguay: renewable energy transformation, energy security and protecting against inflation

Between 2017 and 2021, nearly 95% of Uruguay's electricity generation originated from renewable sources. This is a significant change from just over 10 years earlier, in 2008, when the share of oil in Uruguay's power generation reached 38.7% and renewables accounted for 61.3%. Renewable energy investment exceeded $8 billion in the last decade. While hydropower has long been a keystone of Uruguay's electricity mix, generation from other renewable sources, especially wind, solar and bioenergy, has increased rapidly. The incorporation of these further renewable energy sources reduces climate vulnerability and cost overruns in dry years in which there is low availability of hydroelectric power, while reducing emissions. This strategic approach has bolstered the country's balance of payments and placed it in a strong position to fare better from current energy price inflation in global markets.

Auctions are the main instrument for promoting renewable electricity in Uruguay, whereby the government-owned national electric company (UTE) awards power purchase agreements (PPAs) to successful bidders.

- **Wind.** From no large-scale wind energy in Uruguay before 2008, the country now has an installed capacity of 1,506 MW.
- **Solar.** The use of solar energy conversion technology has undergone significant development. There are 19 large-scale photovoltaic plants, with a total capacity of around 229 MW.
- **Bioenergy plants.** The development of energy production from non-traditional biomass occurred in parallel to the growth of forestry, pulp and agricultural production industries, and existing bioenergy plants in the country represent 9% of all installed energy capacity (425 MW).

The rapid expansion of renewables in Uruguay can be attributed to:

1. **Long-term policy.** The National Energy Policy 2005–2030 was approved in 2000. An important feature of the policy is its commitment to the diversification of Uruguay's energy sources with a focus on renewables. This established a solid institutional and regulatory framework that proved attractive to investors. It had multiple goals: energy independence, mainly to delink the national budget from the variations in the international price of oil, promote the national energy industry and mitigate greenhouse gas emissions.
2. **Fiscal incentives and investment promotion.** Significant fiscal incentives for renewables are encompassed in the Investment Promotion Law No. 16906. Foreign and national investments are treated equally under the law and enjoy tax benefits on corporate income and equity (e.g. 30–100% of the amount invested is considered part of their tax payment). This creates a favorable investment environment. Decree 354/009 grants specific tax incentives for the renewable energy sector based on Article 11 of the Law for the Promotion and Protection of Investment, such as treating wind power generation projects destined for the national system as intangible assets. The Solar Thermal Energy Promotion Law provides tax exemption for research, manufacturing, development and training in solar thermal energy (including for non-competing imports).
3. **Partnerships.** Strong partnership between the public and private sector have been achieved through the auction mechanism for renewable electricity. This instrument guarantees stable demand and prices, with contracts lasting for up to 20 years.

This proactive approach is now paying off: Uruguay is now seeing lower inflation rates than any other Latin American countries: in September 2022 the median increase over 2021 in the annual inflation rate was 1.5% in Uruguay, compared with 5% for the main economies of Latin America (MoF Uruguay, 2022).

Source: Prepared by the Uruguay Ministry of Finance based on Uruguay XXI

iii) Combining instruments into smart policy packages to drive transformation[29]

Ministries of Finance will need to find ways to bring the full suite of possible macro and fiscal policy measures outlined above into coherent smart policy packages (Petrie, 2021). This involves taking advantage of the strong interactions between instruments to develop climate policy packages with reinforcing incentives instead of measures that work against one another or make each other redundant. Regulations to mandate the use of low-carbon technologies or set an end date on the sale of fossil-fuel driven vehicles could enhance the effectiveness of a carbon tax or reduce the tax rate needed to achieve a given mitigation goal, for example. An ETS in the continued presence of fossil fuel subsidies could risk nullifying the impacts of the scheme. And fiscal incentives to encourage use of a low-carbon technology that is mandated by effective regulation may result in subsidies being paid where the technology would be adopted in any case.

The greater the number of policies in a policy package, the more difficult it is to maintain policy coherence. Complexity in the tax system is also an issue that should be weighed against the benefits that can be potentially derived from the implementation of a policy. For example, a complex policy mix may be good on paper, but ineffective if the country does not invest in the human resources or technological capacity to oversee effective implementation or enforcement of such measures. Greater attention is due toward sectors that exhibit numerous market and government failures, such as transportation, where an optimal policy mix is likely to include the use of many different instruments. There should be an effort by Ministries of Finance to match these instruments with the desired externalities.

Real world examples

While there is relatively little guidance on effective institutional arrangements for climate policy packages, there are some emerging examples of powerful Ministry of Finance leadership in doing so:

- **Chile's** Green Finance Strategy for Climate Change sets out a clear framework that contains macroeconomic and fiscal policies, public financial management, and financial regulation, along with work required with other stakeholders, such as sector ministries, the central bank and supervisors (IDB, 2021).
- **Costa Rica** is an example of how to link different environmental taxes to fund forest conservation. The National Fund for Forest Finance (FONAFIFO) pays private landowners for conservation and restoration activities with funding from a fossil fuel and a water tax, and has contributed to forest cover increasing from a low of 21% in 1987 to 52% in 2018 (World Bank, 2020). Restoration brought back biodiversity and ecosystem services that have become the basis of a vibrant eco-tourism sector that contributes an estimated 5% of GDP and is a leading source of hard currency.
- The **EU's** Fit for 55 package can be considered a smart policy package. The proposals aim to revise and update EU legislation and to put in place new initiatives to achieve the EU's objective of a 55% reduction in net emissions by 2030 and carbon neutrality by 2050. The package consists of a range of levers, including:
  - Strengthening and extending the EU ETS and the creation of a carbon border adjustment mechanism (CBAM)
  - Reinforced emission reduction targets for each Member State
  - More ambitious sectoral regulations and standards, such as a phase-out date of 2035 for internal combustion engine vehicles
  - Mobilization of European financial resources for decarbonization and a just transition, including through a social climate fund.

Box B5 provides further country examples of climate policy packages, although the focus in the literature is on the policies rather than on the institutional arrangements for policy advice.

[29] This section is based on a contribution from Murray Petrie (Expert Advisory Group).

Box B5. Examples of countries with smart policy packages

The **German** government's approach to increasing energy efficiency in buildings has involved regulation (with the incremental introduction of increasingly demanding standards providing signals and time to adjust); financial incentives to comply with regulations (subsidized loans by promotional banks such as KfW with the subsidy varying by the degree of energy efficiency); and information-based programs, such as mandatory energy performance certificates for buildings. The elements are designed to complement and mutually strengthen each other and are linked to renewable energy targets and the promotion of jobs and expertise related to energy efficiency to form a coherent energy policy package (Never and Kemp, 2017).

In **India** the development of solar power formed part of the 2008 National Action Plan on Climate Change. The strategy included a long-term vision and phased targets; preferential feed-in tariffs; renewable energy purchase obligations and certificates; tax incentives; R&D subsidies; preferential loan schemes; and local content requirements to support the build-up of national manufacturing capabilities. State-level incentive programs complemented the federal legislation (ibid.).

In the **UK** greenhouse gas emissions fell by 44% from 1990 to 2019 mainly due to lower emissions from power generation, reflecting the transition from coal to gas in the 1990s, then near-total replacement of remaining coal with renewables (UK Office for Budget Responsibility, 2021). A different mix of policies has been used in different sectors:

- Tax and regulatory interventions that raised the cost of coal prohibitively (notably the introduction of the carbon price floor, a carbon tax that overlays the ETS so that power stations pay a minimum price per tonne of CO_2).
- Policies that cut the price of renewables (especially wind power), including feed-in tariffs that subsidize small-scale generation through production subsidies financed by tax-like costs added to consumers' electricity bills, and 'contracts for difference' implemented by the Department for Business, Energy & Industrial Strategy (which incentivized larger-scale generation by guaranteeing producers a fixed price, with any costs or savings passed to consumers).
- Standards and regulations: e.g. a ban on the sale of new petrol and diesel cars from 2030; energy efficiency standards for government buildings.
- R&D subsidies for green energy.

Countries have also pursued 'green industrial strategies' as part of wider efforts to promote a new economic growth path while mitigating climate change. These strategies contain policy packages. Examples include:

- **Morocco:** Policies simultaneously reduced support for non-sustainable technologies (coal-fired electricity) and increased incentives and subsidies for renewable electricity generation (Altenburg and Assmann, 2017) while attracting foreign direct investment and building domestic industry capacity. Fossil fuel subsidies were eliminated from 2013, accompanied by targeted subsidies and a public communications initiative.
- **China:** The Climate Change Strategy included changes to VAT rebates for exports and to customs duties to disadvantage polluting firms and sectors, the closure of many smaller inefficient polluting enterprises, a target to increase the proportion of renewable energy, and support at national and local levels to domestic manufacturing in solar and wind (Never and Kemp, 2017).
- **Ontario, Canada:** The policy mix included phasing out coal-fired electricity generation, a target for renewable energy, feed-in tariffs for renewable power, and a PPP contract committing renewable electricity purchases at guaranteed preferential prices (ibid.).

Source: Prepared by Murray Petrie (Expert Advisory Group)

Opportunities for action

Ministries of Finance should work with relevant line ministries to design ambitious carbon pricing schemes and subsidy reforms in line with the Paris Agreement that are socially just, politically acceptable and inclusive. There are already well-established guides, principles and case studies that can inform the design of effective schemes, including through the Helsinki Principle 3 workstream.

Alongside explicit carbon pricing, Ministries of Finance can consider other ways to price other environmental 'goods' or 'bads'. Ministries of Finance can consider:

- Reforming harmful agricultural subsidies to reflect the social cost of food production.
- Introducing payments for protection of ecosystem services and forests.
- Introducing water permits or pricing to help preserve reservoirs and aquifers that are being depleted.
- Taxing plastic bag use.
- Putting a price on methane, through fees or revenue-neutral 'feebates.'

Ministries of Finance should supplement carbon pricing, subsidy reforms and other forms of environmental taxation with other fiscal incentives and regulations in nationally significant sectors to drive climate action, including energy, transportation and buildings. Ministries of Finance should:

- Carefully consider relevant fiscal incentive instruments based on their ease of distribution and collection, linkages with externalities and other market failures, and social progressivity.
- Consider an appropriate incentive timeframe to support sustained investment that can be phased out over time, tracking the benefits and costs to inform course corrections.
- Work with line ministries to consider complementary regulatory standards such as an end date for the sale of internal combustion engine vehicles.

Ministries of Finance should look to combine a range of these pricing and non-pricing instruments in coherent smart policy packages. This can help to address multiple market and non-market failures concurrently and enable them to capitalize on the strong interactions between fiscal instruments while avoiding contradictions that can undermine collective impact.

Function 2b. Future-proofing the public finances by redesigning the tax system for net zero and climate resilience

In this subsection we address:

i. Identifying alternative revenue streams to taxing fossil fuels
ii. Managing the fiscal risks of cascading contingent liabilities

i) Identifying alternative revenue streams to taxing fossil fuel[30]

Context and role of Ministries of Finance

Ministries of Finance will need to identify new sources of tax revenue as the transition to the net zero economy proceeds, to avoid significant impacts on tax revenues in the medium to long run. For many economies, the transition toward a net zero economy and electrification is already having a big impact on tax revenues and is likely to continue to do so, and Ministries of Finance need to be prepared to identify alternative sources (IMF/OECD, 2021). Dependence on fossil fuel revenues creates significant political economy barriers to the transition.

Tax revenues could be impacted, especially in the medium to long run, through two main direct channels:

- **Production:** The impacts of declining tax revenue from fossil-fuel production as the real economy shifts away from fossil fuels and toward low carbon-alternatives. This will be particularly acute for resource-rich economies that collect revenue in the form of taxes, fees and royalties on extractive industry profits, sales and export revenues in contractual or concession-based schemes.
- **Consumption:** The impacts of declining tax revenue from taxation of fossil fuel consumption as energy efficiency increases and electrification ramps up. This is particularly pertinent to tax revenues from road transportation (given that most fossil fuel energy uses are either untaxed or taxed at low rates). Common forms include fuel duty, vehicle excise duty and air passenger duty.

In some countries, tax revenues from fossil-fuel production can account for over 50% of government revenues (GGSD, 2019). They often help to capitalize sovereign wealth funds (SWFs).[31] In many other countries, fossil fuels still contribute substantially to tax revenues. The US generates $138 billion annually from fossil fuels, for example (Raimi et al., 2022). Tax revenues on fossil fuel consumption can account for up to 15% of government revenues albeit large importers of fossil fuels are often vulnerable to balance of payment issues (GGSD, 2019). In many countries this tax base is already eroding due to improved energy efficiency in the transportation sector. This is likely to be exacerbated as certain forms of revenue trend toward zero as the electrification transition progresses, and as fiscal incentives are introduced to help consumers cover the higher (albeit rapidly declining) upfront acquisition costs of EVs (Bonzi Teixeira et al., 2022).

Ministries of Finance should be cognizant that new forms of carbon pricing cannot form a permanent part of the tax base as receipts gradually decline as carbon is squeezed out of the system. This has already been evident in countries such as Norway and Sweden over the last 20 years (GGSD, 2019). Carbon taxes can instead act as a strong interim solution to financing the transition. However, this issue is likely to be less of an immediate issue for countries at the early stages of introducing new forms of carbon pricing.

It is nevertheless important that Ministries of Finance urgently take steps now to develop holistic tax reform strategies to identify new sources of revenue. Tax systems need to be redesigned, striking a balance between three objectives:

- Delivering national climate objectives
- Maintaining sufficient revenue stability to sustain public spending (including for tax incentives to encourage green and resilient investment)
- Future-proofing tax systems with new revenue sources.

[30] The issue of broadening the tax base to finance investment in sustainable infrastructure, including through tax reform, increased tax collection and compliance, is discussed in Function 3a.

[31] Many countries are beginning to use SWFs as vehicles through which to invest oil wealth into the green economy and help advance the green transition (see also Function 3b).

Barriers to action and ways to overcome them

Ministries of Finance in countries strongly reliant on fossil-fuel extraction face major barriers to diversifying tax revenue streams. These often include:

- Citizens' expectations of immediate wealth, generating added pressures on governments to spend rather than invest revenues.
- Resource export revenues impacting the competitiveness of the non-resource export sectors through the potential impacts on currency appreciation (so-called 'Dutch disease' effects).
- Strong vested interests as political groups, ministries or regional authorities compete for a share of revenues.
- High levels of government recurrent expenditure, weak institutions and a weak investment environment due to dependency on extractive rents.

There are strategies that countries can use to diversify revenue sources while enhancing energy security, although this requires leadership and can be challenging. Some countries may be able to become significant exporters of low-carbon energy and replace fossil fuels as a source of export and fiscal revenue. Although contentious, in the near-term large exporters of fossil fuels may be able to use national savings to capture resource wealth for investing in alternative economic pathways to the extractive production and consumption of fossil fuels. Significant importers of fossil fuels may be well placed to generate their own domestic low-carbon energy, which can become an emerging source of tax revenue over time and concurrently reduce pressure on the balance of payments (GGSD, 2019).

With the right investment, clean, secure and affordable energy may soon open up options for alternative revenue streams. For example, as net employment from the clean energy transition increases (Pai et al., 2021), personal and corporate income taxes from industries such as wind and solar are likely to provide a viable alternative to similar taxation within the fossil fuel space (Raimi et al., 2022). Clean energy technologies such as commercial wind generation facilities present a new potential revenue stream for local governments that rely on fossil fuel property taxes, albeit one challenge with such taxation is that regions that rely heavily on fossil fuel revenues are not typically the ones where clean energy technologies are deployed. In Montana, US, local governments received $9.4 million in property taxes from commercial wind production projects in 2019 (ibid.).

Equally, Ministries of Finance in countries strongly reliant on taxation of fossil fuel consumption have a menu of options to mitigate the impact stemming from the reduction in fuel taxes. These can be considered once the electrification transition takes a firm hold and include:

- Phasing in well-designed motoring taxes based on distance according to place, time of driving, and type of vehicle to tackle the externalities of congestion, accidents and road damage, plus taxes on use and purchasing of vehicles (e.g. acquisition, registration, excise/import taxes)
- Enhancing road pricing
- Use of feebates (where carbon pricing is politically challenging)
- Adjusting electricity tariffs applicable specifically to EVs
- Taxes on land and property including development fees and charges, property tax reform, reforms to stamp duty on property sales, and betterment levies (which can encourage more compact, connected, clean development at the same time)
- Use of other forms of environmental taxation (as above)
- Reforming general forms of taxation (income tax and VAT)
- Identifying new revenue sources (financial transactions, wealth, digital services)

(See IMF/OECD, 2021; Coalition of Finance Ministers for Climate Action, 2022d; Floater et al., 2017a; Kapeller et al., 2021)

Each instrument has pros and cons in terms of ease of collection, revenue limitations, link with addressing externalities, and social progressivity.

Real world examples

Some far-sighted countries are looking at ways to diversify their economies, energy system, and tax base away from fossil fuel production and consumption. For example:

- In **Costa Rica** 95–98% of electricity comes from renewable energy sources, mostly hydroelectric and wind power. Costa Rica collects energy-related taxes, including taxes on fuel and petroleum products and a public lighting charge on electricity consumption (OECD, 2019), while it provides tax exemptions for renewable energy sources. It recently published its LTS, the Nationwide Decarbonization Plan for 2050, which includes green tax reform led by the Ministry of Finance and which emphasizes moving away from the state's gasoline sales revenue from its state-owned oil refinery. As a starting point, the Ministry of Finance recently introduced a system to categorize tax expenditures according to their impact on the environment to align the fiscal strategy with its environmental goals.
- In **Uruguay** 94% of electricity generation in 2020 came from renewable sources, and 58% of energy used was renewable, which is a rapid increase from 61% and 44% respectively in 2008 (see Box B4).
- In **Nicaragua**, only 25% of electricity was generated from renewable sources in 2007, but as of 2020 the annual average had increased to 69.8% (IAEA, 2021).
- **Morocco** has expanded its investments into solar energy in recent years and the share of renewable sources in electricity generation increased from 8.7% in 2012 to 37% at the end of 2020 (Alami, 2021).
- The share of energy from renewable sources increased from 58% to 77% in **Norway** and from 38% to 60% in **Sweden** between 2004 and 2020 (Eurostat, 2022).

While there is limited evidence yet available on the impacts on fiscal positions, these examples do seem to suggest that this can be done without significant erosion of aggregate revenue bases. More detailed research is needed in this regard, however.

There are also emerging examples of Ministries of Finance assessing the potential fiscal consequences of electrifying transportation (Bonzi Teixeira et al., 2022). New forms of taxation based on 'distance' to create a connection between the mileage driven and the amount of money paid are being considered by many countries. Other systems use an 'access charge' approach to charge for access to roads using vignettes (time-based user charges) or congestion charging instruments. These can help to sustain revenue from transportation-related taxes while facilitating the long-term transition to zero-emission mobility (IEA, 2019). Examples include:

- The Swiss **road user charging** (RUC) scheme, which charges trucks for the distance driven, utilizing the European global navigation satellite system (GGSD, 2019). A complementary system uses a 'vignette' fee-based instrument in which all major national highways and motorways require motor vehicles under 3.5 tonnes to have a vignette, which costs 40 CHF.
- Systems of **RUC and Mileage Based User Fees (MBUF)** being piloted in the US by the Eastern Transportation Coalition as possible substitutes for the fuel tax to make up for lost tax revenue (Eastern Transportation Coalition, 2022a).
- **Congestion charging mechanisms** such as the Central London congestion charge, Manhattan congestion surcharge in New York City and congestion tax in Stockholm. These systems can provide stable revenue streams, be designed to be less regressive for vehicles that are older and can enable EVs to contribute to investments into better road infrastructure (Eastern Transportation Coalition, 2022b).
- **Registration fees** for vehicles, such as in California, which introduced vehicle registration fees in 2020 to address decreases in gasoline/petrol tax revenue, charging zero-emission vehicles a fee of up to $275 and earmarking revenue for road infrastructure investments. Care is needed to avoid impacting EV sales in the

early stages of uptake. Sweden introduced a system of vehicle taxation in 2006 that taxes cars based on their CO_2 emissions. In addition, from 2018–2022 a purchase bonus for low-emitting vehicles (including EVs) incentivized the sale of such vehicles. This has had some positive impacts in terms of sales of EVs and value of used cars (ibid.).

ii) Managing the fiscal risks of cascading contingent liabilities

Context and role of Ministries of Finance

Physical climate and transition risks are likely to become ever more significant as macroeconomic impacts trigger contingent liabilities, with known and unknown costs for the public purse. These might include legal claims after climate-related events, financial sector bailouts, the need to abruptly shut down or rescue failing fossil-fuel extractive sectors, or relief expenditure and structural development funding to support impacted regions.

Climate risks related to acute events and natural hazards such as cyclones and extreme heat events, or slower onset chronic risks are driven through two main channels:

- The **direct impact** on households, businesses, financial sector and government
- The **cascading macroeconomic impacts** as the direct impacts ripple through the system, potentially triggering contingent liabilities with known and unknown costs.

These risks are transmitted in five main ways:

- Households face significant health impacts, income loss, and property damage.
- Businesses face revenue loss due to business disruption and property damage.
- The private financial sector is impacted through real economy impacts and sudden asset revaluations, potentially impacting financial stability.
- The government in general, and the Ministry of Finance in particular, is directly affected via lower revenue streams, higher expenditures, and potentially higher borrowing costs.
- The wider impacts on macroeconomic conditions through a decrease in the lifespan of infrastructure, impacts on labor productivity, sudden shifts in consumption patterns, inflationary pressures, impacts on tourism and agriculture, and debt sustainability. (Coalition of Finance Ministers for Climate Action, 2021c)

Concrete exposure to climate-related risks is country- and context-dependent due to geographical and structural differences. In general, climate impacts are more severe for disadvantaged people and communities across countries of all levels of development.

The interaction of these risks can lead to reinforcing feedback effects, potentially triggering contingent liabilities for Ministries of Finance. Contingent liabilities are obligations that only materialize when a certain event occurs in the future. Such risks could become gradually or abruptly more severe with ongoing climate change. For instance, the materialization of climate physical risk could lead to a higher probability of loan default by firms, requiring the financial sector to tighten lending conditions. The prevention of access to funding or higher costs of finance for adaptation and recovery investment could drive reinforcing feedback effects, and further enhance climate risk.

Contingent liabilities can be explicit or implicit, known or unknown, and constitute substantial fiscal costs for the government if they materialize. They include physical climate risk but also transition risks. Examples include, *inter alia*:

- Legal claims and judicial awards from companies and households after climate-related events or related to the transition (see Box B7)
- Financial sector claims: a banking crisis can lead to the need for bailouts and financial sector guarantees, causing sovereign debt distress

- Disaster-related contingent liabilities related to replacement of infrastructure
- Default on loans from on-lending activities to companies and households
- The need to abruptly shut down or rescue failing fossil fuel extractive sectors
- The need to alter guarantees to SOEs or minimum revenue guarantees to PPPs
- The need for relief expenditures and to develop structural development funding to support impacted regions
- The need for additional social security spending to protect impacted workers.

Reinforcing feedback effects from climate physical and climate transition risks might increase the scope and likelihood of the occurrence of contingent liabilities with unknown fiscal costs for Ministries of Finance.

The materialization of contingent liability risks could reduce the fiscal space of Ministries of Finance, potentially requiring budget cuts in critical sectors (e.g. healthcare, education), necessitating tax increases or leading to higher public debt levels. This could raise concerns related to debt sustainability, potentially causing a deterioration in sovereign creditworthiness. Firms, banks and investors might default; households could fall into long-term unemployment and poverty. As such, climate-related risks could impact countries' long-run economic growth paths.

Fortunately, strong action by Ministries of Finance can help to address some of these risks through mitigating emissions and investing in adaptation (limiting climate physical risk), and policies to drive a smooth economic transition (limiting climate transition risk). Moreover, macroeconomic modeling and analysis of climate physical risk (including compounding events such as pandemics) can highlight the potential implications for tax revenues. Such analysis can help countries prepare for the new climate-related elements of IMF Article 4 consultations, to reflect climate in their budgetary processes, and to enhance their financial resilience to climate change. Function 3d covers more specific measures targeted at providing disaster risk financing and insurance for all.

Box B6. Stranded fossil fuel assets, contingent liabilities and risks to the tax base

Stranded assets include fossil fuel-based power plants; oil, gas and coal fields that will remain unused due to the energy transition; and related infrastructure for electricity transmission, exploitation and transportation; and oil, gas and coal processing. In addition to risks to financial stability (see Function 3b), a key risk from stranded assets is the fall in public revenues from extractive sector activities (such as royalties) and gasoline taxes. For example, if the Paris Agreement targets are met, between 66% and 81% of Latin America and the Caribbean's oil reserves would have to remain unexploited by 2035 and tax revenues would decrease by between $1.3 and 2.6 billion (Solano-Rodriguez et al., 2019). Under the same assumption, for natural gas, 70% of the region's proven, probable and possible reserves could not be exploited, which would imply that cumulative tax revenues from natural gas in the period from 2017 to 2035 would be less than a quarter of what would otherwise be expected (Welsby et al., 2021).

Delaying the implementation of decarbonization actions may increase the cost of stranded assets in the future, as investments in fossil fuel power plants, oil and gas infrastructure and refineries continue. Some countries are already taking proactive steps. Chile, for example, has designed a plan for the early closure of coal-fired power plants (before the end of their useful life) in line with the country's long-term goal of decarbonization and interest in potential electricity generation with renewable sources. The first closure took place in 2022.

Source: Adapted from Eguino and Delgado (2023)

Barriers to action and ways to overcome them

Identifying and addressing the macroeconomic and fiscal impacts of physical and transition risks is not easy. The challenges are many and cannot be covered in detail here. One of the most pertinent barriers is that many Ministries of Finance lack the capability either to identify or to craft strategies to tackle these risks. They can start by working with other relevant line ministries to improve the surveillance of climate-related risks, to set up national mechanisms for quick financial responses to disasters, and to enhance climate legal expertise. Working with central banks to understand sources of vulnerability for the macroeconomy and the financial system is another important priority.

Real world examples

The Bahamas is a good example of a country crafting responses to the cascading direct and indirect impacts of physical climate risk on its fiscal position. The Bahamas is already seeing the impacts of more frequent and severe climate-related shocks on its GDP (Zegarra et al., 2021). This is having secondary impacts on debt and insurance premiums, which significantly impacts investment attractiveness, the concessionality of lending, and accessibility of ODA for the Bahamas. In turn this reduces the country's fiscal room to respond to future events, creating a vicious circle of reduced fiscal room, hits to GDP and growing debt. The Ministry of Finance and Office of the Prime Minister (OPM) are working closely together to address the impact of these known and unknown contingent liabilities on the government. For example, they are working to identify opportunities for investments in climate-resilient infrastructure and the blue economy (including in sectors such as seagrass), driven by a new climate unit in the OPM with a strong partnership with the Ministry of Finance. They are exploring the introduction of a Climate Change and Carbon Market Act to earn credits for reinvestment in the new economy. And they are exploring debt for climate swaps, collaborating with scientists, the private sector and young people to develop a positive vision for the future.

Disaster risk clauses are another way for Ministries of Finance to reduce the risks of climate risks on their fiscal position. Barbados introduced such a clause into loan agreements, meaning that in the case of a natural disaster it will be able to make up to $700 million—almost 15% of its economy—available for debt service payments to spend on emergency response, rebuilding and recovery (Ho and Fontana, 2021).

The materialization of contingent liability risks could reduce the fiscal space of Ministries of Finance, potentially requiring budget cuts in critical sectors such as healthcare and education, necessitating tax increases or leading to higher public debt levels.

Box B7. Implications of climate litigation for Ministries of Finance

There are now more than 2,000 documented cases of climate change litigation, filed in more than 40 countries (Setzer and Higham, 2022). Although the success of such efforts varies, the IPCC has now recognized that climate cases can have a significant impact on the "outcomes and ambition" of climate governance (IPCC, 2022). Cases against governments may argue that government decision-making is inconsistent with existing climate change legislation. Alternatively, they may rely on existing legal norms such as human or constitutional rights obligations to argue that governments have a duty to take action to protect citizens from climate impacts. Recent years have also seen an increased focus on cases involving financial market actors, particularly considering Article(1)(c) of the Paris Agreement which requires states to work toward aligning financial flows with low-carbon and resilient development (Setzer et al., 2021).

Although Ministries of Finance have rarely been the direct target of climate change lawsuits to date, **climate litigation may impact them directly or indirectly in several ways:**

- Ministries of Finance may find their own policies and decisions subject to challenge through the courts. Recent years have seen cases filed against public financial institutions, including central banks (see *ClientEarth v. Belgian National Bank*) and export credit agencies (see *Friends of the Earth v. UK Export Finance; Kang et al. v. KSURE and KEXIM*).
- Challenges may be made to government procurement processes or funding decisions (see *Africa Climate Alliance et al. v. Minister of Mineral Resources & Energy et al*. [the '#CancelCoal case']; *PSB v. Brazil* [on the Climate Fund]; *Conectas Direitos Humanos v. BNES and BNDESPAR*). The fiscal regime for domestic oil and gas production has been the subject of at least one case, in *Cox et al. v. The Oil and Gas Authority ('the Paid to Pollute case'*).
- Ministries of Finance may find themselves challenged in the absence of policies considering climate protections, or on the basis of insufficient consideration of how climate change might affect price and financial stability (see *R (People & Planet) v. HM Treasury*; and *ClientEarth v. Belgian National Bank*).
- Ministries of Finance might be held accountable for not disclosing the risks of climate change to sovereign bond investors. There is already one example of this type of litigation, in the ongoing case of *O'Donnell v. Commonwealth*, a case filed in July 2020 against the Commonwealth of Australia and the Secretary to the Department of the Treasury.
- Ministries of Finance might be implicated in ensuring the implementation of relevant judgments against other government departments. They may face repercussions from the financial risks resulting from climate-related litigation against private financial institutions. In the words of the Network for Greening the Financial System, "Climate-related litigation may have significant financial implications, not only for the defendant to the litigation, but also for other institutions with financial exposures to the defendant, including financial institutions" (NGFS, 2021a).

To respond, legal teams in Ministries of Finance should:

- Take steps to familiarize themselves with recent developments in transnational climate change law and ensure that relevant legal principles are incorporated into decision-making processes.
- Work with other government departments to ensure that these departments are also engaging with this fast-developing area and enable mutual learning on the subject.
- Work with regulatory agencies and public finance institutions supervised by the Ministry to ensure that they are also aware of the risk of litigation to those institutions.
- Work to ensure the development of clear guidance on how climate considerations should be incorporated in government spending decisions, and guidance on the management of climate risks and impacts by the public and private sectors.
- Equip themselves with a robust understanding of climate litigation against corporate actors, to anticipate and mitigate risks to the broader financial system.

Source: Prepared by Joana Setzer and Catherine Higham (Grantham Research Institute, LSE). The referenced cases and others can be found on www.climate-laws.org and www.climatecasechart.com.

Opportunities for action

Ministries of Finance should review their overall tax revenue system and then make necessary adjustments to ensure it is ready for net zero. This should include identifying new sources of tax revenue for sustainable infrastructure investment and preventing unplanned declines in tax revenues from the production and consumption of fossil fuels.

Ministries of Finance should:

- Make a coherent net zero tax strategy a key element of budget processes and commit to future-proofing future tax policy changes.
- Consider the use of net zero tax audits to ensure that the current tax system supports the transition. This should cover all taxes, not just environmental taxes.
- Take responsibility for supporting households and businesses through the transition, with a focus on cushioning any tax changes for low-income households, which will be critical to maintaining public consent.
- Invest in the development of sufficiently robust fossil fuel revenue data to form the basis for assessing the fiscal consequences of diversification of the economy away from fossil fuel production and electrification of transportation.
- Consider investing in the technology for a large uptake of distance-based road user charging.

Ministries of Finance should take steps to enhance the resilience of the economy to physical climate and transition risks to reduce their impacts on the public purse, including by addressing the potential impacts of growing risks on the cost of borrowing and contingent liabilities with known or unknown impacts. They should consider:

- Using the latest methodologies to improve assessment and surveillance of climate-related risks.
- Using these assessments to invest at scale in sustainable infrastructure and wider measures to finance enhanced national resilience to climate shocks.
- Setting up national mechanisms that enable quick financial responses to disasters to be put in place. This might include contingency funds, credit lines, traditional insurance, and insurance in the form of catastrophe risk bonds and regional risk pools that help to transfer risk and enable fast recovery (see further detail in Function 3d).
- Including contingent liabilities from physical and transition risks in the fiscal planning and budget process.
- Introducing climate and nature stress-testing requirements for financial institutions.
- Working with central banks to better understand and manage sources of vulnerability for the macroeconomy and the financial system, such as setting up a national climate risk board.
- Considering how to build natural disaster clauses into debt management strategies with creditors.

In reviewing the tax revenue system, Ministries of Finance should identify new sources for sustainable infrastructure development and prevent unplanned declines in revenue from fossil fuels.

2) Mainstreaming climate in the budget

Function 2c. Using the budget to drive transformation in all sectors of the economy, including through annual budgets and medium-term expenditure frameworks[32]

Context and role of Ministries of Finance

The Ministry of Finance's central role in the budget formulation process is potentially the most important entry point for driving climate action (Petrie, 2021). Existing annual and multi-annual budget allocations are woefully inadequate for tackling the scale of operating and capital expenditure needed for the transition, including to support the implementation of NDCs, NAPs and LTSs (see Function 1). In a review of $18 trillion in recent COVID-19 rescue and recovery packages, only 5% was green, totaling less than $1 trillion (O'Callaghan et al., 2022a). Accelerating climate action will thus require increasing or redirecting the allocation of public sector resources toward policies and investments that support mitigation and adaptation measures in a manner consistent with other national development priorities such as reducing poverty or enhancing sectoral outcomes (e.g. in education, health or security).

This is not simply about Ministries of Finance understanding the climate impacts of public spending: they need to use the budget process to drive transformation and new investment across all sectors of the economy. This requires embedding a national vision and strategy for green transformation within all aspects of the budget cycle, along with embedding green investment and expenditure within the formal processes Ministries of Finance use for the development and approval of their national development plans and strategies (NDPs), medium-term fiscal frameworks (MTFFs), and multi-annual budgets and frameworks.[33] It also requires working closely in partnership with the main spending line ministries.

In the last five years the use of so-called 'green budgeting' approaches has assisted this agenda. The OECD defines these as the use of the budget process to help drive improvements in the alignment of fiscal policies with environmental goals (OECD, 2017c). The OECD Paris Collaborative on Green Budgeting was formed in 2017 to assist countries with the integration of climate and environmental objectives into budgeting. Its work is based on encouraging countries to strengthen their capabilities in seven key areas, including developing a clear definition of green spending and integrating climate and environment commitments into existing budgets and budget frameworks.

Ministries of Finance should also leverage established public investment management (PIM) systems as a critical component of the budget process in advancing climate action (see also Function 2c). PIM concerns the regulations and processes for assuring that public assets and planned public investments contribute to a government's overall goals. A functioning PIM system involves appraisal techniques to assess the policy fit and value for money of planned investments as part of the capital investment requirements outlined in budget submissions by line ministries. Ministries of Finance should consider introducing 'climate-smart' PIM to build on these processes by screening and rejecting project proposals that are not aligned with climate goals. The

[32] This section draws heavily on contributions from Peter Murphy and Murray Petrie (Expert Advisory Group).

[33] These processes, at various levels of sophistication, aim to inform and integrate public policy planning and decision-making by reconciling desired policy priorities, outcomes and outputs over time with projected resources required for implementation. In most countries the processes (and outputs) are established in legal and regulatory frameworks (Public Financial Management Acts, PFM Regulations and MoF instructions) that define roles, relationships and responsibilities.

independent review of project proposals, typically by a PIM unit located within the Ministry of Finance, is key and will require the PIM unit to develop skills in climate change risk assessment and relevant green construction standards.

Appendix 2 highlights in detail the key entry points for mainstreaming climate action within the typical budget process based on expert input. It includes examples of entry points for mainstreaming climate action within the budget process relevant to Ministries of Finance, line ministries and other actors involved in the budget management process, and shows ample opportunities for doing so, including in the Budget Framework Paper, updates to the medium-term fiscal framework and medium-term budget framework, in line ministry guidance and submissions, updates to macro-fiscal forecasts, budget circulars, budget hearings, and the review of final submissions.

The initial strategic phase of the budget formulation process is an especially pertinent opportunity for the Ministry of Finance to influence and help drive the policy debate on climate action. This stage involves a strategic debate on the overall level of available resources and on how these resources are to be allocated over time. The overall objective of the Ministry of Finance is to ensure the cabinet of ministers expresses its position early in the fiscal planning and budget process on key spending policy priorities, including those related to green economic transformation, and any indicative shifts in revenue, debt and budgets needed to accommodate these priorities. This is often reflected in a national medium-term Budget Framework Paper (BFP), a critical document that creates the policy framework through which the executive and Ministry of Finance ensure the government's policies and the fiscal envelope are considered in the strategic plans of line ministries. Ministries of Finances have a key responsibility for designing the BFP submission information and analysis requirements by line ministries.

To avoid late-stage 'blocking' of resource allocations for green economic transformation, Ministries of Finance should provide clear guidance to line ministries on the requirements for strategic budget submissions. This should include guidance on ways to:

- Assess and communicate the economic, social, environmental and distributional impacts of new climate policies and investments, with a focus on how they contribute to wider national development goals.
- Consider different policy options and the trade-offs between existing and new policy measures.
- Strategically assess the fiscal and budget implications (tax, investment, grants, subsidies, regulatory) of new or revised public policy measures and investments overall and at the line ministry level.
- Address the strategic barriers to proposed implementation, including assessing implementation capacity and availability of necessary complementary inputs.
- Assess the key shifts in sectoral resource allocations required to fund the new or revised policies and investments in the context of current and future fiscal space.

On receipt of line ministry strategic plan submissions, the Ministry of Finance should assess their suitability by referring to the appraisal criteria highlighted above. Once the plans and resource requirements are discussed and agreed, the Ministry of Finance should be able to compile a first draft budget framework paper and cabinet guidance on fiscal measures and spending ceilings. Sector working groups and lead line ministries will then use this guidance to support revision of their strategic plans.[34] This forms the basis for the next detailed stage of the budget preparation process.

[34] The revision process will inevitably involve further discussion of the optimal strategies and policy priorities, the trade-offs between them, and the impact of policy changes on different stakeholders. Broad engagement with all stakeholders and transparency in discussions are likely to be helpful in generating consensus between stakeholders on the way forward.

Ministries of Finance should work closely with line ministries as they prepare detailed budgets for submission and approval by the legislature in the budget preparation phase. Ministries of Finance can provide line ministries with more detailed information on the economy, efficiency and effectiveness of current and new climate policy measures and investments to ensure value for money. Where appropriate, an output-based budget framework can be helpful in the establishment of appropriate performance indicators for measuring and monitoring the outcomes of specific policy measures.[35]

The Ministry of Finance will then play a critical budget challenge function once the detailed line ministry submissions are submitted. Their aim should be to ensure that:

- The submission reflects the previously agreed strategic priorities for the line ministry.
- The associated line ministry medium-term resource envelopes (ceilings) are respected.
- Appropriate consideration is given to alternative policy options or trade-offs.
- The classification and costing methodology applied to expenditure proposals is credible (particularly for any large-scale investments or other expenditure with substantive costs, financing or fiscal risk implications).

In the final budget execution and reporting phase the Ministry of Finance should play a significant role in monitoring the efficiency and impact of climate policy implementation. Ministries of Finance typically work with line ministries in the establishment of financial management systems, standards, procurement systems and training of staff involved in all aspects of budget execution and financial reporting. It will be no different for climate action.

When mainstreaming climate action into the budget process, Ministries should also consider overlaps and synergies with other priorities. For instance, most African countries have some experience of either gender-responsive budgeting (that tries to ensure gender-equitable resource distribution and contribute to equal opportunities) or climate-budgeting. However, these two forms of budgeting have largely been implemented as separate reform agendas. A more integrated approach is supported by international frameworks such as the UNFCCC's Gender Action Plan, which aims to promote gender-responsive climate policy and the full, equal and meaningful participation of women. It is also partly supported by the similarities in the approaches and technical tools used for gender-responsive budgeting and climate-responsive budgeting, as both have small, dedicated budgets and most public expenditure will impact on them. A more integrated approach could also facilitate access to international climate finance as social equality has become one of the key criteria for accessing climate finance from global climate funds such as the Green Climate Fund and the Global Environment Facility (see CABRI et al., 2022).[36]

Barriers to action and ways to overcome them

Political, organizational, technical and behavioral challenges frequently constrain or create barriers to the use of budget management processes to drive climate action. Table B2 illustrates some of these barriers and suggests strategies to overcome them. Doing so will usually require substantive political and technical leadership to drive through reform efforts within Ministries of Finance as they work closely with other government departments. In many countries this could involve a shift in the organizational culture and structures, staffing and skillsets in Ministries of Finance to support policy-based planning, budget and execution processes related to climate action, as described in the Capabilities section below.

[35] Commonly used, output-based or results-based budgets are intended to hold budget managers to account for their role in organizing the supply of goods and services to the public, and to enforce a regular review of the effectiveness of government expenditure programs.
[36] Paragraph based on a contribution by Shanaz Broermann (CABRI).

One point of emerging consensus is that green PFM and budgeting approaches do not require entirely new approaches but rather an adaptation of existing processes and tools that can be factored into existing PFM reform agendas (Eguino and Delgado, 2023). Consensus is also growing around the need to consider the entire budget cycle and all public sector and extra-budgetary expenditure, including those of subnational governments and state-owned enterprises. A wide range of existing and new tools are starting to facilitate green budgeting and PFM practices, including budget tagging, dedicated green budgets, green audits and accounting statements, environmental impact assessments, and budget scoreboards. Some countries are introducing green PFM approaches that aim to adapt existing public financial management practices to support climate-sensitive policies. Ministries of Finance could also learn from private sector efforts to disclose their exposure to climate risks through frameworks such as the recommendations by the Task Force on Climate-related Financial Disclosure (TCFD), applying similar approaches to the development of budgets.

Despite progress by some countries, green budgeting and PFM practices remain relatively nascent and the impacts unclear. According to the OECD (2021a) 14 out of 35 OECD countries surveyed in 2020/21 (40%) reported that they have practiced green budgeting, and another nine that they plan to introduce some green budgeting practices in the future. A joint OECD-EC survey on green recovery packages found that seven out of 21 countries recently stated that they use some form of so-called 'green budget tagging' to understand the environmental impacts of existing government spending priorities, positive and negative (ibid.). Ten Latin American and Caribbean countries have some kind of tagging or budget classification mechanism to identify climate expenditure (Eguino and Delgado, 2023). However, these assessments tend to find the percentage of public spending undermining climate goals vastly outstrips that which positively contributes (ibid.). Hence, it is critical that added attention is given upstream by Ministries of Finance to using the budget process as a whole to drive climate action linked to delivering and financing the goals outlined in national climate commitments and strategies.

Table B2. Strategies for overcoming barriers to climate action in the budget process

Barriers to action	Impact on Ministry of Finance climate action capability	Ministry of Finance strategies for overcoming challenges
Inadequate engagement by decision-makers (political/ executive) in the strategic budget formulation process.	Can limit policymaker understanding of green budget priorities and their commitment to providing necessary resources for climate action.	Strengthen strategic phase to ensure effective engagement by decision-makers through: • Regulatory requirements for submission of national Budget Performance Report (BPR) to legislature incorporating key line ministry policy changes reconciled to medium-term fiscal framework (MTFF) • Creating a clear budget calendar that provides for policymaker decisions on strategic issues and binding resource allocations.
Limited capacity to develop a substantive understanding of a range of policy options for climate action across multiple sectors.	Constrains ability to coordinate and provide leadership on climate policy development.	Develop capacity of fiscal and budget management functions to undertake analysis of climate policy options and ensure teams responsible for liaison with line ministries have skills (finance, economic, technical, organizational, political) to support this type of climate policy analysis.
MTFF formulated too late or inadequately in the budget cycle leading to unrealistic budgets and allocations.	Prevents early commitment of policymakers to sufficient aggregate and sectoral resourcing of climate action and investment.	Ensure the MTFF and associated climate change strategy and policy guidance to line ministries is provided in a timely and transparent manner.
Strategic budget phase is not underpinned by adequate output and impact analysis or climate policy measures.	Constrains policymakers' capacity to allocate available resources in an efficient and effective manner in accordance with national climate priorities.	Provide crosscutting and specific guidance on analytical approach and methodology for review of budget submissions involving climate policy proposals (capital and recurrent) during strategic phase of the budget process.
Late, inadequately appraised (technical, financial, political etc.), programmed climate investment proposals.	Compromises availability of fiscal space and selection of suitably appraised climate-related projects and policy measures, undermines expenditure outputs/outcomes.	Ensure all line ministry projects and policy measures have been properly appraised prior to inclusion in stock of potential investments and eventually programmed for inclusion in the budget.
Ineffective performance management, budget classification, and monitoring framework.	Limits ability of policymakers to make sound decisions on budget execution and to monitor achievement of expected outputs and outcomes of climate actions.	Ensure all public sector entities utilize unified and standard budget classification systems for budget formulation, execution and accounting and map to climate change activities requirements to facilitate transparent monitoring and reporting.
Insufficient fiscal risk analysis results in inadequate picture of potential fiscal risks from climate action (and inaction) to the budget.	Limits understanding of impact of climate measures on budget, creating incentives for blocking proposals by line ministries. Limits understanding of risks from decentralized agencies.	Ensure capacity to monitor and assess specific fiscal risks from climate action and expand disclosure of climate and nature-related fiscal risks in the budget (transition and physical climate risks). Ensure effective oversight of fiscal risks emanating from decentralized entities (local government, SOEs).
Vested interests seek to preserve existing rents and lobby against policy interventions.	Distorts benefit/risk analysis and undermines adoption of green transformation measures.	Create capacity to better understand economic case for action and sector trade-offs. Engage with relevant stakeholders transparently to inform and communicate analytical and policy framework for climate change-related policy design and development. Just transition measures should be considered for impacted sectors and regions.

Source: Authors

Various international and regional institutions are developing guidance and tools that address green PFM and budgeting in considerable detail. They include:

- The OECD Paris Collaborative on Green Budgeting is working in close partnership with governments and experts to co-design practical and pragmatic approaches.
- The Sustainable Budgeting Approach (SBA)[37] is a decision-support framework for helping Ministry of Finance officials to make informed and high-impact budgetary decisions, particularly under constrained fiscal space (O'Callaghan et al., 2023). The SBA incorporates leading socioeconomic and environmental science to give country-specific perspectives on the potential consequences of budget options in terms of development (e.g. jobs, growth), the environment (e.g. climate change mitigation and adaptation, nature, air pollution), and society (e.g. wealth inequality). It enables informed trade-offs in policy decision-making while also allowing for more informed and granular budget tagging.
- The Inclusive Budgeting and Financing for Climate Change in Africa (IBFCCA) program is a partnership between CABRI, UNDP and IIED. It focuses on 'double-mainstreaming' gender and climate change into public financial management systems (CABRI et al., 2022).
- The World Bank has produced detailed guidance on climate budget tagging (World Bank, 2021d), with a major review of international experience. Feedback from World Bank experts working with Ministries of Finance suggests that budget tagging can be useful (especially for awareness raising), but it is important to determine an appropriate method based on who will use the information to inform what kind of decisions, and to consider using program-level expenditure reviews, inclusion of expenditure with adverse climate impacts, getting the right people involved (including line ministries), and balancing comprehensiveness with the ease of implementation offered by more targeted approaches. A focus on impacts and the alignment of spending as a whole is critical.

One particularly promising avenue is the mainstreaming of climate action in **public accounting standards**. The important role that Ministries of Finance can play in driving this process is outlined in Box B8.

Real world examples

A growing number of countries are exploring ways to embed climate action within budget cycles. For example:

- **France** published its first Green Budget in 2020 led by an interdepartmental working group comprising the Ministry of Finance (the Directorates of Budget, Treasury and Economic Analysis, and Tax Policy) and the Ministry of Ecological and Inclusive Transition. The Budget Directorate guided line ministries on how to use the methodology in preparing their 2021 budget proposals.
- **Nepal's** Ministry of Finance includes a Climate Budget in its Consolidated Financial Statements, Economic Survey Report, and in a table annexed to the annual Budget.
- Other countries such as **Indonesia, Kenya** and the **Philippines** have introduced climate budget tagging.
- **Canada's** Strategic Environment Assessment for all policy and program proposals goes even further and represents an important example of an elaborate scheme to account for sustainability and environmental effects of funding and other activities by the public sector. Canada has created guidelines to instruct federal departments and agencies in how and under which circumstances strategic environment assessments are to be performed. Importantly, strategic environment assessments need to consider environmental effects as well as potential mitigation needs (Government of Canada, 2010).
- The **EU** supports the implementation of green budgeting practices across its member states through a green budgeting reference framework and technical support and training to Ministries of Finance in more than 20 countries (see also Box B23). The **European Commission** has collaborated closely with the IMF and the OECD to develop common grounds for green budgeting practices (EC et al., 2021).

[37] The SBA was successfully piloted in Gabon in 2021 in cooperation with UNDP Gabon. It was developed by the Smith School of Enterprise and the Environment at the University of Oxford with support from UNEP. The approach defines around 250 policy archetypes, each of which is assessed for its potential directional impacts against social, economic and environmental criteria, using the latest available research and evidence.

Box B8. Mainstreaming climate action in public sector accounting standards

Public accounting determines how economic performance is measured, establishes accountability, and forms the basis for public decision-making. Public sector accounting standards are critical to ensuring that the activities of public institutions are transparently recorded.

In the private sector initiatives such as the creation of the International Sustainability Standards Board (ISSB) are underway to improve the accounting and performance measurement of climate, environmental, social and governance factors of firms. In contrast, such developments are still nascent in the public sector. Nevertheless, Ministries of Finance can build on and adopt existing global standards issued by the transnational standard setter of public accounting—the International Public Sector Accounting Standards Board (IPSASB).

Ministries of Finance can actively contribute to the development of public sector sustainability reporting in two key areas:

1. Developing global public sector sustainability reporting standards by the IPSASB

Invited by the World Bank in early 2022, which explicitly acknowledged the Coalition of Finance Ministers as an important stakeholder, IPSASB initiated a consultative process for the development of a framework for climate and nature reporting (World Bank, 2022c). Following strong encouragement as part of the consultation process, IPSASB will likely proceed to produce public sector sustainability reporting guidance by the end of 2023 (IPSASB, 2022). There are two entry points Ministries of Finance can consider:

- As key operators of public sector accounting systems and potential principal users of public sector sustainability guidelines, Ministries of Finance can contribute to the drafting process and augment the guidelines with practical experience and ensure its suitability in practice.
- Ministries of Finance should consider supporting and financially contributing to IPSASB given that pertinent, globally applicable guidance on sustainability reporting offers the chance to significantly drive progress on nature and climate reporting in the public sector would produce significant economies of scale compared with individually created guidance by each Ministry of Finance, and would enhance global comparability of Ministries' sustainability performance.

2. Transitioning to accrual accounting systems to make use of its benefits and build on existing public accounting standards to account for climate change-related effects

In the context of improving and greening public financial management systems, Ministries of Finance can consider evolving national accounting systems from a cash to an accrual basis. Accrual accounting records economic events when they occur, records all assets and liabilities, and improves monitoring of liabilities and contingent liabilities, including environmental obligations (IMF, 2016). There are two potential benefits for Ministries of Finance:

- Support in efforts to transform economies to net zero, with increased transparency and accountability and an improved ability to implement public policies (Cuadrado-Ballesteros and Bisogno, 2021).
- Support to make use of existing accounting guidelines issued by IPSASB that can partly reflect the effects of climate change. Examples include estimations on asset valuations that may be impacted by climate change or accounting for provisions arising from obligations to comply with climate change-related laws or regulations (IPSASB, 2020).

Source: Prepared by Timothy Randall (formerly Grantham Research Institute, LSE)

Opportunities for action

More Ministries of Finance need to actively use the budget process to drive the scale of transformation and new investment in all sectors of the economy. They should use the entire budget cycle to drive sustainable and resilient transformation and investment. This should build on existing PFM processes and include:

- Using their budget coordination and challenge responsibilities to ensure that strategic and detailed line ministry budgets are formulated in a manner that fully reflects government climate action strategies and identified investment needs.
- Providing active guidance to line ministries at each stage of the budget cycle to ensure that they mainstream climate action into their budgets and provide information on the fiscal implications of proposed policies and investments.
- Ensuring that climate action is not a standalone adjunct to budget formulation and execution but rather a benchmark against which mainstream budget proposals are assessed, approved and implemented.
- Enhancing the capacity of the Ministry of Finance to mainstream climate action into the budget cycle through boosting its analytical, coordination and communication capabilities, including by drawing on a range of existing and new tools such as the Public Expenditure and Financial Accountability (PEFA) climate methodology, budget tagging approaches, and new detailed guidance.
- Contributing to the development of globally applicable public sector accounting standards and sustainability reporting. Ministries of Finance can do this by supporting the work of IPSASB and can consider adopting accrual accounting and existing IPSASB guidelines, which can help them reflect the impacts of climate change in the reports of public entities.

Function 2d. Greening public investment management

Context and role of Ministries of Finance

Integrating the results of overall investment planning exercises into public investment management, and subsequently into the public financial management and budget processes, is an essential part of the transition to net zero and enhanced resilience. The imperative for greening public investment management is threefold:

- First, while private finance will play an increasing role in realizing climate investments, a massive ramp-up in green public investment is needed to meet investment needs (Songwe et al., 2022; World Bank, 2023).
- Second, substantial public investment will be necessary to build public infrastructure that makes economies more resilient to climate change and natural disasters. A failure to consider adequately the impacts of both physical and transition risks on public investment will not only increase the vulnerability of infrastructure and its users, but also increase the value of exposed economic assets that can turn into 'fiscal time bombs' (Coalition of Finance Ministers for Climate Action, 2021b).
- Third, government investments directly affect how households and businesses respond to the transition to a zero-carbon economy, and how they prepare for a future that is resilient to climate change. Public investment in infrastructure offers an opportunity for governments to catalyze growth in emerging net zero-emission industries and incentivize rapid deployment (ibid., 2022d).

Yet, public investment in most countries is currently neither sufficient, nor sufficiently green, for a successful zero carbon transition. As outlined in Part A, public investment in many countries has been on a downward trend since the global financial crisis, followed by a collapse after the outbreak of COVID-19, from which emerging markets and developing countries are yet to recover (ibid., 2021b). A significant ramp-up in investment will be

needed to meet climate targets. At the same time, most countries do not yet systematically include climate change considerations in their public investment management process, resulting in a lack of alignment of public investment with climate targets. Box B9 highlights some of the challenges countries in Latin America and the Caribbean are facing with regard to their public investment planning processes.

The integration of resilience and adaptation into public infrastructure planning is equally important. In low- and middle-income countries alone, damages from natural disasters to power and transportation infrastructure are already estimated at around $18 billion per year (Hallegatte et al., 2019). The good news is that building in resilience does not need to be expensive. A recent World Bank report finds that the extra cost of ensuring resilient power, water and sanitation, transportation and telecommunications systems makes up only 3% of overall investment needs. Given the substantial benefits of resilience, including fewer disruptions and economic impacts, the net benefit of investing in more resilient infrastructure in developing countries is $4.2 trillion globally, with $4 in benefits for each $1 invested (ibid.). Better integration of adaptation and resilience will require systematic screening of public expenditure to ensure consistency with adaptation targets (ibid.).

Ministries of Finance need to ensure public investment management systems are aligned with their national climate strategies and overall investment plans. To do so, they can ask themselves the following questions (Mukhopadhyay et al., 2022):

- Are public investment plans aligned with national climate and disaster risk management objectives, NDCs, the SDGs, and commitments made under the Paris Agreement?
- Are climate considerations integrated with public investment management across the public sector at the national and subnational levels, in state-owned enterprises, and in public–private partnerships?
- Does the public sector include assessment of climate mitigation and climate and disaster resilience in the appraisal and selection of investment projects?
- Do the annual budget and other fiscal tools, such as the medium-term fiscal framework, financial statements, asset management and project audits, take climate and disaster risk into account and do they factor in the benefits of investing in climate-related public goods? (See further detail in Function 3.)

Ministries of Finance can play a key role in ensuring climate considerations are integrated into all stages of public investment management. This includes: supporting the development of sectoral infrastructure plans aligned with adaptation and decarbonization objectives, to facilitate the identification of new projects and avoid investment assessments that only marginally reduce emissions and increase the risk of stranded assets; incorporating physical risk analysis and management into the evaluation of infrastructure projects; estimating and applying the social price of carbon in the ex-ante evaluation of projects; incorporating resilience criteria into sustainable infrastructure maintenance projects; and assessing the impact of sustainable infrastructure on the different dimensions of sustainability (Eguino and Delgado, 2023).

Integrating the results of overall investment planning exercises into public investment management, and subsequently into the public financial management and budget processes, is an essential part of the transition to net zero and enhanced resilience.

Box B9. The state of public investment planning in Latin America and the Caribbean (LAC)

Eguino and Delgado (2023) highlight the need to further integrate climate action into public investment strategies in LAC. They find that:

- There is a weakness in public investment planning instruments, which has a significant impact on the alignment of investment programs that contain national decarbonization commitments and resilience priorities.
- With the exception of Colombia and Mexico, the countries of LAC do not yet have taxonomies of green projects to guide public and private investors (Chile and the Dominican Republic are in the process of developing taxonomies).
- Most countries in the region do not have tools or models to prioritize projects according to their contribution to climate action.
- The use of methodologies for preparing and evaluating investment projects is still embryonic in the region. For instance, only three countries systematically include the analysis of risk to climate events in the evaluation of public projects.
- The limited integration of the climate dimension into the management of investment projects significantly restricts the ability to establish portfolios of projects that can be subject to green or sustainable financing.

Source: Adapted from Eguino and Delgado (2023)

Barriers to action and ways to overcome them

Over the past decade, most parts of the world have seen low public investment rates, largely due to weaknesses in national planning systems and limited fiscal space. Not only will public investment have to be made climate-resilient: it will also have to be scaled up substantially in most countries to meet climate and development targets (see Part A). However, this is likely to be complicated by a range of factors, including:

- **Outdated public investment management practices and tools.** The greening of public investment planning is hindered by the fact that most public investment systems are not yet geared toward taking climate into consideration. There is a lack of tools for incorporating climate action into all phases of the project cycle. Tools such as cost–benefit analysis fail to take account of the socioeconomic costs of emissions, or the savings made from more resilient infrastructure leading to avoided disruptions (see Capability 3).
- **Difficulties in project selection and prioritization**. The lack of alignment between investment plans and climate targets (see Function 2a), makes it difficult to prioritize projects. A lack of capacity and sound data can further complicate project selection.
- **Coordination failures.** Public investment planning is often complicated by a lack of coordination between the many stakeholders involved, including different government departments and levels of government, and the private sector through public–private partnerships.
- **Fear of excessive bureaucracy.** Introducing new 'green' standards often causes fears that public investment planning will be made more bureaucratic, further complicating investment planning and slowing down implementation.
- **Limited fiscal space.** In many countries, fiscal rules that constrain public indebtedness and concerns around debt sustainability can obstruct governments from realizing the necessary investments.

Overcoming these barriers will require Ministries of Finance to better integrate climate action into national investment planning systems, and also to strengthen public investment planning systems more generally. To target the latter, the IMF has developed the Public Investment Management Assessment (PIMA), which helps countries improve the institutions and processes for infrastructure governance. A new PIMA module has been developed that improves on the original by taking climate considerations into greater account. This Climate-PIMA (or 'C-PIMA') can help governments identify potential improvements in public investment institutions and processes specifically to build low-carbon and climate-resilient infrastructure (IMF, 2022d). The World Bank's climate risk screening tools can also help assess possible climate change or disaster risks to investment projects and identify interventions for reducing risk and increasing resilience.

Integrating climate considerations into existing investment planning processes is considered more effective than setting up additional processes that can create additional burdens. Ministries of Finance with limited capacity to fully integrate climate into their processes can also start small: a simple set of screening questions can avoid bad investment decisions that lock in emissions for decades to come. For instance, greater scrutiny should automatically be paid to fossil fuel-related infrastructure (Orozco and Jaramillo, 2022). Recent feedback from World Bank experts working with Ministries of Finance suggests a focus on screening physical and transition risks early in the preparation of all projects and conducting detailed appraisal for the largest and highest impact projects can be an effective initial approach (World Bank, 2022d). To ensure sufficient fiscal space, Ministries of Finance can also consider updating fiscal rules that govern public spending so that they explicitly support investments in decarbonization and resilience (see also Function 3a). And they can broaden their debt sustainability analyses to take into account the positive long-term effects of climate spending on debt costs and growth (World Bank, 2023).

Real world examples

While progress has often been limited and confined to pilot projects, many countries are now working on greening their public investment planning. For example:

- The **Mexican** Ministry of Finance and Public Credit, with support from the Inter-American Development Bank and the British government, has developed a set of quantitative sustainability indicators to be included across all projects' cost–benefit analysis used for their internal public investment prioritization process. This tool will support the Ministry in integrating climate action into analysis of its project portfolio and to prioritize projects with higher environmental, social and economic multipliers at the federal level (Delgado et al., 2021).
- In **Peru** the Ministry of Economy and Finance published General Guidelines for the Ex-Post Evaluation of Public Investment Projects in 2012, the methodology for which includes disaster risk identification along with economic cost–benefit analysis (ibid.).

Most advances have been made around disaster risk screening for infrastructure investments. For example:

- **Ethiopia** depends heavily on rain-fed agriculture and is therefore particularly vulnerable to changing weather patterns caused by climate change. In response, the government announced public investment management guidelines that incorporate climate risk screening tools into public investment decision-making and project planning. Each project is assessed by its exposure to adverse climate effects and impact assessments are used to evaluate how they may affect a project's operations. 'Adaptive capacity' assesses how non-physical aspects of a project such as institutional capacity can reduce the risk level. Assessment of the overall risk of the project on this basis is a prerequisite for submitting a proposal to the Ministry of Finance for funding and the process is designed to support Ethiopia in building its climate resilience and incorporating climate into public investment management processes (Coalition of Finance Ministers for Climate Action, 2022d).
- **Chile** has developed a methodology for assessing disaster risk in public infrastructure projects, with the analysis to be incorporated into the preparation and evaluation of projects submitted to the National Investment System. It serves to guide planners, evaluators and decision-makers in the design and execution of infrastructure projects

in areas exposed to disaster risk threats, taking into account not only their suitability but also the possibility of mitigation or adaptation measures (Delgado et al., 2021).

- In **Costa Rica** the Ministry of National Planning and Economic Policy has integrated disaster risk analysis and management into the investment project lifecycle as part of the National Public Investment System. Steps covered include analyzing the location of projects, identifying vulnerabilities, quantifying project risks from natural disasters, analyzing risk reduction alternatives, and quantifying the costs and benefits of disaster risk mitigation (ibid.).

Opportunities for action

Aligning national climate plans with public investment planning is essential for ensuring that countries accelerate investment in the reliable, resilient and green public infrastructure needed for a successful transition to net zero. To do so, Ministries of Finance should:

- Ensure alignment between public investment planning and national decarbonization and resilience strategies, including NDCs, LTSs and NAPs.
- Integrate climate action and disaster risk management into all stages of the project cycle for developing public investment projects, including by investing in the greening of project planning and selection tools and instruments.
- Ensure coordination between the relevant government agencies responsible for planning and implement low-carbon and climate-resilient infrastructure.
- Ensure integration of public investment processes into the budget and PFM processes.

Function 2e. Greening public procurement[38]

Context and role of Ministries of Finance

Connected to the use of public budgets is public procurement, which amounted to $11 trillion out of global GDP of nearly $90 trillion in 2018, or 12% of global GDP (Bosio and Djankov, 2020). In Latin America and the Caribbean, for example, this represented 17.4% of total government spending (ibid.). Procurement policies and management can make an important contribution to reducing greenhouse gas emissions and enhancing resilience.

Ministries of Finance usually play a major role in establishing legal and policy frameworks for public procurement to assist procuring entities in their procurement procedures. 'Green public procurement' is the process by which authorities seek to procure goods, services and works from the private or third sectors with a reduced environmental impact throughout their lifecycle compared with goods, services and works with the same primary function that would be procured otherwise (World Bank, 2021b).

The impact of green procurement is particularly relevant in sectors where public procurement represents a significant percentage of the market, such as the buildings and construction sector, public transportation, and health services (OECD, 2015a). The most common areas for implementing green procurement include goods (e.g. vehicles, office supplies, fuel); services (e.g. electricity, food, data centers); and public works (e.g. airports, buildings, power plants). There are many possible applications, from supporting low-carbon forms of travel, to ensuring that all public buildings are energy-efficient and climate-resilient, to sourcing local and organic food for schools.

Due to the economic weight of the public sector, sustainable public procurement can generate benefits in terms of the development of new technologies that can accelerate changes in patterns of consumption and resource use (European Commission, 2016; OECD, 2015a).

[38] This section draws heavily on Eguino and Delgado (2023).

The use of public procurement as a strategic policy instrument is not a novel idea, but only relatively recently has it become an important trend. The OECD in particular has called for the more strategic use of public procurement to contribute to the 2030 Agenda for Sustainable Development to support a more resource-efficient economy, stimulate innovation, support SMEs, and promote social values. In recent years, citizens' expectations have grown, with calls made in many countries for greater accountability in government procurement decisions (OECD, 2015a).

Implementing sustainable public procurement across governments could drive significant benefits for Ministries of Finance by making it possible to: reduce the consumption of resources, such as utilities and energy; avoid the emission of waste and pollutants; increase the quality of goods and services purchased; protect biodiversity; reduce environmental protection costs; increase transparency and enable better value for money in the analysis of private sector bids; promote innovation and green jobs; and work strategically with suppliers (ibid.). Green procurement can also bring political benefits with potential savings that can be invested in other public sector initiatives (European Commission, 2016).

Recognition of the potential net benefits to Ministries of Finance from introducing green procurement practices across government is growing. A study by Melero Pinto et al. (forthcoming) shows, for example, that the costs of efficient products such as computers, printers and lighting fixtures are often significantly lower than the costs of using conventional products. The German city of Regensburg recently used green public procurement to help save €10 million in energy and water costs over a 15-year period (ibid.). And there is important evidence that green procurement can have an impact on the market through catalyzing the design and production of innovation and new technologies (Salazar Cota et al., 2018), although more research on impacts is required. The European Commission's *Buying Green* handbook (2016) offers a useful summary of the net benefits of green procurement.

Barriers to action and ways to overcome them

The adoption of green procurement policies and regulations brings challenges that include:

- **Lack of capacity.** For effective green procurement it is necessary to have staff in the public purchasing agencies with the technical capacity to promote it and sufficient suppliers with the capacity to provide works, goods, services or consultancy with the desired characteristics.
- **Knowledge gaps.** There is a need to raise awareness among buyers and end-users about green procurement and to clarify the priorities and values to be achieved with public procurement.
- **Lack of environmental criteria for integration into products and services.** For many products and services, there are no clear or verifiable criteria that public authorities could use to incorporate environmental considerations into their bids while complying with the requirements of procurement regulations.
- **Conflicting priorities.** In making procurement decisions, policymakers and procurement officials face the need, whether actual or perceived, to balance traditional procurement objectives (such as efficiency, economy or performance) with sustainability and environmental objectives.
- **Weak coordination.** In many countries, different ministries run climate and environmental programs with limited coordination with dedicated procurement agencies, leading to a lack of coherence between procurement and the country's overall climate environmental objectives.
- **Impact on small and medium-sized enterprises (SMEs).** In smaller countries, finding suppliers of green products can be difficult. When applying special criteria, care must be taken to ensure that they do not negatively impact SMEs.
- **Global standards.** There is currently a lack of consensus over which standards should be globally recognized for green procurement and tracking public sector performance. (Salazar Cota et al., 2018)

To overcome these barriers to action, some of the critical factors needed for implementing successful green procurement reforms include:

- **Conducting market research.** This is important for determining whether there are sufficient suppliers to meet operational needs, and to assess the potential benefits of green procurement and the costs (both pecuniary and environmental) of not acting.

- **Having political support and leadership.** It is important for senior officials in Ministries of Finance and other key line ministries to gain the support of ministers for procurement reform.
- **Creating awareness.** It is important to promote widely in local and national media the opportunities that green procurement generates for various suppliers, especially among SMEs.
- **Training.** Training is needed particularly on the legal and technical aspects of implementing green procurement such as lifecycle costing for public goods and works, the sustainable use of products, and different procurement approaches such as e-catalogs, frameworks and joint procurement.
- **Monitoring and evaluation.** M&E systems to measure results are needed to track progress and identify areas for improvement. (See for example, World Bank, 2021b)

Methodologies and tools that can be drawn on by Ministries of Finance and that are useful for decision-makers include the Public Expenditure and Financial Accountability (PEFA) framework for assessing climate-responsive public financial management (PFM), and the sustainability module of the OECD's Methodology for the Assessment of Public Procurement Systems (MAPS). The World Bank has recently produced a more detailed guide to green public procurement, with a review of green reforms in country procurement systems across a range of countries (World Bank, 2021b).

Real world examples

A growing number of countries are recognizing the importance of incorporating green procurement into their policies, although these vary in stringency. Almost all **OECD** countries have developed strategies or policies to support green public procurement (OECD, 2021a). There is also significant progress underway in **Latin America and the Caribbean**. In a recent study, 20 of the 23 countries surveyed within the region had a public procurement regulatory framework that facilitates the implementation of sustainable public procurement. Public procurement legislation that includes sustainable procurement measures was recently enacted in Grenada, Jamaica, and Trinidad and Tobago (Eguino and Delgado, 2023). In Costa Rica, Article 29 of the Law for the Integral Management of Waste authorizes public procurers to promote the purchase and use of materials and products with little or no environmental footprint.

Opportunities for action

Ministries of Finance should consider options for strengthening measures for sustainable or green procurement, in particular:

- Establishing a legal and policy framework for green public procurement to assist procuring entities to incorporate climate objectives into their procurement procedures.
- Developing a green procurement strategy, linked to national development and climate plans, including targets and indicators to measure progress.
- Undertaking market studies to understand the potential supply of sustainable or green products, including ways to strengthen private sector innovation.
- Introducing environmental standards in technical specifications, procurement selection and award criteria, and in contract performance clauses and deliverables.
- Designing a training plan for all actors and sectors involved in state procurement, including both the public and private sectors.
- Producing a communications strategy and awareness-raising campaigns on the benefits of green procurement, to gain political, private sector and civil society support.
- Supporting studies that provide empirical evidence on the cost–benefits of green procurement; the savings and potential fiscal impact of green procurement; and the relationship between green procurement and the strengthening of local enterprises and innovation.

Function 3. Financing the transition through reforming the financial system and instruments to raise finance at speed and scale

Helsinki Principle 5

Function 3 explains how Ministries of Finance can draw on all forms of finance—public and private, domestic and international—and all instruments to raise, steer and blend sources of finance to drive climate action.

It covers: mobilizing domestic revenue to finance investment (Function 3a); greening publicly backed financial institutions and central banks (3b); accessing private capital to finance the transition (3c); providing disaster risk finance and insurance for all (3d); and leveraging international climate finance and reforming the global financial architecture (3e).

Introduction: Financing a big investment push

Having identified investment needs and put in place supportive policies, Ministries of Finance will have to focus on complementary measures to mobilize finance at the speed and scale required. Most of the investment will be frontloaded, long-term and capital-intensive for sustainable infrastructure in energy, buildings and transportation. In many countries these investments will need to take place in the context of underdeveloped financial sectors and revenue models, which feature a lack of investment-grade assets, a high cost of capital, short tenors in local currency and weak financial safety nets (Bhattacharya et al., 2022). Many sustainable infrastructure investments face market and non-market failures that lead to an undersupply of private capital for investment.

Ministries of Finance will need to draw on all main sources of capital to finance investment needs: public and private, domestic and international, with the percentages of each varying by country and by investment category (Songwe et al., 2022). The private sector can supply the bulk of the financing in some countries while in others, public and international financing will play a greater role (see also Function 1c). Ministries will need to ensure financing sources match the spending purpose, maturity required and local context when developing green financing strategies (see e.g. World Bank, 2023a).

Ministries of Finance will need to work at three levels to leverage new sources of finance for investment: upstream, midstream and downstream (Lankes, 2021). They will need to overcome market and non-market barriers to private finance 'upstream' through creating stability in climate policies and regulations (covered also in Function 1). They will need to work 'midstream' by identifying pipelines of bankable projects in partnership with the private sector (covered in Function 2). And they will need to work 'downstream' by using new financial instruments to connect private capital and funds with investments with appropriate risk–return profiles, drawing on the capabilities of the public sector. This latter point is largely the focus of this section.

The role of Finance Minister goes beyond just mobilizing finance for climate investments: it extends to a leadership role in transforming the financial system itself. Ministries of Finance typically play a major role in redirecting capital and supervising and regulating the financial sector, are often major shareholders in publicly backed financial institutions, play an important part in determining the remit of central banks, and act as major stakeholders in the global financial architecture. Hence, they will need to play a major role in aligning public finance flows and in supporting the alignment of all financial flows with Article 2.1(c) of the Paris Agreement (i.e. with adaptation and mitigation goals) and with Goal D of the Kunming-Montreal Global Biodiversity Framework (i.e. with biodiversity goals). The tools outlined in this section can play a key part in this endeavor. Measures to mobilize new sources of finance for green investment and to green finance are covered together in the relevant sections below.

Function 3a. Mobilizing domestic revenue to finance investment

In this subsection we address:

i. Broadening the tax base for capital investment in sustainable infrastructure
ii. Debt financing for investment in sustainable infrastructure, including through sovereign green and other thematic bonds
iii. Enhancing sub-sovereign finance to support fast growing cities and towns

i) Broadening the tax base for capital investment in sustainable infrastructure

Context and role of Ministries of Finance

For most countries, the overall tax system will be the bedrock for unlocking public financing to support net zero and climate-resilient infrastructure. The transition to net zero can provide Ministries of Finance with an impetus to explore new ways to broaden the tax base for these purposes. Among low-income countries the average proportion of GDP collected in tax revenue is 15%; the corresponding figure for emerging market economies is around 20% and for advanced economies it is upwards of 25% (Benedek et al., 2021; Gaspar et al., 2019). It should be an aspiration for most Ministries of Finance in emerging markets and developing countries to increase tax revenues by 3–7 percentage points of GDP in the medium term (Benedek et al., 2021).

While tax reform led by Ministries of Finance is often unpopular, a range of alternative forms of taxation can be explored to enhance fiscal space. Many of the options were mentioned in Function 3 above. They include new forms of carbon and environmental taxation, motoring taxes, road pricing, fossil fuel subsidy reforms and property and land taxation tied to sustainable infrastructure improvements; reforming general forms of taxation such as income tax and VAT; and exploring new revenue sources such as financial transactions, wealth or possible new digital services. The renewable energy sector may also become a new source of revenue over time once in its consolidation phase. Exploring these options will require creativity and innovation by Ministries of Finance.

Another option is for Ministries of Finance to explore avenues for increasing tax collection and encourage compliance. The operational strength of tax administration agencies is positively associated with tax collection (Chang et al., 2020), as are measures to foster greater international cooperation on tax base erosion.

Barriers to action and ways to overcome them

Tax increases are generally unpopular, so Ministries of Finance typically make efforts to minimize changes in the tax rate over time, preferring to let growth expand the tax base and generate revenues for servicing debt. However, for investments that yield significant medium- to long-term growth dividends, there may be a need for Ministries of Finance to consider tax increases to recoup some of the initial public sector outlay.

There are many effective strategies that can assist Ministries of Finance to overcome the barriers to shifting the tax base toward new forms of taxation. Understanding the political economy of tax reform and following the principles of progressive and socially just tax reform will be fundamental to success. Some of these strategies are outlined under this Function and under Function 3b.

In the short term, it may prove easier for Ministries of Finance to expand their potential for tax collection and to reduce tax erosion, evasion and avoidance. The operational strength of tax administration agencies and greater international cooperation on base erosion is positively associated with tax collection. Ways Finance Ministries can do this include:

- Enhancing compliance of VAT, often an especially effective strategy (Gupta and Plant, 2019).
- Considering ways to better tax the digital economy and stem illicit financial flows—including measures to tackle tax evasion, corruption and illegal activities.
- Engaging with the Inclusive Framework on Base Erosion and Profit Shifting (BEPS), an initiative coordinated by the OECD and G20 to build global consensus on multinational corporation taxation and a global minimum corporate tax. BEPS practices currently cost countries $100–240 billion per year (OECD, 2015b).
- Engaging with the Global Forum on Transparency and Exchange of Information for Tax Purposes, which promotes enhanced cooperation between tax authorities to help better capture tax revenue from money shifted abroad.

Other steps can be taken to improve tax collection but they are beyond the scope of this report.

Real world examples

A growing number of countries are broadening their revenue bases for investment in the new economy through introducing new forms of taxation. These are mainly outlined in other parts of this report, including in Function 2b, but in addition **Rwanda** is a powerful example of a country creating new fiscal space for investment in sustainable infrastructure through reforms to tax collection:

- The **Rwanda** Revenue Authority (under the purview of the Ministry of Finance and Economic Planning) committed to building a new social contract by convincing citizens to pay their full tax liabilities in exchange for improved government services. It overhauled tax collection procedures, improved information management and launched a major public education campaign. As a result of its efforts, between 1998 and 2017 Rwanda's total tax revenues increased by a factor of 10, the number of registered taxpayers grew by a factor of 13, and tax revenues as a share of total revenues rose from 10.8 to 16.7%. By 2017, 62% of the country's annual budget was financed from domestic tax revenues, up from 39% in 2000, showing recognition that the political economy of taxation was crucial to long-term success (Coalition for Urban Transitions, 2019). Rwanda is now at the forefront of countries across Sub-Saharan Africa investing in the green economy and at COP27 it launched several initiatives, among them Ireme Invest, a $104 million green investment facility to improve private sector access to green finance (Rwanda Ministry of Environment, 2022).

ii) Debt financing for investment in sustainable infrastructure, including through sovereign green and other thematic bonds[39]

Context and role of Ministries of Finance

Debt financing for investment is another option that Ministries of Finance can explore. Sovereign debt accounts for half of the $100 trillion global debt market.[40] When deployed in the context of a robust debt management strategy, sovereign debt can act as a key source of capital for investment in the net zero, climate-resilient transition (Harrison and Muething, 2021). Sovereign bonds are an especially useful conduit for Ministries of Finance to raise long-dated funding, which is particularly well-suited to sustainable infrastructure investments and adaptation investments. Cooperation with debt management offices (DMOs) is especially important here.

One rapidly growing category of debt is thematic bonds, especially sovereign green bonds. These can bring multiple additional benefits to Ministries of Finance over their traditional equivalents, including pricing benefits, reputational benefits and visibility. Green bonds attract a wider investor base than traditional ('plain vanilla') bonds.

[39] This section draws heavily on a contribution from Vangelis Papakonstantinou (CBI), and for Peru's experience Aaron Drayer (GGGI).
[40] Bloomberg 14 July 2022. Outstanding debt with a maturity greater than or equal to one year.

This can lead to tighter primary market pricing, also known as a 'greenium', which means green bonds can offer issuers lower borrowing costs. Green bonds are also surprisingly quick to bring to the market: Climate Bonds found most issuers were able to bring the bond to market in less than a year (Harrison and Muething, 2021). Recent research suggests that while green bonds are typically more expensive in the secondary market, initial concerns over possible yield curve fragmentation have not materialized (ibid.).

Green bond issuance can help to send a strong signal of government commitment to net zero, increasing investor confidence in climate policies. As well as providing reputational and visibility benefits it also helps to motivate climate action in the wider economy. Green bonds can also help to catalyze a local green bond market, which can enable local actors to access institutional investment on lower-cost borrowing than on international markets or through bank lending. They can also provide benchmark pricing and liquidity for corporate issuers, enabling them to estimate demand and pricing for their bonds, and inform the size of issuance. In 2021, the **UK** issued its debut green gilt and saw 79% growth in non-sovereign green bond issuance that same year.

In addition, to address the significant gap in adaptation finance, there are now pioneering efforts to experiment with the use of climate resilience bonds. A few of these efforts are mentioned below, although the field is embryonic and much more research into resilience bonds and their application in practice is needed to facilitate their upscaling.

Ministries of Finance should work with Debt Management Offices to carefully consider the use of debt financing in the context of a responsible debt management framework. Rising public debt-to-GDP ratios can increase a country's vulnerability to future debt crises. High public debt reduces fiscal ammunition for future countercyclical policy. If lenders begin to fear that a government may be unable to repay its debt in full, or it allows inflation to increase, then the default risk premiums and inflation premiums on government bonds may rise suddenly and sharply, exacerbating the cost of public investment. Even where debt is under control, public spending funded by borrowing at times when the economy is operating close to capacity risks crowding out private investment. Therefore, while this should not dissuade careful consideration of the use of debt financing, it is important that each Ministry of Finance considers this option in their own national context. Ministries could also investigate the possibility of debt-for-nature swaps to reduce their debt-to-GDP ratio. Introducing natural disaster clauses could also be explored. On a separate but related point, decarbonizing can reduce debt stress and fiscal resilience, by reducing debt in foreign currency related to imports of fossil fuels with volatile prices (discussions with World Bank experts).

Barriers to action and ways to overcome them

The barriers to using debt to finance are especially acute for many low- and medium-income sovereigns where debt levels were already high prior to the pandemic. According to the IMF, for several highly indebted developing countries, the debt service to tax ratio is expected to exceed 40% and about 60% of low-income developing countries are at high risk of debt distress (IMF, 2022b). In these countries liquidity in debt markets remains low and debt servicing costs can be much higher. Moreover, the relatively favorable global environment for debt servicing over the last decade may start to moderate with central banks raising interest rates to counter rising inflation in many advanced economies.

Fortunately, Ministries of Finance have some grounds for optimism in relation to the fiscal space available to investing in the transition. While domestic interest rates are rising in many countries and over-indebtedness or lack of solvency is a challenge for some Ministries of Finance, emerging evidence suggests that most countries are suffering from liquidity and roll-over problems that can be overcome with the right strategies (Songwe et al., 2022). Furthermore, although Ministries of Finance should be mindful of the risks of a higher public debt-to-GDP ratio, if public debt is used for green and resilient investment, there is reasonable evidence to suggest that it is unlikely to pose significant macroeconomic risks for at least three reasons:

1. In many advanced economies at least, **market investors are generally showing only moderate signs of concern on debt sustainability.** Perceptions of debt are different to the past due to relatively low interest rates by historic standards, depressed levels of real activity relative to potential, and excess private sector savings in the context of a cumulative shortfall of infrastructure spending.
2. **Many green investments tend to be self-financing.** This is because they do well on key growth-based criteria, can be implemented quickly, are labor-intensive, and generate high growth multipliers (Hepburn, O'Callaghan, et al., 2020). More generally, the evidence suggests that with growth depressed across many major markets, expansionary fiscal policy is likely to be largely self-financing and premature austerity a drag on growth (Stern and Zenghelis, 2021).
3. **Investment in resilience can significantly reduce the threat of sovereign default.** The first major work in this area, covering 116 countries over 1995–2007, found that investing in climate change resilience significantly reduces the probability of sovereign debt default (Cevik and Jalles, 2020). This is especially the case for low-income countries and it opens up opportunities for using debt-for-climate swaps with international creditors to mobilize resources for investments in climate action while reducing the debt burden.

Given the above, Ministries of Finance should carefully consider the use of debt financing for investment within the context of a detailed assessment of the impact of investments on short- and longer-term debt sustainability. The recent report of the High-Level Advisory Group on Sustainable and Inclusive Recovery and Growth makes a number of recommendations for reforming common fiscal rules, including to better reflect the contribution of sustainable investment to public finances' long-term sustainability (World Bank, 2023). It also makes recommendations for improving implementation of the G20's Common Framework for Debt Treatment.

Ministries of Finance considering the use of green and other thematic bonds have a range of strategies that can help them to overcome the most common barriers to issuance. The Climate Bonds Initiative's *Sovereign Green, Social, and Sustainability Bond Survey 2021* revealed that issuers tend to find the benefits of issuance outweigh the challenges (Harrison and Muething, 2021). Particularly salient challenges and strategies to overcome them include:

- **Identifying a pipeline of eligible expenditure.** Ministries of Finance can be hesitant to issue green bonds due to perceptions of there being a lack of a green project pipeline, an issue addressed in Function 2. However, the experience of most sovereign issuers is that eligible expenditures are too large for a single bond. In preparation for its €8.5 billion debut green bond, Italy identified €44.8 billion of eligible expenditure, for example. This gives room to choose only the greenest expenditure.
- **Ringfencing use of proceeds**. The defining characteristic of green bonds is that use of proceeds (UoP) are earmarked for a limited set of activities. Ministries of Finance can struggle with ringfencing UoP as many countries' public financing frameworks prevent the earmarking of revenues for specific uses. Ministries can follow **Ireland's** example and employ notional equivalence—a form of hypothecation that seeks to draw a line between proceeds and how they are used without an actual physical separation from general-use proceeds.
- **The perception that green expenditure is at odds with development expenditure.** The evidence suggests strong synergies between the two, as outlined in Part A of this report. If this barrier is especially strong, sovereign issuers can communicate this by issuing a sustainability bond that combines green and social expenditures.
- **Challenges accessing international markets.** Low-income countries and emerging market issuers may face difficulty in accessing international markets due to low credit scores. However, credit enhancement (such as from development banks) can bring their bonds' credit rating in line with investors' needs. For example, the World Bank's support of the 2018 $15 million **Seychelles** blue bond included a partial credit guarantee of $5 million and arranging concessions from the Global Environment Facility, which lowered the cost of issuance to save the country $8 million in interest payments over 10 years.
- **Ability to increase government debt.** Ministries of Finance may be unwilling to issue more government

debt and may be concerned about further increasing their debt-to-GDP ratio and associated risks. They could consider restructuring their existing debt as a sustainability linked bond (SLB) to allow them to bring clear accountability and transparency to their country's progress toward the achievement of its NDC, without increasing their debt-to-GDP ratio. Ministries of Finance can also investigate the possibility of debt-for-nature swaps (see below), to reduce their debt-to-GDP ratio, while meeting their climate goals. Ministries should be mindful that if debt is used for growth-enhancing investments, this is likely to moderate impacts on debt-to-GDP ratios.

- **Capacity-building and cost of issuance**. Ministries of Finance may be unwilling to issue a green bond due to associated additional costs and resources compared with traditional bond issuance. However, most Ministries of Finance do not find the cost to be higher when comparing yields like-for-like and any costs are diminished with repeat issuance. Consultancy firms can assist with framework writing, although this does increase the upfront cost of issuance. Low-income and emerging market sovereigns can often access technical assistance from MDBs.

Real world examples

There are now many successful instances of successful green and other thematic bond issuances.

Between December 2016 and September 2022, more than 40 sovereigns issued green bonds, 18 of which were from low- and middle-income countries (World Bank, 2022e). For example:

- **Poland** was the first country, in 2016, to issue sovereign green bonds on the international market. Funds obtained from the issue are used to finance investments that have a positive impact on the environment, including clean transportation, support for renewable energy production or afforestation, sustainable agriculture, national parks, and reclamation of spoil heaps. Since 2016, Poland has carried out four bond issues for a total amount of €3.75 billion.
- **Fiji** used around 90% of the proceeds from its 2017 green bond for adaptation. UoP included reconstruction of schools damaged by 2016's Tropical Cyclone Winston, improving agricultural resilience to drought and flooding, and adaptation research.
- **Thailand's** TBH50 billion ($1.6 billion) sustainability bond funded the construction of an electrified rail line for the Bangkok metro (THB30 billion) and social projects.
- **Italy's** sovereign green bond received EU-funded technical support from a group led by the consultancy ICF and Climate Bonds Initiative to assist with designing the framework, identifying eligible expenditure, and compiling a list of second party opinion-providers.
- **France** has issued a green bond since 2017 and in 2022 the amount totaled €51.4 billion. An evaluation council composed of eight independent experts defines the terms of reference and the programming of the environmental impact assessment reports of eligible green expenditure.
- **Chile** is the first sovereign to have issued bonds combining green, social and sustainability labels. In March 2022 it issued a world-first sovereign sustainability-linked bond (SLB). The $2 billion issuance used the KPIs recommended in the World Bank's report on KPIs for sovereign SLBs. The KPIs target an emission reduction of 15.4%, peaking emissions by 2030, and 60% renewable energy installed capacity by 2032. These KPIs are attached to a coupon step up of 6.25 basis points and 12.5 basis points from 2030/2032. In October 2022, Uruguay also started issuing sustainability-linked bonds.
- **Peru's** 2021 Sustainability Bond issuance is the largest-ever Sustainability Bond from Latin America and the Caribbean. The $3.25 billion bond proceeds will provide resources to fuel Peru's economic recovery from the COVID-19 pandemic and help build a green economy, with support from the UK and GGGI.

- **Mexico** has issued seven SDG-related bonds: four in international markets and three in the domestic market. In 2019, the Secretariat of the Treasury and Public Credit published its Sovereign Bond Framework—the world's first—which includes program eligibility and geospatial criteria to ensure that funds are directed to the regions of Mexico that need to make the most progress on the SDGs.
- The **Seychelles** were the first country, in 2018, to launch a blue bond, designed to support sustainable marine and fisheries projects.
- The **European Bank for Reconstruction and Development (EBRD)** successfully launched the first ever dedicated climate resilience bond in 2019, raising $700 million. BNP Paribas, Goldman Sachs, and SEB Group acted as bookrunners and this saw demand from around 40 investors in 15 countries. This has been used to finance the EBRD's existing and new climate resilience projects in client countries.
- In **Indonesia**, climate budget tagging helped the Ministry of Finance to develop the 'Green Sukuk' (Government of Indonesia, 2018). This sharia-compliant bond has been issued annually since 2018 to finance climate change mitigation and adaptation projects, with the government raising $3.25 in the latest issuance (Reuters, 2022).
- The **State of California** is also drawing up plans to launch a resilience bond for drought preparation and wildfire prevention.
- The **Singapore** Green Bond Framework is an important component of Singapore's sustainability strategy and a key part of its public sector initiatives to achieve its net zero ambitions. The framework establishes guidelines for green bond issuance by the Singapore government and its Statutory Boards, to ensure their public sector green bonds adhere to market best practice. The Singapore government announced that the public sector would take the lead by issuing up to S$35 billion (US$26 billion) of green bonds by 2030. Proceeds will be used to finance long-term green infrastructure that provides inter-generational benefits. Singapore's Ministry of Finance and the Monetary Authority of Singapore (MAS) published the framework in June 2022, and the inaugural S$2.4 billion (US$1.8 billion) Singapore sovereign green bond was issued in August 2022. With a tenor of 50 years, it was the longest-tenor green bond issued by a sovereign as of March 2023. The Ministry of Finance sought early buy-in from various ministries to support the development of the framework, coordinating with public agencies and industry partners. The Ministry has set up a Green Bond Steering Committee (GBSC) of senior government representatives from various ministries and agencies to guide key decisions related to green bonds issued under the framework.

A sovereign can increase visibility of its bond by obtaining Climate Bonds Certification. This is seen as the gold standard for green bonds by investors and certifies alignment with the goals of the Paris Agreement. The Climate Bonds Initiative has certified the sovereign green bonds of Chile, the Netherlands and Nigeria, and the green component of Thailand's sustainability bond.

There are examples of many countries using debt to finance investment in the zero carbon, climate-resilient transition. For example, the EU temporarily suspended the fiscal rules set out in the Stability and Growth Pact, which capped the public deficit to under 3% and debt to under 60% of GDP (or sufficiently declining to this reference value), which many countries currently exceed due to the economic crisis. The initial objective of the suspension was to adequately respond fiscally to the negative impact of the COVID-19 pandemic and thus also avoid risking a reduction in public investment for the green transition. The EU extended the suspension of fiscal rules until the end of 2023 to support countries that face additional economic challenges in light of the Russian invasion of Ukraine to assist those most impacted by rising energy prices. EU member states are currently discussing a reform of the EU economic governance framework aimed at ensuring fiscal sustainability and at enabling the green and digital transition toward a resilient economy.

Several countries are also considering debt-for-climate and debt-for-nature swaps. These are a type of debt swap in which the debtor nation, instead of continuing to make external debt payments in a foreign currency,

makes payments in local currency to finance climate projects domestically on agreed terms. **Belize** made a debt-for-nature swap in 2021, buying back its debt at a significant discount in exchange for increasing marine conservation efforts. This reduced its external debt by 10% of GDP and was financed by a blue bond insured by the US International Development Finance Corporation (Owen, 2022). Nature-focused debt swaps have taken place in several countries, for example Bolivia, Ecuador, Indonesia and the Seychelles, since the 1980s (IIED, 2021).

iii) Enhancing sub-sovereign finance to support fast growing cities and towns[41]

Context and role of Ministries of Finance

Cities and towns are growing at an unprecedented rate: by 2050, two-thirds of the global population will live in urban areas (UN DESA, 2018). Creating clean, compact and connected cities could play a major role in generating sustainable growth, improving air quality and public health, reducing poverty and avoiding the problems caused by urban sprawl, all while reducing carbon emissions (Coalition for Urban Transitions, 2019, 2021). However, the shortfall in sustainable urban infrastructure financing globally currently exceeds $1 trillion a year (ibid.).

While climate action by cities is often seen as the purview of local governments, they often do not have sufficient own source revenues to invest at scale in sustainable infrastructure. Furthermore, many cities do not have the mandate to generate or encourage generation of electricity. Cities and subnational governments rely heavily on inter-governmental grant transfers, especially outside capital cities. In 2019, the share of grants and subsidies from national government as a share of subnational government revenue ranged from 60% in low-income countries, to nearly half of revenues in high-income countries (OECD/UCLG, 2019). In some countries such as Tanzania and Peru, the share is over 80% although local governments in federal countries collect a much higher share of public revenues than unitary countries (Coalition for Urban Transitions, 2019).

Ministries of Finance can play a major role in raising resources to help fill the investment shortfall and crowd in private sector capabilities for sustainable urban infrastructure, working hand-in-hand with other agencies and local government. Four key entry points are especially important:

1. **Land-based financing instruments** can harness the interrelationships between more productive use of land and rising land values to unlock financing for sustainable urban infrastructure such as mass transit systems. Land value capture (LVC) is a powerful suite of instruments for funding large urban transport and development projects. Improvements in transportation infrastructure lead to increased land and property values nearby, which can be used as a source of revenue. Specific fiscal instruments include betterment levies, taxing incremental financing, and impact fees or development charges.
2. **Property taxes** can be designed or reformed using flat rate or beneficial property taxes to grow the tax base and incentivize more compact, connected and coordinated urban development (ibid.). In developing countries, the average property tax collection is less than 1% of GDP. In many African countries it is often much less than 0.5% of GDP. By contrast, in high-income countries property tax is often worth more than 2% of GDP (Coalition for Urban Transitions, 2019).
3. **Municipal green bonds** can help to raise upfront capital to finance sustainable urban infrastructure. As a prerequisite to debt financing, cities need sufficient sources of finance for making repayments along with capacity for budgetary, accounting and financial management. Alternatively, in the absence of fiscal decentralization, Ministries of Finance and Urban Development can collaborate with cities to identify investment priorities and structure national bond issues to support them.
4. **Public–private partnerships (PPPs)** can secure private sector capabilities in the design, construction and management of large sustainable infrastructure projects. PPPs are contracts that allocate risks between

[41] The Finance Workstream and peer-reviewed papers of the Coalition of Urban Transitions provide more comprehensive overviews of the issue areas and examples outlined in this section. See Coalition for Urban Transitions (2019, 2021); Floater et al. (2017a, b); Ahmad et al. (2019).

public and private entities, and often play a role where governments face technical and financial constraints. PPPs are particularly important in middle- and high-income countries with mature financial systems, as the effectiveness of PPPs depends heavily on appropriate project identification, structuring, contractual arrangements and government capacity (Coalition for Urban Transitions, 2019). There are many forms of PPP, but their potential is typically limited to projects that involve commercial returns on revenue-generating assets. Energy and transportation infrastructure projects have attracted the vast majority of global PPP finance.

Barriers to action and ways to overcome them

Ministries of Finance need to play a strong role in overcoming several barriers to scaling up domestic financing for sustainable urban infrastructure (Floater et al., 2017a; Ahmad et al., 2019). The opportunities for land-based financing, for example, are typically significant in countries where urban population and economic growth is taking place, creating demand for transportation infrastructure and the resulting increase in land values near transportation nodes. However, in many countries, regulatory frameworks and robust land and property markets can be weak. To move forward is therefore likely to require sustained efforts by Ministries of Finance with Ministries of Housing, Planning and Land to create reliable, transparent and fair land records and valuation structures, and effective regulatory frameworks for land-based financing. Ministries of Finance can also work with municipalities to identify projects best suited to land-value capture. Examples of good practice include **Brazil's** Status of the City 2001 and **Colombia's** Law 388 of 1997, which both explicitly authorise and enable the use of land value capture by municipal governments.

Alternative 'recurrent' models to property taxes based on a simple flat-rate tax linked to occupancy, property size and location could be introduced. This could be advantageous as property taxes, while often economically efficient, predictable and progressive, can also be politically and technically difficult to administer. Ministries of Finance can also work with other agencies to build capacity for more efficient property markets by systematizing valuation practices, registration and titling, and introducing transparent transaction registries.

Unlocking the market for municipal green bonds can be challenging without clear frameworks for enforcing the overall debt limit across levels of government and for sub-national governments to increase own-source revenues to pay for their liabilities. Solid legal frameworks outlining borrowing rights and conditions could be introduced, to instil confidence in lenders and capital markets. This could be complemented by measures to enhance the creditworthiness of sub-national governments. **France** and **Mexico**, for example, require municipalities to generate standardized balance sheets. Ministries of Finance can also work with other agencies to trial national-to-local loan programs or other measures to build local government credit history and experience.

Institutional and contractual arrangements underpinning PPPs are critical to realizing their potential benefits while minimizing the risks. The selection and design of a PPP contract can be complex, requiring agencies with experience in the operational, legal and regulatory arrangements, and they create liabilities that are often not fully recorded on balance sheets. Further, if contracts are poorly designed, they may face high administrative costs or private partners enjoying excessive, windfall profits. **South Africa** has introduced standard criteria and methodologies for appraising, procuring and disclosing public–private partnerships. Dedicated PPP units could be established to provide skills to different levels and sectors of government. The PPP Center of the **Philippines** provides technical assistance in contracting, implementing, monitoring and evaluating PPPs (Ahmad et al., 2019).

Cutting across these tools and instruments, Ministries of Finance can also work with other agencies to support detailed feasibility studies and project planning for major sustainable urban infrastructure projects. They can support subnational governments to access international development assistance and climate finance. A few

international finance institutions, such as the **European Bank for Reconstruction and Development** and its Green Cities Programme, have well-developed lines of lending to municipal authorities and utilities, working closely with Ministries of Finance. They can also create national urban infrastructure funds within existing national development banks or support cities to standardize and aggregate small investments through blended finance mechanisms.

Implementing these types of measures may require a degree of broader fiscal reform. The World Bank has recently produced detailed guidance on adapting fiscal decentralization design to combat climate change, which can be a useful resource for Ministries of Finance (Martinez-Vasquez, 2021).

Real world examples

There are many examples of Ministries of Finance and central government supporting local governments to transform finance for cities for better economic and climate outcomes. These include:

- The **UK Treasury** in its 2021 Spending Review committed an unprecedented investment package of £5.7 billion ($7.1 billion) for eight English city-regions to transform local transportation networks through London-style integrated settlements. In the capital the Greater London Authority and Transport for London worked with the government to use land-based financing to fund the £18 billion Crossrail project. It did this through a Business Rate Supplement—a nationally entrusted local variance in the application of business rates, which complements individual user fares (Coalition for Urban Transitions, 2019).
- In **Uganda**, local governments can struggle to collect property tax efficiently and this source accounts for only 0.1% of total revenue. To address the problem, the Kampala Capital City Authority worked with others to implement a system for online payment of business licenses, hotel taxes, ground rents, property rates and other charges. These efforts dramatically improved tax administration and collection, enabling the city to triple its own-source revenue in three years and achieve a long-term credit rating in domestic markets (Delbridge et al., 2022).
- In 2014, **Johannesburg** became the first Sub-Saharan African city to issue a green bond. The 10-year, 10.18% note raised more than $125 million for investments in renewable energy, landfill methane capture and hybrid-fuel buses (C40, 2015). This bond was enabled by a legal framework that limits municipalities to long-term borrowing for capital expenditure and clarifies that no higher levels of government will guarantee the debt (Ahmad et al., 2019).
- In 2016, **Mexico City** became the first Latin American city to issue a green bond. The five-year note was oversubscribed 2.5 times and raised MXP2 billion ($50 million) for investments in potable water, wastewater, energy-efficient public lighting, and public transport (C40, 2017).
- Also in **Mexico**, 247 PPP projects have reached financial closure since 1990. Over $8.2 billion is currently actively invested in PPPs, and $67.6 billion has been mobilized in the past 25 years for nationally significant infrastructure (Ahmad et al., 2019).
- The **Hyderabad** metro in India was developed through a public–private partnership based on land value capture. The main revenue sources are fare revenues and property development. This is complemented by a viability gap fund to fill finance gaps if needed (ibid.). The Devolved Climate Finance (DCF) Alliance encourages greater flows of climate finance to cities and regions.

Opportunities for action

Ministries of Finance should identify new sources of tax revenue to drive investment for the net zero, climate-resilient transition. They should follow the principles of progressive and socially just tax reform and consider the potential trade-offs and synergies between economic, social and climate objectives. They should also give attention to strengthening tax collection.

Ministries of Finance should consider using public debt to support a green and resilient investment strategy, providing it is within a responsible macroprudential framework and considered alongside efficient use of existing national fiscal space. To ensure debt sustainability while investing in the needed transformation, Ministries of Finance should consider:

- **Having clear and predictable fiscal rules with room to invest in green and resilient infrastructure.** Possibilities include adopting a rule to balance the current budget over a medium-term cycle while allowing some flexibility for policymakers to borrow for investment.
- **Avoiding placing artificial ceilings on debt service costs as a percentage of total government expenditure or GDP** without taking adequate account of the contribution of investment in green and resilient infrastructure to the country's 'net worth' through the generation of future revenues. Such investment will require broader and more flexible forms of public-sector balance sheet accounting.
- **Working in partnership with central banks** to ensure that fiscal and monetary policy work together to coordinate the appropriate maturity and term structure of public debt that central banks purchase, and to steer funds toward the growth of productive sectors.
- **In emerging markets and low-income countries, exploring the use of debt-for-climate swaps** with international creditors to create additional fiscal headroom.
- **Joining new networks such as the Sustainable Debt Coalition**, launched at COP27 to support emerging markets and developing countries to increase access to affordable green finance and to facilitate refinancing of existing debt or issuance of new debt, aligned with climate key performance indicators.

As part of their debt management strategy, Ministries of Finance should explore the greater use of green and other thematic bonds in partnership with relevant line ministries and debt management offices. Governments considering the use of green bonds should pay attention to clearly defining investment priorities, tagging projects for financing or issuance, impact reporting, and investing in software to integrate bond framework criteria into the public investment system for project designers in line ministries. Further research should be supported to look at how to scale up climate-resilient bonds.

Ministries of Finance should also work closely with sub-national governments to enhance access to sustainable sources of finance for investment in sustainable urban infrastructure, especially given the impacts of COVID-19 on the use of public transportation systems. Options might include reforms to land and property taxes, and reforming national regulations to allow local borrowing with sufficient fiduciary oversight.

> **Ministries of Finance should identify new sources of tax revenue to drive investment for the transition, following the principles of progressive and socially just tax reform and considering trade-offs and synergies between economic, social and climate objectives.**

Function 3b. Greening publicly backed financial institutions and central banks

In this subsection we address:

i. Greening national development banks and green investment banks
ii. Greening sovereign wealth funds and state-owned enterprises
iii. Greening central banks and fiscal and monetary policy coordination

i) Greening national development banks and green investment banks

Context and role of Ministries of Finance

With more than 250 national development banks (NDBs) globally, with assets in excess of $5 trillion, it is crucial for Ministries of Finance to support them to manage climate risks and invest in the new economy (Studart and Gallagher, 2016). NDBs usually play a central role in shaping national economies and financial systems, crowding in private lenders and investors by taking on risk. Ministries of Finance are often major shareholders in NDBs through the budget process and can help shape their strategies at the board level. Around 10 NDBs operating in China, Germany, Brazil, India and South Africa account for $2.9 trillion or almost 60% of those assets. In Latin America alone there are 72 active NDBs, spanning 19 countries through a network of 78,850 branches and able to reach a population of close to 1 billion people (Delgado et al., 2021).

In countries without NDBs, Ministries of Finance can create public green investment banks (GIBs) and GIB-like entities. These are public entities established specifically to facilitate private investment into low-carbon, climate-resilient infrastructure. The creation of a GIB can send a signal to the market and other countries that a country or region is seeking to become a leader in scaling up private low-carbon investments (OECD, 2016).

Both NDBs and green investment banks can work with a range of investors to overcome the barriers to private finance. The types of co-investors they target will vary based on the types of market gaps and barriers being addressed, and on whether they are pursuing a 'wholesale' or 'retail' strategy. Both NDBs and GIBs are designed to overcome specific barriers to private sector investment. They do this by deploying a range of instruments, including:

- **Loan loss reserves**, in which capital is set aside to cover potential losses from borrower defaults.
- **Guarantees**, a credit enhancement tool used to mitigate perceived or actual risks.
- Insurance, another credit enhancement tool used to protect investments against a range of risks such as construction, operational and market risks.
- **Debt subordination**, in which particular classes of lender are given priority to attract financing from this source.
- **Securitization**, a technique whereby small-scale assets such as cash flows from solar leases or power-purchase agreements are transformed into a standardized, tradable asset.
- **Co-investing**, a form of project-level investing whereby investors lacking sufficient scale or expertise partner with other specialized and expert investors to invest in a project.
- **On-bill financing**, which allows borrowers to repay clean energy or energy efficiency loans through an additional charge on their existing utility bill.
- **Leasing**, which enables customers to make use of certain assets such as rooftop solar PV systems without purchasing them, thereby lowering costs and overcoming investment barriers.

National export credit and trade finance agencies, and export–import banks often play a key role in providing finance for exporters, in addition to NDBs and GIBs. Similarly, Ministries of Finance can play a role in reforming their mandates to drive climate action.

Barriers to action and ways to overcome them

Ministries of Finance can face strong resistance to increasing the role of NDBs or establishing GIBs to tackle the climate crisis. This could arise from the economic case for action not being well understood by Ministers or senior officials, or concerns about competition with central government initiatives, how to fund NDBs, and systemic impact.

All of these concerns are surmountable, given that:

- It should be relatively straightforward for Ministries of Finance to assemble evidence on the economic case as studies show that NDBs and GIBs typically have strong performance track records. They usually have public–private leverage ratios of between 2 and 3, generate strong rates of return, help to create new jobs, and generate emission reductions (see e.g. OECD, 2016). They tend to be good at overcoming barriers to infrastructure investment, building confidence in new technologies, and drawing in local professional finance expertise. They can also play a market transformation role and reduce financing costs by sharing expertise and demonstrating that investments are profitable.
- NDBs and GIBs can complement central government leadership by being more flexible and familiar with markets and private companies.
- Ministries of Finance can explore a wide range of funding sources for NDBs, including general budgets, carbon tax revenues, ETS revenues, utility surcharges, loans, bond issuances, or funding from MDBs and Regional Development Banks.

Furthermore, it is usually in the interests of NDBs to collaborate with Ministries of Finance on this journey to help them manage their own risks and exposure, ensure they fulfill their mandate of supporting their governments, and can gain access to a wider range of funding sources.

Real world examples

Some NDBs have been providing financing for low-carbon, climate-resilient projects for many years:

- **Germany's** KfW has been investing in environmental protection domestically and internationally since the 1980s.
- The **French** development agency (AFD) finances low-carbon and climate-resilient projects, with 58% of its activities co-benefiting climate and €6 billion dedicated to climate in developing countries in 2021 (AFD, n.d.).
- The **Colombian** Bank for External Commerce, Bancoldex, recently prepared a program to finance innovative, low-carbon public transportation technologies in Bogota. This led to new investment worth over $80 million with mixed sources of finance in over 300 hybrid and electric buses.
- The **EU's** lending arm, the European Investment Bank Group (EIB), in its Climate Bank Roadmap committed to "increas[ing] the share of its financing dedicated to climate action and environmental sustainability to exceed 50% of its operations in 2025 and beyond" and engaged in mobilizing €1 trillion of investments for that purpose over 2021–2030 (EIB Group, 2020). It also developed a Green Eligibility Checker to support financial intermediaries in assessing the compliance of investment projects.

GIBs and GIB-like entities have been established in many countries at the national level (Australia, Japan, Malaysia, Switzerland, UK), the state level (in the US: California, Connecticut, Hawaii, New Jersey, New York), the county-level (Montgomery County, US) and the city-level (Masdar, UAE) with a high degree of success (OECD, 2016).

There are also emerging initiatives to green export credit and trade finance:

- The **Dutch** Ministry of Finance has decreed that businesses and banks will no longer be eligible for export credit insurance for new projects in the fossil energy sector unless these are in line with 1.5 degrees.
- Others include the forthcoming Net Zero Export Credit Alliance (NZECA) that will be hosted by UNEP Finance Initiative (UNEP FI); and multilateral initiatives such as the Berne Union Climate Working Group (BU CWG) looking at how to reform export credit and trade finance.

There are some emerging global efforts to develop a public finance commitment framework for public financial institutions, modeled on quasi-commitment frameworks for private finance such as GFANZ.

ii) Greening sovereign wealth funds[42] and state-owned enterprises

Context and role of Ministries of Finance

Ministries of Finance can play a major strategic role in pushing for investment in a low-carbon, climate-resilient future by sovereign wealth funds (SWFs) and state-owned enterprises (SOEs), as they are often major shareholders in these and other publicly backed institutions:

- SWFs typically function either as separate legal entities under law with legal identities and full capacity to act, as state-owned corporations, or in some cases as a pool of assets owned by the state or the central bank without a separate legal identity (Al-Hassan et al., 2013). Their mandates are typically set by the Ministry of Finance, either via the central bank (e.g. Norway) or as a separate fund management entity owned by the government. In some cases, the Ministry of Finance gives mandates directly to external (private) fund managers to manage the assets (ibid.).
- For SOEs, Ministries of Finance often act either in the main coordinating role on the government's policy on SOEs or support this function alongside owning line ministries or centralized agencies. The Ministries of Finance in Denmark, Germany, and Japan, for example, act as the main public shareholders in SOEs (OECD, 2022a). Many Ministers of Finance have a role in board appointments and many SOEs have mandatory financial and non-financial reporting requirements to Ministries of Finance.

There is great potential to drive transformative progress on climate in both SWFs and SOEs. Of the 128 sovereign funds across 68 countries that collectively manage $9.3 trillion of assets, only 30% have a target to reduce emissions across their investments (Kyriakopoulou et al., 2021). Over 70% of oil and gas production assets and 60% of coal mines and plants globally are state owned (IEA, 2020; OECD, 2021c). A recent study shows that the state-owned sector is responsible for at least 7.49 $GtCO_2e$ annually in direct emissions, which is significantly higher than the emission levels of every country in the world bar China (Benoit et al., 2022).

Many Ministries of Finance are therefore in a position to play a major strategic role in agreeing company-wide strategies for low-carbon, climate-resilient investments and there are powerful incentives to prioritize this. Without SOEs and SWFs taking comprehensive action, investment opportunities and first mover advantages in the net zero transition will be reduced. As big investors they can lead by example and positively shape markets, including by investing in high-impact big-ticket projects. For example, in 2016, Vattenfall, **Sweden's** state-owned multinational power company, sold its coal assets, citing commitment to sustainable energy. And governments can leverage the expertise, skills and capacity of SWFs and SOEs as high-caliber investment professionals employed by the state (Kyriakopoulou, 2020).

[42] This section draws on a contribution from Danae Kyriakopoulou (Grantham Research Institute, LSE).

There are financial risks, too, in SWFs that are heavily dependent on fossil fuel revenues. They can hedge their risks and de-link their performance from fossil fuel price volatility by aligning their portfolios with climate objectives. In doing so, SWFs would begin following industry best practice as exemplified by the Glasgow Financial Alliance for Net Zero (GFANZ), which launched at COP26 in November 2021, and includes over 450 member institutions collectively representing over $130 trillion in assets. SWFs are typically established as savings vehicles for future generations. Safeguarding the environment on which those generations will depend therefore lies at the heart of their missions.

Moreover, countries' climate commitments are typically related to emissions originating domestically, and do not cover emissions resulting from the foreign asset holdings of SWFs. This has meant that SWF investments have not yet been typically considered within governments' climate objectives and strategies. This is a missed opportunity, especially for economies such as those of Norway or the Gulf states, whose SWF assets are much larger than their domestic GDP.

Barriers to action and ways to overcome them

There are several barriers to Ministries of Finance playing this more strategic role, which can be overcome with the right strategies. Typical barriers include:

- Shared ownership or governance structures with other line ministries, and the presence of other minority shareholders with different priorities.
- Poor understanding of the climate risks to their organizations and of the opportunities for investing in the new economy on behalf of SWF and SOE senior leadership teams and board members.
- Resistance to changing business practices by SWF and SOE employees and other stakeholders.
- Lack of resources, whether financial or technical capacity, to measure and manage their portfolios' exposure to climate-related risks and identify investment opportunities.
- Lack of appropriate staff incentive structures to deliver strong climate performance.

The most important tool Ministries of Finance have is their power to redefine the mandates of SWFs and SOEs, in favor of reducing carbon emissions and increasing resilience. The process of making adjustments to explicitly include this objective often will need to be done collaboratively with other shareholders, given shared ownership structures. Other tools that can be deployed include:

- **Disclosures:** instructing SWFs and SOEs to follow the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), and the Taskforce on Nature-related Financial Disclosures (TNFD).[43]
  The Treasury of **New Zealand** provides an example, having mandated the Crown Finance Institutions including the country's SWF to provide transparent TCFD-aligned reporting.
- **Budget support:** provisions to cover the costs of analyzing portfolios' carbon footprints as well as to invest in capability, governance and new skills at board level and across management and staff.
- **Creating incentives:** establishing incentive structures for management that recognize the importance of climate objectives or mandate the funds' boards to do so.
- **Education and training:** for board members, management and staff on climate risk management and sustainable investment. The One Planet Sovereign Wealth Fund Group was established at the One Planet Summit in 2017 as a network for SWFs to foster a shared understanding of principles, methodologies and indicators related to climate change, for example.
- **Sustainable investment guidelines:** along with direction and incentives for SWFs and SOEs to adopt them, provided by Ministries of Finance (see **Norway** example below).

[43] Building on the TCFD recommendations, the International Financial Reporting Standards (IFRS) S1 and S2 will become effective in January 2024. This first set of global sustainability standards builds on the TCFD to provide a global baseline for consistent and comparable climate-related disclosure and can be used as a basis for disclosure mandates.

Real world examples

A growing number of SWFs and SOEs are reimagining their strategies, some with support from Ministries of Finance (see also OECD, 2021). For example:

- **Norway's** Government Pension Fund Global (GPFG) is the world's largest SWF. With assets of over $1.2 trillion, its size is three times that of Norway's economy, and the carbon emissions of its equity portfolio are around twice Norway's total annual emissions (Halland and Thallinger, 2021). In a 2022 White Paper the Ministry of Finance stated that "the Government wants to make the GPFG world leading in responsible investment and the management of climate and nature risks." So far, the Ministry has adopted Guidelines for Observation and Exclusion of Companies for the GPFG, featuring both product-based exclusions (e.g. coal) and conduct-based exclusion criteria (e.g. severe environmental damage). The Ministry also appointed an external expert group to assess the significance of financial climate risk and climate-related investment opportunities, which resulted in a report in 2021 recommending that the Ministry aligns the GPFG's mandate with the Paris Agreement. Despite these efforts, the GPFG has been subject to criticism from the international economics community for not doing enough and has been called on to join the Net-Zero Asset Owner Alliance (ibid.).
- **Italy's** Cassa Depositi e Prestiti (CDP) published its Green, Social and Sustainability Bond Framework in 2021, to strengthen its ability to promote sustainable development in line with the mandate received by its biggest shareholder, the Italian Ministry of Economy and Finance. The fund has set up a dedicated Sustainability Department to develop and implement the strategy. Among SWFs, CDP is considered a pioneer when it comes to sustainability and social bond issuance (Kyriakopoulou et al., 2020). It issued its first sustainability bond in 2018, a €500m 'Hydro' Bond to promote the development and modernization of the Italian water supply network, and has since issued several follow-up green bonds.
- The **New Zealand** Superannuation Fund (NZSF) is one of the few funds with an explicit emission-reduction objective. In October 2021, ahead of COP26, the New Zealand Treasury issued a new investment framework to align investment decisions by the Crown Financial Institutions (which includes the NZSF) to reflect the government's carbon neutrality goal for 2050. This followed a decision by the Cabinet that all Crown Financial Institutions with more than $1 billion in assets should provide transparent reporting consistent with the TCFD recommendations. The NZSF also provides an instructive case study of the potential financial gains from following a low-carbon strategy. Between 2017 and 2020, the Fund's low-carbon benchmark portfolio (which comprises 40% of its total assets) generated returns that were 0.6% higher than its standard benchmark portfolio (Halland and Lopez, 2021).
- In **Abu Dhabi**, Masdar, a subsidiary of the Mubadala fund, was established in 2006 with the mission to make sustainability solutions, primarily renewable energy and clean technologies, commercially viable. The fund has invested both domestically and abroad. Domestically, its mission has been to facilitate the transition of Abu Dhabi away from fossil fuels and toward renewables, and to promote sustainable development, including the planning of the eco-sustainable 'Masdar City'. The fund has also invested abroad including in solar plants and sustainable infrastructure across Africa, the Mediterranean, the Middle East and beyond.
- **Finland's** state ownership policy requires SOEs to take into account the objective of achieving carbon neutrality nationally by 2035. Similar measures exist in **Germany** and **Ireland**.
- In **Singapore**, the Government expects its investment entities like GIC and Temasek to integrate sustainability considerations into their investment processes in a way that best suits their mandates to deliver sustainable returns over the long term and preserves their reputation with global partners and markets.
- In **Sweden** and **Norway**, ownership entities hold regular discussions with supervisory boards of SOEs.

In some countries it will be appropriate for Ministries of Finance to play a role in engaging with ISO national standards bodies in developing climate-aligned standards (e.g. the new sustainable finance standard (ISO 322), noting the ISO climate commitment to revise all international standards in line with climate science and leveraging the ISO Net Zero Guidelines as a core document. They can also support efforts such as the forthcoming Race to Regulation initiative.

iii) Greening central banks and fiscal and monetary policy coordination[44]

Context and role of Ministries of Finance

Central banks are powerful institutions that can significantly increase their support to governments' commitments to the goals of the Paris Agreement, if their mandates allow (Dikau and Volz, 2021). Central banks began embracing the climate action agenda between the global financial crisis and the COVID-19 crisis. However, their roles to date largely have been limited to protecting the financial sector from climate-related risks, which has enabled them to avoid criticism of 'mission creep' (OMFIF/Mazars, 2020). Protecting the financial sector from climate-related risks is important and links well to most central banks' primary objective of price stability but they can go much further than this: by doing more to encourage investment in the new economy, including by working closely with Ministries of Finance. Currently they are impeded not by a lack of useful instruments, but by an unclear mission.

Central banks face several types of physical and transition risk:

- **Risks to macroeconomic variables.** Physical and transition risks (i.e. from climate shocks and climate policies) can affect key macroeconomic variables relevant for central bank decision-making, including output, consumption, investment, productivity, employment, wages, international trade, exchange rates, inflation and inflation expectations.
- **Risks to transmission of monetary policy.** Climate change may affect the balance sheets of financial intermediaries, asset valuations and the expectations of economic agents. Risks in the form of stranded assets, increased credit risks and shifts in expectations among economic agents may all impair the transmission of monetary policy.
- **Risks to balance sheets.** Climate change could increase the riskiness of assets held on central banks' balance sheets, potentially leading to financial losses. (Boneva et al., 2021; NGFS, 2020, 2021b)

Given these risks, central banks may need to consider a range of options to mainstream climate change into their monetary policy frameworks. These include exploring ways to incorporate climate variables into their macroeconomic modeling, adjusting eligibility criteria for lending facilities to consider climate-related risks in counterparties, adjusting screening of the range of assets that can be pledged as collateral to secure central bank credit operations, and considering climate-related externalities in asset purchases. A step further could involve excluding some assets or issuers from purchases if they fail to meet climate-related criteria.

Central banks may also need to consider a range of options to integrate climate change into their prudential supervision frameworks. In many jurisdictions central banks act as the prudential supervisor and have a mandate of safeguarding financial stability. In its first progress report in 2018 the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) acknowledged that "climate-related risks are a source of financial risk" and that "it is therefore within the mandates of Central Banks and Supervisors to ensure the financial system is resilient to these risks" (NGFS, 2018).[45] It may be necessary, therefore, to require financial institutions to disclose their exposure to climate-related risks in line with the TCFD, stress testing the potential losses, adjust capital (Dikau et al., 2022) requirements with a 'green supporting factor' or 'brown penalizing factor', or require mandatory transition plans. Central banks should also consider integrating *nature* risks into their activities. Although this could be challenging due to the complex dynamics of the natural world, some banks are already conducting risk exposure assessments (Coalition of Finance Ministers for Climate Action, 2022a).

[44] This section draws on a contribution from Danae Kyriakopoulou and Simon Dikau (Grantham Research Institute, LSE).

[45] In April 2015, G20 Finance Ministers tasked the Financial Stability Board with reviewing how the financial sector can take account of climate-related issues, leading to the establishment of the Taskforce on Climate-related Financial Disclosures (TCFD) under the FSB chairmanship of Bank of England Governor Mark Carney in December that year. Mark Carney's 'Breaking the tragedy of the horizon' speech highlighted the links between climate change and financial stability (Carney, 2015) ahead of the signing of the Paris Agreement at COP21. The Network of Central Banks and Supervisors for Greening the Financial System (NGFS) was subsequently created at the One Planet Summit in Paris in December 2017, initially with eight members, growing to around 60 members at the start of the COVID-19 pandemic and to over 110 members at the time of writing.

Ministries of Finance can enable central banks to resolve tensions in their remit related to climate action. Monetary policy is usually the purview of central banks and is typically guided by the objective of price stability, with many central banks having explicit inflation targets. However, central banks are also prudential supervisors and managers of investment portfolios such as foreign exchange reserves, pension portfolios and own funds. This opens up a wide range of options for leadership.

Ministries of Finance can play a particularly important role in encouraging central banks to leverage their reserves for sustainable investment. Central banks usually manage sizeable reserve portfolios and their collective assets under management amount to over $15 trillion globally (Kyriakopoulou et al., 2021), including foreign exchange reserves, own funds, pension portfolios, and third-party portfolios. Ministries of Finance should be encouraged, to the extent that their mandates allow, to develop investment strategies, which are typically guided by the objectives of liquidity, safety and return, to include objectives related to the zero-carbon, climate-resilient transition; develop sustainability criteria and embed them in investment analysis; introduce positive and negative climate performance criteria for investments; invest directly in sustainable assets such as green bonds; and use sustainability criteria to select and appraise external managers, including engaging in active ownership strategies.

Strong coordination between Ministries of Finance and central banks on fiscal and monetary policy is critical. For example, in the absence of coordination, a sudden imposition of climate policies such as carbon pricing creates financial instability through sudden devaluation of stranded assets, causing a so-called 'climate Minsky moment' (Breeden, 2022). Similarly, policy by Ministries of Finance such as carbon pricing or fossil fuel subsidy reforms will directly impact inflation and financial asset valuations. Coordination can also avoid central banks becoming the 'only game in town' where they are expected to make up for insufficient action on climate by Ministries of Finance. Relying too much on central banks such as with an expectation that they engage in 'green quantitative easing' in order to solve the complex socioeconomic problems related to the low-carbon transition may create moral hazard, distort markets further and create disincentives (Bolton et al., 2020).

Barriers to action and ways to overcome them

While central banks are powerful institutions, well-equipped to support the transition to net zero, they face barriers in doing so: in particular because they are 'policy-takers' from national government as well as 'policymakers'. They widely acknowledge that the primary responsibility of addressing climate change lies with governments (Lagarde, 2021; Schnabel, 2021). For those central banks with a secondary mandate to support the economic policies of their governments (which applies to around 40% of central banks [Dikau and Volz, 2021], their capacity to act in many cases depends on remit letters from Ministries of Finance. These set out how far the government's priorities are relevant for the central bank.

The most important tool that Ministries of Finance have is their power to explicitly set out and update central banks' responsibilities and remits to bring them in line with their government's net zero commitments. The UK experience provides an instructive case of the decisive impact Ministry of Finance action can have (see below), and recent work demonstrates just how significant the global opportunity remains: a recent study of 135 central banks showed that only 12% have an explicit sustainability mandate (Dikau and Volz, 2021). Delayed action by governments may even result in central banks having to act as 'climate rescuers of last resort' in the face of green swan events that expose the financial system to a large set of devalued assets (Bolton et al., 2020).

Beyond explicit direction on mandates, Ministries of Finance have other tools at their disposal to overcome the barriers to action. These include:

- **Considering climate expertise in central bank senior appointments,** although this is not without contention. Central bank senior appointments usually follow a governmental process, with the Governor appointed directly

by the Head of State in around 60% of cases, and by the parliament, wider government or Minister of Finance in the rest (BIS, 2009).

- **Introducing investment objectives for reserve-management.** Some central banks manage portfolios on behalf of the Ministry of Finance, such as in Japan and to some extent the US.
- **Encouraging sovereign green bond issuance.** Central banks are often constrained in terms of what assets they are allowed to invest in, with over 65% of their portfolio allocated to government bonds (Kyriakopoulou et al., 2021). There is significant scope for Ministries of Finance and Debt Management Offices to expand efforts on this, working closely with central banks.

Real world examples

- In the **UK**, the Bank of England (BoE) takes forward work related to climate change consistent with its primary objectives of monetary and financial stability, and HM Treasury sends annual 'Remit and Recommendation' letters to the BoE's three policy committees—the Monetary Policy Committee (MPC), Prudential Regulation Committee (PRC) and Financial Stability Committee (FPC). These letters articulate the parts of the government's economic strategy that the committees should have regard to. The most recent letters (from 2022) state that the government's economic strategy embeds "delivering Net Zero" along with increasing long-term energy security within the context of a government policy focused on supply-side reforms. The PRC and FPC letters also detail factors relevant to climate change and the net zero transition the committees should consider in executing their respective functions. The FPC is reminded that climate change is relevant to its primary objective of promoting financial stability and its secondary objective of supporting the government's economic policy, while the PRC should support the government's ambition to encourage economic growth in the interests of consumers and businesses, including the provision of sustainable finance. There are also legislative proposals before the UK Parliament to introduce a regulatory principle for the PRC "to have regard to … the need to contribute toward achieving compliance with [the UK's Net Zero target]."
- In the **EU**, the European Central Bank (ECB) provides a more complex and challenging example, but also demonstrates how these challenges may be overcome. The ECB's mandate is first to maintain price stability, and second to support the general economic priorities in the Union. Through this secondary mandate the ECB pursues action that supports the EU's climate neutrality targets, in three key areas: managing climate-related risks, supporting the green transition, and wider action. These objectives are achieved in accordance with the market neutrality principle, which posits, for example, that corporate bond purchases should be made in a 'neutral' way, reflecting the overall eligible market to ensure they do not distort the relative pricing of securities. The shortcomings of the market neutrality principle are now being highlighted, with considerable debate related to 'green' eligibility criteria for its collateral and asset purchase eligibility framework (e.g. Jourdan and del Vasto, 2021).
- The **NDC Partnership Readiness Support for Greening Central Banks** is a mechanism to provide hands-on support to central banks and financial supervisors in developing countries. To date, 13 central banks are being supported by the initiative.

Ministries of Finance can enable central banks to resolve tensions in their remit related to climate action.

Opportunities for action

Ministries of Finance should look for opportunities to leverage their shareholder positions in state-owned entities and their relationship with central banks to drive climate action and investment. They should work with relevant line ministries to green national development banks, export credit agencies, sovereign wealth funds and state-owned enterprises by reviewing and revising their mandates, engaging with boards and minority shareholders, and providing effective management incentives and awareness- and capacity-building activities. This should include the creation of a climate policy, identification of strategic sectors, revisions to risk assessment procedures, stress tests, and reforms to reporting processes.

They should also consider:

- Using NDBs as the fiduciary agent for the attraction and management of international climate finance.
- Ensuring carbon pricing regimes are applicable to both SOEs and private companies.
- Developing strategies to ensure that SOEs are not unduly advantaged or disadvantaged in the transition where private firms coexist.
- Joining multilateral initiatives to green export and trade finance such as the Berne Union Climate Working Group (BU CWG) and Net Zero Export Credit Alliance (NZECA).

Where NDBs do not exist, Ministries of Finance should consider setting up dedicated green investment banks (GIBs). Before proceeding, they could carefully consider the costs of establishing a GIB, the bank's level of independence, its mandate and culture, financing approaches, and level of investment risk.

Ministries of Finance should consider explicitly setting out and updating central banks' remits and responsibilities to bring them in line with governments' climate commitments. Beyond explicit direction on remits, Ministries of Finance can consider climate expertise in central bank senior appointments, introduce investment objectives for reserve-management, and encourage sovereign green bond issuance.

Function 3c. Accessing deep pockets of private capital to finance the transition

In this subsection we address:

i. Greening the financial sector and financing green
ii. Driving innovations in financing models, including blended finance
iii. Bringing sources of finance together in sustainable finance roadmaps

i) Greening the financial sector and financing green[46]

Context and role of Ministries of Finance

Ministries of Finance will need to work hand in hand with the domestic and global financial sector to access the capital required to finance the transition to a post-carbon economy. $130 trillion of private capital through members of the Glasgow Financial Alliance for Net Zero (GFANZ), for example, is now committed to aligning activities with net zero and is increasingly being targeted at Paris-aligned lending and investments (CPI, 2022). A similar approach is being taken with long-term investment horizons and liabilities as part of the UN-convened Net Zero Asset Owner Alliance. Unlocking this private finance to drive the transition is particularly important. In the context of the investment opportunity, greening the financial system—or financing green investment—refers to increasing the availability and deployment of financing flows from financial institutions into sectors that contribute to climate and environmental objectives (building on World Bank, 2021c). This includes from:

- The banking sector
- Pension funds
- Private equity
- Investment schemes (securities and hedge funds)
- Capital markets
- Insurance markets

Greening pensions is a particularly pertinent issue as 'green pensions' are becoming increasingly attractive to pension holders. The landscape of potentially competitive green investments is growing and emerging research suggests greening pensions is likely to be one of the single most effective actions individuals can take to reduce their carbon footprint (see OECD, various). While this issue is not addressed in detail here, Ministries of Finance can help to ensure that adequate, investment-grade deals at scale come to the market for pension funds to invest in through a range of mechanisms (see for instance Hyrske and Kyriakopoulou, 2022).

Ministries of Finance will need to play an important role, with others, in ensuring the resilience of the financial system. Climate change is a source of financial instability due to the physical risks and the risks stemming from the transition to net zero, which will be particularly great if the transition is 'disorderly'(see NGFS, 2022) . While the issue of systemic financial sector risk should be and is a central concern of central banks, regulators and supervisors, this agenda should be an equal concern for Ministries of Finance, given their priorities of maintaining growth and a stable macroeconomic environment. Their engagement on this agenda is critical for at least two reasons: they often set central bank and regulator mandates (as laid out above); and they are usually forced to play the central role in responding to financial crises. Some Ministries of Finance have explicit financial stability mandates and/or play a leading role in Financial Stability Committees. The interconnection between climate action and maintaining financial stability is only likely to grow; failing on one implies failing on the other (Dafermos et al., 2018).

[46] This section draws on Coalition of Finance Ministers for Climate Action (2021a).

Physical and transition risks can materialize into financial risk, impacting the financial sector through:

- **Credit risk.** Climate-related risks induce, through direct or indirect exposure, a deterioration in borrowers' ability to repay their debts to lenders.
- **Market risk.** Under an abrupt transition scenario (e.g. with significant stranded assets in carbon-intensive sectors), financial assets lose their market value which leads to fire sales, which could trigger a financial crisis.
- **Liquidity risk.** Banks' balance sheets that are hit by credit and market risks could lead to banks being unable to refinance themselves.
- **Insurance risk.** For the insurance and reinsurance sectors, there are higher than expected insurance claim pay-outs due to physical risks.
- **Operational risk.** Financial institutions can be affected through the direct exposure of their own operations to climate-related risks. (Coalition of Finance Ministers for Climate Action, 2021a)

One issue that is often given insufficient attention is how to build the capacity of domestic capital markets to fund investment in the net zero, climate-resilient transition. Capital markets, composed of primary and secondary markets for debt (bonds) and equity (stocks)[47] can facilitate the flow of capital from those with surplus savings to those in need of capital—typically, firms and governments. Capital markets can complement traditional bank finance, and there is some evidence that carbon-intensive industries reduce emissions more rapidly in economies with well-developed stock markets that are able to fund high-risk innovation activities needed for the green transformation (De Haas and Popov, 2023; Aghion et al., 2022). Capital markets are increasingly adapting to reflect the growing demand of investors for non-financial information on the issuers of securities to determine whether securities are sustainable and which investments may be exposed to climate risks (OECD, 2022f; Ehlers et al., 2021). Empirical evidence suggests that investors already consider physical climate and transition risks in the pricing of equities (Bua et al., 2022).

Barriers to action and ways to overcome them

Few Ministries of Finance, central banks or financial sector firms have a sufficient understanding of the systemic risks and investment opportunities for the financial system. As a result of the complexity and far-reaching, non-linear nature of the risks, they often find integrating climate-related risk analysis into financial stability monitoring challenging (Bolton et al., 2020). Exceeding climate tipping points, for example, could lead to catastrophic and irreversible impacts that would make quantifying financial damages impossible—which in turn could lead to a so-called 'green swan' event and cause a systemic financial crisis (ibid.); this underscores the need to address resilience and mitigation concurrently. Identifying strong investment and market opportunities can be equally challenging in the presence of dynamic cost curves for new zero-carbon technologies and uncertain longer-term policy.

The common use of backward-looking risk assessment models that extrapolate historical trends prevents full appreciation of future systemic risks and real investment opportunities, contributing to this challenge (Bolton et al., 2020). Moreover, the financial sector suffers from low awareness of sustainable finance, an unwillingness to invest in climate-related projects due to real or perceived risks, the absence of commonly agreed standards to help assess commitments, and untapped business opportunities. The challenges are especially acute in emerging markets and developing countries where functioning capital markets are yet to be established, precluding the issuance of sophisticated green financial instruments and creation of complex disclosure regimes. That said, there are some promising signs of change. For example, the share of the fossil fuel energy sector in the US S&P 500 index was 13% a decade ago but had fallen to around 3% in 2020 (IRENA, 2021b) and the main rating agencies now consider the financial impacts of climate change in their rating processes (FSB-TCFD, 2021).

[47] For a schematic overview see Juko (2019).

However, more work is needed and Ministries of Finance should work with line ministries, central banks, regulators, supervisors and stock exchanges to address these shortcomings. They can do so by:

- **Identifying and assessing the main climate-related risks and investment opportunities for the financial sector**, including transition and physical risks, drawing on relevant analytics.
- **Developing Green Finance Roadmaps for the financial sector** to ensure investments identified in national development and climate strategies can attract private finance while maintaining financial sector competitiveness. Ideally, these should be linked to broader Sustainable or Green Finance Roadmaps, as outlined below. This is likely to involve:
  - Identifying relevant stakeholders for the development of the roadmap
  - Carrying out a gap analysis of the main shortcomings in the financial system in meeting climate objectives and responding to the identified risks and opportunities
  - Identifying the key barriers to implementing the roadmap
  - Identifying actions the financial sector can take to address gaps and overcome barriers
  - Assessing how resources can be made available to implement the roadmap
  - Publishing and promoting the roadmap to signal policy commitment and enable investor certainty
- **Encouraging financial institutions to take concrete action to align their businesses, portfolios and strategies with net zero pathways and climate objectives.** This might involve awareness-raising events, encouraging financial institutions to join international initiatives related to the Paris Agreement or SDGs, and requiring formal net zero transition plans to be developed that contain financial and other commitments.
- **Working to support the central bank, regulators and supervisors to develop a robust supervisory response to address climate-related risk.** This might include systematic use of financial stability councils or committees to assess the impacts of climate action on the stability of the financial system and regulatory reform to help private actors manage climate-related risks. This can include scenario analysis, disclosure requirements aligned with the TCFD, and, to encourage disclosure on nature-related risks, the TNFD.
- **Considering developing a green taxonomy.** This is a classification system to identify environmentally sustainable economic activities that contribute to climate goals (see Ehlers et al., 2021, for some principles for these taxonomies). Such efforts should be accompanied by encouraging investors and companies to develop long-term transition strategies and reforms to their business models.
- **Considering measures to strengthen the emergence of green local capital markets.** Ministries of Finance can pave the way for private green bond issuances through sovereign green bond issuance, as above. They can also create policy environments conducive to risk-taking in the sphere of green innovation such as by allowing full tax deductibility of capital losses from current and future profits by venture capital firms, or requiring institutional investors such as pension funds and insurance firms to direct small parts of their financial firepower to equity portfolios that support green innovation (OECD, 2022f).

These efforts can have important impacts. A recent empirical study to measure the effects of climate-related financial policies on carbon emissions in G20 countries from 2000 to 2017, for example, shows that countries adopting a climate-related financial policy see a statistically significant negative impact on carbon emissions in both the short and long terms (D'Orazio and Dirks, 2022).

Ministries of Finance will need to work hand in hand with the domestic and global financial sector to access the capital required to finance the transition to a post-carbon economy.

Real world examples

More and more private financial institutions are committing to aligning their activities with net zero. As of mid-2022, according to analysis by CPI, at least 547 financial institutions representing $129 trillion in assets under management and advice had announced net zero targets (Solomon, 2022). These institutions (which include asset managers, asset owners, commercial banks and insurers) represent 32% of global private financial assets, approximately 65% of the global asset management industry, and 39% of the global banking industry. This includes 25 of the 30 largest global asset managers and 39 of the 60 largest banks in the world (ibid.).

More broadly, inside and outside the financial sector, some Ministries of Finance are supporting or requiring private sector organizations to develop net zero transition plans. For example, in the **UK,** the Transition Plan Taskforce has a two-year mandate from HM Treasury to provide financial institutions and companies with the tools they need to create rigorous transition plans to fulfill their net zero commitments. Similarly, the **EU** recently agreed a disclosure regime for financial products. The Sustainable Finance Disclosures Regulation requires banks and financial service providers to report on sustainability and climate risks from 2023. However, there is more work to be done in the private sector: more than 4,000 (out of 18,600) companies assessed in 2022 in 135 countries disclosed they had a climate transition plan, but only 81 (0.4%) demonstrated best practice by disclosing against 21 key indicators that denote a credible climate transition plan (CDP, 2023).

An increasing number of countries are developing green finance roadmaps for the financial sector with the active leadership of Ministries of Finance. They include Australia's Sustainable Finance Institute, the UK's Green Finance Strategy (2019), Norway's Roadmap for green competitiveness in the financial sector (2018), Indonesia's Sustainable Finance Roadmap Phase II (2021–2025), and South Africa's Assessment of financing a sustainable economy (2020). There are also examples of some countries looking to develop green financial centers (see Box B10).

Other prominent initiatives include:

- The **Netherlands** national climate and energy plan (NCEP) included, in July 2019, a commitment by the financial sector to mandatory measurement and reporting of emissions. More than 50 institutions with combined assets of over €3 trillion signed up to this commitment and must publish action plans that outline how they will contribute to a decrease in CO_2 emissions. Financial institutions will also exchange knowledge and best practice on methodologies and actions to align portfolios with net-zero. The financial sector aims to make climate methodologies more comparable with each other and to work toward further harmonization.
- **France** has undertaken a similar exercise. In July 2019 financial institutions in Paris committed to the Minister of the Economy and Finance to publish individual coal-exit strategies, which mean that by 2030 most French financial institutions will no longer finance coal in the EU or OECD, and from 2040 onwards in the rest of the world.
- **Indonesia's** green taxonomy, unveiled in January 2022, brought together more than 47 financial service institutions including commercial and Islamic banks, capital markets, issuers, securities companies, and investment managers into a Sustainable Finance Task Force. This task force is intended to jointly formulate policy and facilitate capacity-building for private financial institutions. Though the green taxonomy at this point is mainly used as voluntary guidance, the Ministry of Finance plans to make it standard for determining activities and formulating national initiatives including the decarbonization of state-owned enterprises. There is also discussion of expanding it into mandatory disclosures of taxonomy-relevant investment portfolios from the private sector. The taxonomy will be the basis for a carbon exchange regulatory framework that Indonesia plans to develop.
- **Luxembourg's** efforts to be among the world's top green financial sectors include the Sustainable Finance Initiative, through which it is innovating and consolidating its sustainable finance activities in line with the

national sustainable finance strategy, an outcome of the 'The Luxembourg Sustainable Finance Roadmap' developed in 2018 with the UN Environment Programme Finance Initiative (UNEP FI). The initiative, launched in 2020, sets and implements the Sustainable Finance Strategy for the Luxembourg financial center. Founded in 2020 by the government (with the Ministry of Finance), Luxembourg for Finance and the independent High Council for Sustainable Development, the initiative's objective is to raise awareness of, promote and help develop sustainable finance initiatives in Luxembourg.

- **Mexico's** sustainable taxonomy, published in early 2023, follows a broad approach to sustainability, considering environmental and social aspects.
- **Poland** is combining capital market development with the strengthening of sustainable finance. The Capital Market Development Strategy (2019–2023) is the first detailed plan for Poland's national capital markets since the transition to a market economy. The strategy was prepared by the Ministry of Finance in cooperation with the EBRD and was financed by the European Commission. Its main goal is to improve access to financing for Polish companies (in particular SMEs), contributing to the long-term development of the economy, and for the Polish capital markets to become a financing hub for Central Europe's companies and start-ups. The strategy also sets several sustainable finance measures, including building dialogue through working groups, educational campaigns, promoting environmentally-friendly finance and developing sustainable products such as green bonds or indices. The Ministry of Finance has initiated work on a roadmap for the development of sustainable finance and established the Polish Sustainable Finance Platform as a forum for dialogue. The project aims to leverage development opportunities for the Polish capital market created by the transformation of the European economy toward climate neutrality; increase the participation of private investors in financing the transition; and support other countries in the CEE region in attracting private investment for their climate transition.
- The **G20's** transition finance framework outlines actions that countries (and financial institutions) can consider across five pillars: the identification of transition activities and investments, reporting of information on these activities and investments, developing transition-related finance instruments, designing policy measures, and assessing and mitigating the negative social economic impacts of transition activities and investments. The **OECD** (2022g) also provides guidance on transition finance.

Box B10. Establishing green financial centers

Green financial centers are one way of helping to accelerate the expansion of sustainable finance, in the face of a growing realization that green finance has strategic implications for 100-plus financial centers around the world (FC4S, 2022; UNEP, 2018). These centers are place-specific, can generate an agglomeration or clustering effect across different sectors and institutions, and can act as nodes of innovation. The uptake of new approaches and technology is often considerably faster in financial centers than at the policy level and can help to ensure the upskilling of finance professionals, address regulatory challenges, promote effective climate policies, and support high-carbon companies that are transitioning toward net zero emissions.

UNDP Financial Centres for Sustainability's 2022 survey of the world's financial centers shows that financial centers are increasingly embracing sustainable finance (FC4S, 2022)—but key barriers remain. These include poor data quality and availability of information on ESG performance, lack of common sustainability standards, reliance on self-assessments and unverified disclosures, lack of sustainable product pipelines and financial products, and lack of capacity and qualified professionals familiar with sustainable finance.

Ministries of Finance, in partnership with central bank and financial regulators, can encourage sustainable financial centers through numerous different actions. They can set an example by issuing green financial instruments such as green loans and bonds, invest resources in harmonizing key definitions, principles and measurement, invest in secondary and tertiary education and other forms of training to increase the number of qualified sustainable finance professionals, and cooperate more closely with global networks such as the FC4S and C40 Cities Climate Leadership Group.

Source: Prepared by the authors

ii) Driving innovations in financing models, including blended finance

Context and role of Ministries of Finance

As part of wider efforts by Ministries of Finance, blended finance mechanisms and other innovations can play an important role in helping to scale-up private finance for climate action. Despite the strong commitment from the private sector to align with net zero outlined in the previous section, there remains a significant gap between commitments and financial flows globally. In particular, private finance continues to shy away from investing in emerging markets and developing countries (EMDCs), where the investment needs are largest. For example, only around $7 trillion out of the $130 trillion (less than 6%) of assets controlled by members of GFANZ is located in EMDCs (GFANZ, 2021). Sustainable investment needs tend to be frontloaded and capital-intensive and in EMDCs risks tend to be compounded by macroeconomic, currency, political risks, and a lack of certainty around government commitments, plans and policies (World Bank, 2023).

Blended finance instruments can form part of a green financing strategy and help address the risks that limit private investment flows. The 'blending' practice typically uses public capital, such as official development assistance (ODA) and funding by multilateral development banks (MDBs) and development finance institutions (DFIs), or philanthropic sources of capital, to de-risk projects designed to have a positive developmental impact in EMDCs. The employed public or philanthropic capital, by mitigating investment risks, alters the risk–return considerations of private investors, thereby drawing in additional financing that would otherwise not have been available. Blended finance initiatives thus aim to mobilize additional commercial capital for sustainable investments, to reduce financing gaps for net zero and the SDGs more generally.

While still a small part of the finance universe, blended finance is slowly becoming more mainstream. It was featured prominently in the Sharm El Sheikh Guidebook for Just Financing (Egyptian Ministry of International Cooperation, 2022) published at COP27 and highlighted as an innovative financing tool to mobilize capital for climate adaptation and mitigation investments. According to the *State of Blended Finance 2022* report by Convergence, a global blended finance network founded in the context of the 2015 Addis Ababa Action Agenda, in the last decade there have been on average 56 blended finance deals per year, yielding an average annual financing of $10.7 billion of annual financing (Convergence, 2022). However, blended finance flows were only $4.5 billion in 2020 (ibid.). MDBs and DFIs tend to invest more than bilateral development agencies in blended finance transactions. Blended finance transactions specifically targeting climate focus mostly on mitigation rather than adaptation and most climate-focused blended finance transactions (41% of deals between 2019 and 2021) target Sub-Saharan Africa (Convergence, 2022).

Blended finance is a particularly pertinent tool for EMDCs, due to the fact that macroeconomic volatility or currency risks may be more pronounced there, political and regulatory risk may be higher, and having a variety of reporting standards can make risk assessment more cumbersome (OECD, 2018b). The specific nature of these risks usually underscores the need for the involvement of development banks in blended finance transactions, as the banks possess local knowledge and institutional expertise to account for these risks, thus making them an important public counterpart to private investors in many blended finance deals.

Ministries of Finance are uniquely placed to create, shape and lead blended finance markets that can serve climate-related objectives. They can do so working in cooperation with the MDB system and other government departments, particularly Foreign Ministries and Ministries of International Cooperation and Development.

The incentives for Ministries of Finance to develop blended finance tools to mobilize private sector financing are multiple. They help accelerate climate action that protects economies from climate-related economic risks. They help reduce the pressure on domestic resource mobilization at a time of particularly challenging macroeconomic conditions. And they help create opportunities for the domestic private sector. For example, **Finland's** blended finance partnership with the International Finance Corporation (IFC) involved an element of strengthening collaboration opportunities between the IFC and Finnish stakeholders, such as increasing the visibility of procurement opportunities in IFC and World Bank projects among Finnish private sector and sector-specific industries.

Ministries of Finance can also encourage MDBs and DFIs to adopt innovative blending approaches to boost available capital. MDBs along with internationally active NDBs have unique expertise in structuring and financing (green) infrastructure projects in EMDCs and in assessing and mitigating respective project risks. The publication of aggregated credit default rates by the Global Emerging Markets Risk Database Consortium in 2021 highlighted the excellent performance of the world's preeminent DFIs, with average credit default rates in infrastructure of only 3.2% (over 2001–2019) (Global Emerging Markets Risk Database Consortium, 2021).

Promising examples highlight the benefits that innovative blending approaches by DFIs can bring. For instance, the **African Development Bank's** (AfDB) 'Room2Run' transaction, a synthetic securitization of seasoned private sector loans, made $600 million of additional lending available to renewable energy projects and created a promising new channel for private sector investment through risk exposure to AfDB's balance sheets. Fund-level blending of the French, German and Japanese DFIs as part of a climate-focused infrastructure fund by BlackRock has raised $673 million for equity investments in emerging markets (Jessop and Kerber, 2021). Given the promising results and the need to mobilize private capital at scale, Ministries of Finance should consider using their capacity as DFI shareholders to encourage the adoption of more innovative blending approaches.

Barriers to action and ways to overcome them

There is a particular need for investment in sustainable infrastructure, particularly in EMDCs (World Bank, 2023). Despite the strong case for this investment, private finance is not flowing at a large enough scale to fund the transition. Direct investments in sustainable infrastructure often require long lead times to originate and to bring to financial close. They are subject to environmental and social due diligence, land rights acquisition, and overall complex investor agreements. Lead times vary by country and have further increased during the pandemic, with projects facing delays as government attention has focused elsewhere. These issues are usually compounded by political and policy risk, including policy uncertainty (e.g. a temptation to keep energy costs low for consumers, which impacts the return on clean energy assets or creates the inability to tie successors to policies that affect long-term assets such as infrastructure), corruption, and exchange rate risk. A lack of a strong legal and regulatory framework can exacerbate these barriers and make conditions for private investment even less favorable.

For climate-related and sustainable investments, private finance faces additional barriers given the uncertainty over future demand for technologies that lack maturity. There are therefore strong incentives for investors to pilot frontier climate technologies (such as battery storage) in markets with stronger investment environments before deploying them in EMDCs, where the challenges around new technologies are compounded by further country-related risks.

These circumstances create a strong need to reduce and address the risks that private finance faces and that cannot be easily hedged or diversified directly within the market. In the absence of well-functioning markets where such risks would otherwise be mitigated or not arise in the first place, blended finance can act as a powerful way to overcome barriers and help match risk-adjusted returns to investor requirements (Lankes, 2021). Table B3 summarizes the categories of risk that may apply to climate investments, and how blended finance initiatives can help overcome them.

Tailoring blended finance to the local context can contribute to overcoming investment barriers. The OECD's Development Assistance Committee (DAC) has produced a set of blended finance principles to facilitate good practice in the blending sphere, one of which pertains to tailoring blended finance to the local context (OECD, 2020b). Closely aligning blended finance interventions with national strategies and local needs can encourage the mutually beneficial buy-in of partners in the countries where the blended finance transaction takes place. Working with local partners and building on their knowledge and expertise can help build awareness of the local context, potentially reducing barriers to local market-building (ibid.).

Table B3. Risk rationale for blended finance

Risk	Examples	Blended finance (BF) rationale
Policy risk	Unclear regulation	BF might compensate for lack of information absent regulatory track record.
Project risk	Skills/capacity	Technical assistance to compensate for lack of local talent.
Business risk	First mover	Taking risk and creating market knowledge for future market entrants goes unrewarded. BF can compensate.
Counterparty risk	Weak off-take agreement	Government failure. BF can mitigate this risk (e.g. through guarantees) but should seek alignment of government interest.
Tenor risk	Market finance too short-term	Underdeveloped local capital markets. BF can be designed to lengthen terms or mitigate refinancing risk.
Liquidity risk	Thin debt or equity markets	Underdeveloped emerging markets or green asset markets. BF can be designed to limit downside risk.
Market risk	Currency volatility	No currency hedging available. BF can step in as swap counterparty.

Source: Lankes (2021)

Real world examples

Several governments, with active involvement or leadership from Ministries of Finance, have begun to launch initiatives to mobilize capital for climate objectives through blended finance mechanisms.

- **Indonesia's** government has embraced blended finance as an opportunity to bridge the gap between investment needs and the availability of public finance. In 2009 the Ministry of Finance set up the Indonesia Infrastructure Guarantee Fund to provide government guarantees for infrastructure PPPs. The launch of the Tri Hita Karana (THK) Roadmap for Blended Finance in 2018 was a landmark step in creating an international framework for mobilizing blended finance for the SDGs. In the same year the Indonesian Ministry of Finance launched SDG Indonesia One, an integrated blended finance investment platform to support large-scale SDG-aligned projects in Indonesia. As part of this effort, the Indonesian Ministry of Finance signed an MoU with the Asian Development Bank to create the SDG Indonesia One-Green Finance Facility (SIO-GFF), the first green finance facility in Southeast Asia to support infrastructure investments with a view to achieving the Paris Agreement targets and the SDGs.
- The **EU** launched its External Investment Plan (EIP) in 2017. The initiative uses both blending (mix of EU grants with bank loans) and guarantees to attract investment from the private sector into countries neighboring the EU. The plan uses €5.4 billion in public funds to share the risk of investing in areas like small business loans and renewable energy and has generated over €54 billion in public and private investment for development. This also includes funding technical assistance from experts to help develop new projects and support governments in enacting reforms that will attract investment. Within the framework of the EIP, the EU Commission further established the European Fund for Sustainable Development (EFSD) in 2017. The tool will raise up to €135 billion worth of investments, as an innovative instrument to help generate investment through guarantee capacity and blending grants.
- **Finland** and the International Finance Corporation together launched the Blended Finance for Climate Program (BFCP) in 2017. The program seeks to use ODA resources in an innovative way to catalyze innovative investments and unlock private financing into climate-smart projects in low-income countries. By 2021, the program had committed to six projects with an expected abatement of 579,000 tonnes of CO_2 equivalent per year, including the installation of solar arrays in school rooftops in the West Bank and Gaza, which won the UN Global Climate Change Award.
- **Germany's** Ministry for Economic Cooperation and Development (BMZ) launched the Africa Agriculture and Trade Investment Fund (AATIF) in 2011, a $146 million fund that uses a first-loss layer (from the BMZ) and a 'mezzanine layer' (from Germany's development bank KfW and Deutsche Bank) to encourage private investment.
- **Luxembourg's** Ministry of Finance partnered with Schroders and its impact investment specialist BlueOrchard Finance Ltd in June 2022 to launch an impact strategy to address the funding gap in climate finance. The innovative investment strategy focuses on channeling both public and private capital to address environmental and climate goals, via a Luxembourg-based financing vehicle.

Several specialist global platforms are also emerging in the blended finance space:

- In 2016, **Canada's** Global Affairs department (Global Affairs Canada) with the World Economic Forum and other partners launched Convergence as part of the WEF/OECD Redesigning Development Finance Initiative. Convergence functions as a global deal-sourcing platform for emerging and frontier market blended finance deals, with Global Affairs Canada committing $19.17 million of catalytic funding over five years.
- Further examples include the **OECD** DAC Community of Practice on Private Finance for Sustainable Development (CoP-PFSD), a forum for exchange between donor countries and the private sector; **Tri Hita Karana**, a multi-stakeholder platform and convening space working on the improvement of blended finance in different workstreams; and the **Blended Finance Taskforce** founded by the Business & Sustainable Development Commission.

iii) Bringing sources of finance together in sustainable finance roadmaps

Context and role of Ministries of Finance

Sustainable finance roadmaps (or strategies) are a possible tool Ministries of Finance can use to organize the range of actors involved in sustainable finance around a common conception of their roles and responsibilities. Spearheaded over the last decade by the UN system (UNEP Finance Initiative) and the TCFD, these build on the idea of roadmaps for the financial sector, as outlined above. They can help prioritize actions and coordinate activities among stakeholders including policymakers, regulators, companies and financial sector participants to accelerate the expansion of sustainable finance within and outside financial systems. Sustainable finance roadmaps with a specific focus on the financial sector are a sub-set of these strategies.

More than 40 roadmaps have been drafted to date globally, in all regions of the world, according to recent analysis by the Coalition for Finance Ministers and FC4S (Coalition of Finance Ministers for Climate Action, 2021a). Most roadmaps have been drafted with input from both the public and private sectors, have a leading role for the Ministry of Finance and/or financial regulators, and include recommendations for a wide range of actors. Stakeholder participation usually involves working groups, roundtable discussions, interviews and surveys. Roadmaps for the financial sector can form part of this process.

Roadmaps usually seek to consider ways to:

- **Enhance financial market stability** through systematic use of financial stability councils or committees to assess the impacts of climate action on the stability of the financial system and of introducing regulatory reform to help private actors manage climate-related risks.
- **Encourage enhanced disclosure** of climate-related risks by private companies through adoption of internationally-recognized disclosure standards and the use of sustainable taxonomies.
- **Evaluate public sector investments** for their contributions toward reducing emissions or enhancing resilience.
- **Increase the use of green bonds** at the sovereign, sub-sovereign and corporate levels.
- **Enhance provision of training and skills development** for public, private and academic professionals, including through revamping school curricula and tertiary education.
- **Enhance product and market innovation** in the public and private sectors (including financial, insurance and pensions sectors).
- **Enhance data collection and dissemination** such as specially curated platforms for the distribution of sustainable investing research and commentary.
- **Review and reform systems of incentives and taxation** to encourage long-term sustainable investment such as reducing taxation on investments that qualify as environmentally sustainable under relevant taxonomies.
- **Enhance the use of MDB/IFI and international climate finance** for investment.

Many of these focus areas are echoed in the G20 Sustainable Finance Roadmap (G20, 2021) and follow-up activities, which seek to promote international coordination on approaches to identifying and aligning investments to sustainability goals.

More recently, there has been an increasing focus on ensuring sustainable finance roadmaps go beyond supporting green activities to cover provision of 'transition finance' to transform existing carbon emitters. The emphasis here is on providing financing and financial services to high carbon-emitting industries—such as steel, cement, chemicals and construction—to fund the transition from 'brown' to 'green' (see OECD, 2022g). However, the global ecosystem for transition finance is not yet well established; efforts are required to better define transition activities and focus on credible disclosure and reporting to avoid greenwashing.

Barriers to action and ways to overcome them

The many barriers to developing effective sustainable finance roadmaps include inadequate assessments of investment gaps in key sectors and a lack of existing coordination mechanisms. Overcoming these barriers is possible but typically will demand a strong role for the Ministry of Finance, relevant line ministries, the central bank and other regulators.

While each national roadmap must be tailored to the country context, effective sustainable finance roadmaps typically meet the following 13 criteria:

- Develop a broad consultative process
- Designate appropriate institutional leadership
- Build a strong narrative for financial system alignment with the SDGs
- Describe the requirements for aligning the financial system with the SDGs
- Include an estimate of the investment gap in low-carbon, climate-sensitive sectors
- Conduct an analysis of challenges and obstacles to scaling up sustainable finance
- Include multiple projected scenarios for the evolution of the financial system
- Develop precise and actionable recommendations
- Indicate which measures are the most urgent/feasible and prerequisites for deeper reforms
- Develop a capacity-building plan to strengthen organizational competencies
- Define monitoring arrangements, including progress indicators
- Identify the agency or institution responsible for implementing each recommendation
- Periodically evaluate the overall state of sustainable finance and renew public engagement. (Coalition of Finance Ministers for Climate Action, 2021a)

The issue of transition finance should also be considered.

Real world examples

Country sustainable finance roadmaps are intended to enable the prioritization of necessary actions to be taken by a wide range of actors—including Ministries of Finance, regulators, supervisors, corporations and financial sector participants—to successfully realign national financial systems for sustainable development.

The Coalition for Finance Ministers and FC4S have analyzed and summarized a wide range of approaches to developing roadmaps across over 40 countries, with in-depth analysis for Canada, Germany, Ireland, Japan, Luxemburg, Nigeria, Mexico and Switzerland (Coalition of Finance Ministers for Climate Action, 2021a). The analysis draws conclusions that suggest the process of developing roadmaps may serve to increase awareness by all national stakeholders of sustainable finance and can play a key role in informing future training programs and improving data availability and quality. These existing country examples can provide inspiration for Ministries of Finance wanting to develop sustainable finance roadmaps.

In **Germany**, for instance, the Ministry of Finance, with the Ministry for Environment, Nature Conservation and Nuclear Safety and the Ministry for Economic Affairs and Energy, has prepared a Sustainable Finance Strategy designed to position Germany as a leading centre for sustainable finance. The federal government appointed a Sustainable Finance Advisory Committee comprising representatives of various stakeholder groups, including financial industries, the real economy, academia and civil society, to advise on the development and implementation of the strategy. Building on recommendations from the group, the government launched the German Sustainable Finance Strategy in May 2021 (ibid.).

What is clear from existing roadmaps is that they are often quite partial in their coverage. The most commonly-made recommendations center on reporting and disclosure measures and accompanying transparency measures of firms and financial institutions. There is an opportunity for Ministries of Finance to consider the full scope of issues relevant to transforming the financial system by both public and private sector actors, many of which are outlined in this guide.

Opportunities for action

Ministries of Finance need to do more to help raise, steer and blend private finance for greater, faster investment and should consider establishing multi-stakeholder platforms or taskforces to help produce Sustainable Finance Roadmaps within and outside the financial system.

For success and impact, these roadmaps would have the following features:

- **Inclusivity:** involve the Ministry of Finance, other key government departments, the central bank, supervisors and regulators, financial sector actors, industry bodies, other private sector actors, and relevant experts.
- **Accountability:** work to develop voluntary and mandatory commitments to decarbonization and reducing systemic risk by actors in the financial system and key investors in the economy. Tracking of public finance flows could also be considered.
- **Resourcing:** be supported by a process that is adequately resourced and involves technical working groups in driving forward plans in key action areas.
- **Investment pipelines:** focus on creating strong investment pipelines and building mechanisms for sustained engagement with the private sector (see Function 2).
- **Platforms:** in high-risk contexts, they would consider establishing blended finance initiatives and country investment platforms in strategic priority areas to de-risk private investment.

- **Systemic risk:** work with central banks, regulators and supervisors to identify and address the main climate-related risks to the financial system.
- **Networks:** encourage central banks and financial sector actors to participate in international networks and standard-setting organizations to facilitate knowledge-sharing and collaboration. These include the NGFS, TCFD, Task Force on Climate-related Financial Risks (TFCR), International Financial Reporting Standards (IFRS) and many others.
- **Resilience and climate finance:** include effective approaches for disaster risk financing and mobilizing international climate finance.
- **Transition finance:** consider effective approaches for provision of transition finance for high-emitting sectors.

Function 3d. Providing disaster risk finance and insurance for all

Context and role of Ministries of Finance

The macroeconomic cost of natural disasters can significantly affect government budgets. These costs accrue from the immediate decline in GDP growth and the cumulative, permanent GDP loss during the years following a major disaster. For example, the 2011 floods in Thailand reduced government revenues in 2011 and 2012 by 3.7% and 2.6% respectively, based on pre- and post-flood projections (World Bank, 2012). The impact on exports and imports of two droughts reduced government revenues in Malawi by 9% in the fiscal year 1992/93 and by 11% in 1993/94, at which time public expenditure rose by 30%, resulting in an increase in the fiscal deficit of over 23% (Benson and Clay, 2004). Globally, it is estimated that the occurrence of at least one major climate event per year is associated with an increase in that year in the fiscal deficit of 0.8% of GDP for lower- to middle-income countries and 0.9% of GDP for the low-income group (Alejos, 2018).

Successful risk financing and insurance measures are almost always anchored in and driven by Ministries of Finance, even if financing cuts across different agendas and is often seen as belonging to specialized agencies (World Bank, 2014). In a growing number of developing countries, the Ministry of Finance has established fiscal risk management divisions tasked with the identification, quantification, disclosure and management of fiscal risks associated with natural disasters. These teams are often best placed for leading the disaster risk financing and insurance agenda, in partnership with other public entities such as the Ministry of Agriculture. Anchoring financial protection to disasters within the Ministry of Finance supports comprehensive approaches to fiscal and debt risk management and allows governments to build on existing capacity in managing other contingent liabilities such as debt.

Even where dedicated risk management teams are not in place, the Ministry of Finance is typically best placed to implement disaster risk financing and benefits the most from doing so. In such cases other units within the Ministry, for example those dealing with budget management, debt management, economic policy, or sometimes insurance divisions or insurance supervisors, can make sensible homes for the agenda.

Historically, governments have mostly addressed the financial effects of natural disasters on an ad-hoc basis. In line with the Sendai Framework for Disaster Risk Reduction they now need to focus increasingly on proactive planning *before* a disaster strikes. The use of disaster risk financing and insurance aims to increase the resilience of countries against the financial impact of disasters. It usually seeks to strengthen the financial resilience of the four different groups: national and local governments; homeowners and SMEs; farmers; and the poorest.

The respective strategies typically include some combination of:

- **Sovereign disaster risk financing** to increase the capacity of national and subnational governments to provide immediate emergency funding, long-term funding for reconstruction and development, and to account for other contingent liabilities, such as government-supported agricultural insurance or social protection schemes requiring pay-outs. Examples include contingent credit or disaster reserve funds that enable governments to secure funds in advance of a disaster to be available immediately in case of emergency.
- **Property catastrophe risk insurance** to protect homeowners and SMEs against losses arising from property damage. Examples include Catastrophe Insurance Pools, and PPPs between the government and the domestic insurance industry.
- **Agricultural insurance** to protect farmers, herders and fishermen from losses arising from damage to their productive assets. Examples include National Crop Insurance Programs.
- **Disaster-linked social protection** to help governments strengthen the resilience of the poorest and most vulnerable by applying insurance principles and tools to enable social protection programs such as social safety nets to scale up to beneficiaries immediately following disaster shocks. Examples include integrating disaster risk contingency planning and financing into the Productive Safety Net Programs (World Bank, 2014).

Barriers to action and ways to overcome them

The use of proactive financial protection instruments requires a certain level of experience in advance-planning within the Ministry of Finance and wider government, including strong public financial management experience and trained officials who can conduct complete fiscal forecasts that incorporate different disaster scenarios and carry out regular monitoring. These elements of fiscal monitoring are not found in most countries. For capabilities that do not yet exist in-house, for instance in risk modeling and disaster forecasting, Ministries of Finance can consider temporarily outsourcing to the private sector or other actors.

Adopting a proactive risk financing approach has multi-year budget implications. Multi-year forecasts for revenues, medium-term expenditure totals for mandatory expenditure, and potential debt financing need to be in place, developed in partnership with other ministries. Moreover, increasing the tax burden in the wake of an economic contraction after a disaster can be almost impossible without a well-organized system for tax policy and administration.

It is particularly challenging to support comprehensive and affordable insurance coverage of disaster risks across economies that have varying levels of insurance market development. Tax incentives, subsidies and/or various forms of compulsion often have to be considered to ensure adequate coverage, and/or insurance or reinsurance provided directly by governments. In developing countries with limited insurance penetration (or a lack of insurance culture), innovative initiatives can provide targeted coverage to vulnerable segments of society such as agricultural producers or small entrepreneurs.

Data availability and modeling capability is often a major challenge too (Eguino and Delgado, 2023). The existing international datasets recording climate-related events are often not publicly available, not available in full, or provide only a partial reporting of impacts. In addition, the reporting of total economic losses is not done following a common standard, which makes it difficult to disaggregate total losses between the private and public sectors, with consequences for the estimation of related fiscal impacts.

There are no simple answers to overcoming these challenges, but success in establishing effective mechanisms is more likely to be assured if certain strategies are used. These include:

- Strong leadership by the Ministry of Finance, given that disaster risk financing and insurance bring together disaster risk management, budget management, public finance, private sector development, social protection and coordination with other public agencies.

- Involving the private sector as an essential partner, to bring capital, technical expertise and innovative financial solutions.
- Viewing disaster risk financing and insurance as a long-term agenda. While simple measures can give quick support to improve financial protection, more complex financial solutions and institutional change require technical expertise and political will (World Bank, 2014).

Real world examples

Numerous countries, among them Colombia, Indonesia, Panama and Peru, have established fiscal risk management divisions within the Ministry of Finance tasked with management of fiscal risks associated with natural disasters. Jamaica is a good example of a country with a comprehensive disaster risk financing strategy (see Box B11). Recently, the Ministries of Finance of four **Pacific Alliance** countries joined efforts and in 2018 developed the issuance of a catastrophe bond that provides risk coverage differentiated by country: $500 million for Chile, $400 million for Colombia, $260 million for Mexico and $200 million for Peru. Initially designed to cover earthquake risks, the group is analyzing the possibility of a similar bond to include hydrometeorological risks (Delgado et al., 2021).

In 2007, the **Caribbean Catastrophe Risk Insurance Facility** (CCRIF) was established to provide support to limit the impacts of disasters to Caribbean and Central American governments by providing liquidity upon activation. CCRIF offers parametric insurance policies for tropical cyclones, earthquakes, rainfall and fishery activities. Since its inception in 2007, the mechanism has made 54 payments for hurricane, earthquake and rainfall damage to 16 member governments, amounting to more than $244.8 million (CCRIF, 2021). These payments are determined based on the coverage and materialization parameters defined in each policy, including the estimated losses incurred due to the disaster. (See also Box B11.)

Mexico has developed comprehensive disaster risk management structures and programs, with initiatives including disaster risk financing and insurance strategies to manage the financial risk posed by disasters. The Ministry of Finance recently reformed the Fund for Natural Disasters to support disaster relief and reconstruction through a budgetary program to guarantee a prompt and more efficient response in the event of an emergency and strengthen the comprehensive public policy strategy. The Fund has a catastrophe risk financing strategy to leverage its resources, relying on a layered combination of risk retention and risk transfer instruments that has prevailed after changes to the first stage of the strategy. In 2006, Mexico became the first country to issue a sovereign catastrophe bond, and in 2011 insurance against catastrophic risks was contracted for the first time. To ensure correct implementation of the disaster risk finance strategy, the Ministry of Finance works closely with the National Center for Disaster Prevention (CENAPRED) and the National Civil Protection System (SINAPROC).

Countries have also made use of contingent disaster loans. This type of loan works similarly to a line of credit, making eligible disbursements upon compliance with a series of preset conditions, such as parameters related to the climate-related event (type of disaster, intensity, location, etc.), existence of an integrated risk management program, and request within a period close to the occurrence of the disaster. Along these lines, in 2009 the Inter-American Development Bank (IDB) created the Contingent Credit Facility for Natural Disaster Emergencies (CCF). The CCF has provided $1.9 billion in natural disaster contingency funds, helping to improve the response capacity of countries in the emergency response phase and increasing their financial resilience (Eguino and Delgado, 2023). Other MDBs such as the World Bank have established contingent financing for natural disasters.

Box B11. The role of Jamaica's Ministry of Finance in developing a Disaster Risk Financing Strategy

Governance framework and risk strategy

The implementation and maintenance of a strategy to counter the fiscal risks of natural disasters are as important to Jamaica's economic security as the preservation of foreign exchange reserve adequacy and debt sustainability. From 2001 to 2012, the total cost of damages from various climate-related events (including hurricanes, tropical storms and floods) amounted to J$111.8 billion (US$745 million) or cumulatively 18.7% of GDP (Climate Change Policy Framework for Jamaica, 2015). The mean annual temperature for Jamaica is projected to increase by 1.1°C–3.2°C by the 2090s, based on existing models, with significant changes in sea-surface temperatures and rainfall patterns expected.

Jamaica has developed a comprehensive, multi-layered national Disaster Risk Financing (DRF) Strategy to improve government capacity to access immediate financial resources in the event of a national disaster. This strategy is outlined in the National Natural Disaster Risk Financing (NNDRF) Policy, which addresses deficiencies in how the budget responds to the impacts of natural disasters.

Financing instruments

The Ministry of Finance and the Public Service (MOFPS) provides budgetary space, in annual and supplementary budgets, to enable a response to more frequent, low-impact natural disasters. Among the other financing instruments outlined in the DRF Policy, the government capitalized its Contingency Fund in 2019 with J$4 billion (US$27 million). Signaling future intent to provide for unforeseen disaster-related expenditures of any kind, including climate-related disasters, Jamaica also significantly increased the Contingency Fund cap from J$100 million (US$670,000) to J$10 billion (US$67 million).

Prior to this, in 2018, Jamaica entered into a Contingent Credit Claim with the Inter-American Development Bank (IDB) that disburses funds in the event of a natural disaster; the government also renewed the Caribbean Catastrophe Reinsurance Facility (CCRIF), which provides coverage against hurricanes, earthquakes and excessive extreme weather events. In July 2021, Jamaica successfully placed a catastrophe bond in global capital markets through the World Bank Group, which makes the quarterly coupon payments. These layers—budgetary provisions, the Contingency Fund capitalization, the Credit Contingent Claim, the CCRIF, and now the catastrophe bond—address different types of natural disaster risk, from high-frequency, low-impact to low-frequency, high-impact events.

Jamaica's catastrophe ('cat') bond cover is provided for three hurricane seasons ending in December 2023. Cat bonds pay a higher premium than regular bonds and are much shorter in duration. The cat bond is globally pioneering the 'cat-in-a-grid' trigger approach, which places a network of grids over Jamaica and surrounding waters, each grid having a centralized air pressure threshold. Payout is triggered if a hurricane passes through a grid and has centralized air pressure at or below the threshold for that grid. Payout size is related to how many grids are breached. This granular approach allows the country to optimize and provide higher thresholds for geographical areas where losses are likely to be higher from a direct hit.

The World Bank Treasury acts as an intermediary between Jamaica and cat bond investors. Premiums are collected from Jamaica and funds are remitted to the investors in the form of bond coupons. It also holds custody of the principal invested by the investors and will pay this out to Jamaica if a natural disaster event breaches the established thresholds. The Governments of the UK, Germany and the US assist Jamaica with grants that pay the premium for the catastrophe bond over the three hurricane cycles it covers, including

the 2022 season. The expectation is that Jamaica will finance the premiums on renewal as the country's fiscal dynamics continue to improve.

Tools

The Coalition of Climate Resilience Investment (CCRI) developed the Jamaica Systemic Risk Assessment Tool (J-SRAT) through a pilot project to assist the MOFPS in conducting climate risk assessments. This is intended to help identify 'hotspots' or concentrations of physical climate risk across the country's major infrastructure networks. Jamaica pioneered this tool, which enables data-driven risk analysis. The J-SRAT also assesses practical impacts of increasingly severe weather events on specific services, such as more frequent water or power shortages, and can compute the damage and economic losses from future climate risks in different time horizons. The Jamaican example demonstrates the need to bridge the gaps for the development of more data-driven solutions to support physical climate risk assessment and regular prioritization exercises for the efficient allocation of resources, which include technology availability, data management and local capacity-building.

Lessons learned and recommendations

The MOFPS is supported by multilateral and bilateral partners to advance disaster risk management, financial modeling and increase the response consistent with the country's macroeconomic framework. Jamaica's capacity to deliver on its commitments as part of the climate change agenda is supported by availability of technically-qualified staff in its various ministries. As the country progresses in the implementation of its NDCs, it will be necessary to ensure the necessary technical, financial and human resources are in place to support enhanced coordination, and the development and implementation of investment strategies to mobilize climate finance at scale. The provision of these resources represents a significant challenge, and more support is needed as capacity is an important issue across the Caribbean.

Based on Jamaica's experience in institutionalizing the management of the fiscal risk of natural disasters, a key recommendation is for this imperative to be maintained beyond the life of any political administration. Additionally, the MOFPS has placed a special emphasis in maintaining macroeconomic and debt sustainability. To achieve macro-fiscal goals, minimize impacts on GDP, and correct for economic impacts from natural disasters and other risks, Jamaica has introduced a shift in the disaster management paradigm to include ex-post and ex-ante responses.

Finally, the Strategy presents an opportunity to link this type of macro-planning and disaster risk financing to safeguarding socioeconomic value-at-risk and investments in the context of NDCs and resilience-building. This approach could be useful for other Ministries of Finance.

Source: Prepared by the Jamaican Ministry of Finance

Jamaica's Strategy presents an opportunity to link this type of macro-planning and disaster risk financing to safeguarding socioeconomic value-at-risk and investments in the context of NDCs and resilience-building. This approach could be useful for other Ministries of Finance.

Opportunities for action

The growing incidence of climate hazards demands a more proactive and central role from Ministries of Finance to deliver successful disaster risk financing and insurance measures. They should seek to develop comprehensive risk finance and insurance strategies, as part of broader sustainable finance efforts, taking steps to:

- Consider establishing specialized fiscal risk management divisions tasked with the identification, quantification, disclosure and management of physical climate risks.
- Strengthen risk and financial vulnerability assessments to better understand the impact of disasters, target financial assistance, and improve the cost-effectiveness of recovery assistance.
- Promote awareness of the need for financial preparedness to manage disaster risks based on a clear understanding of the allocation of responsibility for disaster costs.
- Encourage the development of disaster risk financing tools and markets, alongside enhanced prevention of disaster risks.
- Enhance technical and institutional capacities and coordination among domestic stakeholders involved in the management of disaster risks.
- Research the potential benefits of international cooperation on the management of fiscal exposures, including the greater use of regional risk pooling.
- Enhance the financial capacity of insurance companies to cover disaster losses, supported by appropriate legislation and regulation.

Function 3e. Leveraging international climate finance and reforming the global financial architecture

In this subsection we address:

i. Getting climate finance 'ready' and leveraging MDB and DFI capital
ii. Accessing international carbon markets
iii. Setting up country platforms

i) Getting climate finance 'ready' and leveraging MDB and DFI capital[48]

Context and role of Ministries of Finance

Multilateral development banks and development finance institutions can play a crucial role in supporting Ministries of Finance in eligible countries to drive sustainable investment strategies. They often have the long maturities and low interest rates required for sustainable infrastructure finance and they enjoy informal preferred creditor treatment. This role can often extend beyond their direct financing through the provision of technical assistance to develop concrete project pipelines that can attract private investors. They can combine loans with grants, technical assistance, and policy and institutional guidance, and play a countercyclical role by extending credit during downturns (Bhattacharya et al., 2021). They can play an especially critical role in helping to tackle the high cost of capital in emerging markets and developing countries, where borrowing costs can be upwards of 10% compared with 1–4% for countries able to issue an international reserve currency (CPI, cited in Songwe et al., 2022). When perceived country-, technology- and project-specific risks are added, this can render a large proportion of mitigation projects commercially unviable in developing countries (World Bank, 2023).

[48] We are cognizant that the state of the evidence in this area is in considerable flux and subject to evolution in the state of the art, especially in relation to MDB reform and going beyond the $100 billion.

The MDBs have substantial experience with de-risking private capital in the context of investment projects, during the construction and operational phases. The International Finance Corporation (IFC), for example, accounts for just under half of all private capital mobilization by official bilateral and multilateral development agencies combined (Bhattacharya et al., 2021). It is noteworthy that the IMF has recently approved the establishment of the Resilience and Sustainability Trust (RST), with a target base of $42 billion, to help countries build resilience to external shocks and ensure sustainable growth (IMF, 2022c). This complements its existing lending toolkit by focusing on longer-term structural challenges—including climate change—that entail significant macroeconomic risks and where policy solutions represent a strong global public good. About three-quarters of the IMF's membership will be eligible.

Similarly, international and bilateral official development assistance (ODA) worth over $179 billion globally (OECD, 2021b) can be used by Ministries of Finance to support global and local public goods, including climate mitigation, adaptation and resilience investments in poor and vulnerable countries. ODA can help to cover some of the upfront costs of the low-carbon transition and to help lower the cost and de-risk sustainable infrastructure projects. In addition to mainstream ODA, the UNFCCC has established several dedicated climate funds to serve developing country parties to the Paris Agreement. These include the Global Environment Facility (GEF), Green Climate Fund (GCF), the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF), and the Adaptation Fund. The UNFCCC website includes a climate finance data portal to help countries better understand the climate finance process.

Ministries of Finance from certain countries are also major shareholders in the MDBs, including regional development banks, and from this position can call for enhanced international climate finance. Ways to do this are currently under discussion: for example, Ministries of Finance can consider supporting proactive capital increases for facilities such as the International Development Association and regional development banks such as the African Development Bank (AfDB), Asian Development Bank (ADB) and Inter-American Development Bank (IDB). They can consider encouraging the MDBs to stretch their current balance sheets by better accounting of callable capital, reforming statutory lending limits, balance sheet optimization, greater risk pooling, and faster turnover of assets. They can consider supporting efforts to extend special drawing rights, which can assist countries in opening up fiscal space. And they can consider encouraging the greater use of guarantees and insurance, which account for less than 5% of MDB activities despite mobilizing around 30% of private co-finance (Blended Finance Taskforce, 2019; Humphrey, 2020). One calculation suggests the major MDBs could raise lending by $750 billion with no change in credit rating (Humphrey, 2020). Shareholders and other countries can also continue to encourage an increase in international climate finance, especially concessional finance and finance for adaptation investments.

The Bridgetown Initiative contains five specific proposals that could make a significant difference to international climate finance: setting up a Climate Mitigation Trust that borrows with the backing of $500 billion of special drawing rights, donor guarantees or similar, widening access to concessional finance for climate-vulnerable countries, expanding MDB lending for climate and the SDGs by $1 trillion, funding for loss and damage, and making the financial system more shock-absorbent through natural disaster and pandemic clauses in lending instruments. **The Sharm el-Sheikh Implementation Plan** developed at COP27 (UNFCCC, 2022b) considers the design of a new funding mechanism for assisting developing countries that are particularly vulnerable to the adverse effects of climate change in responding to loss and damage, including through mobilizing new and additional resources. This process is due to complete by COP28. The Summit on a new **Global Financing Pact** to be held in June 2023 in Paris, in close partnership with the COP28, G20 and G7 presidencies, also intends to draw from the proposals and commitments to ensure support for most vulnerable countries to address their most urgent needs and to undertake necessary reforms to the international financial architecture to accelerate an equitable global transition toward net zero.

Barriers to action and ways to overcome them

Many countries eligible for concessional or non-concessionary finance are not yet well equipped to receive growing pools of global financial resources for climate action through the MDBs or DFIs. Being 'climate finance ready' refers to the ability to access, allocate, distribute and make use of financial resources for climate action, plus the monitoring and reporting and results of their use. Combined with often challenging MDB and bilateral donor access requirements and the plethora of different MDBs and donors with different geopolitical motivations, this acts as a major barrier to accessing finance. There are currently more than 50 international public funds providing 'green' finance (UNDP, 2015).

Strong fiduciary capacities, compliance with environmental and social safeguards, and strong implementing entities are critical for enhancing access to resources (UNDP, 2015). Accreditation for some climate funds can be time-consuming, taking up to two years and hundreds of documents in some cases (Gogoi and Venkatramani, 2021).

Ministries of Finance should focus on enhancing their capability—and that of relevant line ministries—to proactively identify and coordinate sources of international climate finance. This process is not likely to be driven by external agencies in the main nor be as effective as strong domestic leadership.

Two actions by Ministries of Finance can be especially powerful to help overcome these barriers:

- **Establish a dedicated coordination entity**, often called a Climate Finance Unit (CFU), which can be located within the Ministry of Finance or key sectoral line ministry to identify and coordinate international climate financing sources, including from NGOs.
- **Enhance or establish new financial vehicles** (which might be sector-specific) to ensure resources are effectively and transparently managed. These should be capable of blending multiple sources of finance (see Function 3c). Many countries use national development banks for this purpose. (Gogoi and Venkatramani, 2021)

Ministries of Finance could also play a greater leadership role in the special climate funds established by the UN system or other international entities, working closely with Ministries of Environment, Foreign Affairs and Development.

Real world examples

A growing number of Ministries of Finance are showing leadership in working with other agencies to attract flows of climate finance:

- **Brazil** and **Mexico** have both used their national development banks to act as the principal fiduciary agencies to organize the dispersal of international climate finance. The Brazilian national development bank (BNDES), the central financing agency for development in Brazil, manages several financial vehicles for climate change activities: the Amazon Fund provides resources to projects that combat deforestation and promote sustainable use of the Amazon, for example. BNDES also finances Clean Development Mechanism projects through an investment participation fund (FIP). In Mexico, the NAFIN Sustainable Fund was created in 2021 by the national development bank Nacional Financiera (NAFIN), a public trust to receive and disperse non-reimbursable resources from international financial institutions and third parties that do not come from the national public budget, to support institutional projects and programs of the federal public administration agencies and entities along with initiatives from other entities that contribute to the sustainable development agenda.
- The **Rwanda Green Fund**, FONERWA, was launched in 2012 as the principal financial vehicle for Rwanda's climate finance efforts. FONERWA has mobilized $216 million in domestic and international finance, most of which has gone to mitigation. Mobilizing private sector finance into the climate space alongside international capital has been a significant challenge in Rwanda, so the Ministry held capacity-building training and private sector outreach efforts in 2018 and 2020 to provide a space for ongoing dialogue and to promote climate action by the private sector.

ii) Accessing international carbon markets

Context and role of Ministries of Finance

Voluntary carbon markets (VCMs) and the mechanisms established by Article 6 of the Paris Agreement represent potential innovative sources of concessional finance for decarbonization, especially for emerging markets and low-income countries (Songwe et al., 2022). VCMs and Paris Article 6 differ from 'compliance' carbon pricing instruments created by governments (see Function 2a) because participation is not enforceable by law. VCMs operate independently and allow projects and programs to issue credits, subject to any legal requirements set by governments. Article 6 mechanisms give governments in host countries greater control over finance flows than that afforded by carbon credit issuance using private standards. They also include new rules to prevent double counting of credits by preventing home and host countries from both counting emission savings toward their NDCs (the country selling carbon credits has to deduct them from their own greenhouse gas inventory so that the country buying them can count them toward its own climate targets).

Carbon finance can either target projects that are challenging for other actors to reach or facilitate and amplify investments through other channels, thereby playing a complementary role in a wider global financing strategy. Projects and jurisdictional programs alike can issue credits, so finance can flow to private actors or supplement public budgets. Low-income and middle-income countries could especially benefit from finance for actions such as integrated forest management, deploying clean cookstoves, and protecting and restoring coastal ecosystems. Furthermore, high-quality carbon credits can also advance progress on SDGs besides Goal 13 on climate action, through providing co-benefits for other goals like biodiversity or local economic development.

VCMs and Article 6 represent separate but closely related channels for raising finance for mitigation activities, but may converge over time and/or be linked to compliance markets. Countries have the option of selling mitigation outcomes themselves under Article 6.2, authorizing their sale by non-state actors through the Article

6.4 mechanism, or allowing private trades through the voluntary market. Their choice will affect their control over projects, use of revenues, and NDC accounting. Market-wide standards for VCMs are still being developed and may eventually reflect many of the Article 6 rules, but so long as rules diverge, governments may seek to use a range of mechanisms to raise finance for different sectors. Carbon taxes and emission trading systems can be linked to voluntary markets to raise liquidity and harmonize carbon prices across sectors, but doing so presents risks for integrity if MRV or safeguards are not robust.

Recent efforts have focused on breaking down barriers between traditional climate finance and carbon market siloes. Proposals have reimagined Article 6 as a way for Ministries of Finance to attract concessional debt, low-return equity or guarantees, aiming to bring down the cost of capital for clean infrastructure projects and de-risk private investment (Sandler and Schrag, 2022). These proposals could transform carbon markets into a vehicle for upfront project finance, and are now being studied and implemented by the World Bank, which is actively seeking partner countries.

Barriers to action and ways to overcome them

A degree of caution is needed as harnessing the potential of carbon markets requires strong governance and institutional capacity, including to ensure robust environmental, human rights and wider safeguards (Florini and LaForge, 2022; German Environment Agency, 2020). Transparency and integrity around the impact of investments, in terms of saved emissions and wider sustainable development impacts, is essential to build confidence among buyers and attract investment, and in turn requires a strong ecosystem of independent verifiers, providers of data on credit impacts, and carbon credit registries. Strong participation in programs and projects by impacted communities, including indigenous and vulnerable groups, is especially important to prevent negative outcomes like human rights violations and instead drive positive social impacts.

Technical capacity is also needed to develop an approach to carbon markets that is embedded in governments' wider strategies and development priorities. To navigate the trade-offs between raising carbon finance and retaining emission savings to use toward NDCs, governments must consider which international carbon market mechanisms can best support sectors in need of additional investment. Clarifying the scope of NDCs and implementation plans, and procedures through which private actors can seek approval (and, where relevant, Article 6 authorization), is key to facilitating project development (Clifford Chance, 2022). Host country governments that are unwilling to authorize credits under Article 6 and make 'corresponding adjustments' to their emissions inventory can still allow buyers to purchase credits representing a 'mitigation contribution' to the country's NDC—either by selling non-authorized credits through Article 6.4 or defining relevant legal frameworks for VCMs.

Ministries of Finance should be especially cognizant of the live debates concerning the role of voluntary carbon markets in wider decarbonization strategies. There is an emerging view that carbon offsets should only form a small proportion of public and private climate commitments (with a focus less on 'net' and more on 'zero'). The net zero standard of the Science-Based Targets Initiative (SBTi) rules out using carbon credits to meet interim targets on an organization's science-based pathway but encourages the financing of additional climate mitigation beyond those targets (SBTi, 2021). SBTi will produce further guidance on 'beyond value-chain mitigation' in 2023. The UN High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities has reinforced this guidance (UN HLEG, 2022).

Strong engagement between coalitions of market stakeholders and host country governments is key to determining the appropriate role that credits can play in their financial strategies and to navigate issuance. Ministries of Finance should play a leading role in this dialogue, alongside Climate, Environment and other ministries. Ministries of Finance will have to take some responsibility for incorporating high-integrity standards for

carbon credit issuance and use in sustainable financing, in partnership with regulators. For instance, they can support appropriate use of carbon credits that encourages ambition but does not undermine decarbonization of corporate supply chains by seeking their inclusion in regulations on private transition plans or sustainability disclosure requirements. In addition, MRV is a key building block that Ministries of Finance should support, through funding internal government capacity such as for development of REDD+ action plans and accounting tools and by fostering a strong ecosystem of domestic and international market players (UNDP, 2021a).

Real world examples

Several countries are actively preparing to access international carbon markets.

- The **Africa Carbon Markets Initiative,** launched at COP27, is a platform convening many governments alongside international organizations to scale up finance flows through VCMs to countries across the continent. Its initial activities include mobilizing supply and demand by outreach and technical assistance to project developers and boosting available finance mechanisms; convening African and international corporations to develop an advance market commitment for African carbon credits; promoting integrity standards and adapting them to be suitable for local contexts; and coordinating an ecosystem of stakeholders including verification and validation bodies and carbon credit exchanges and marketplaces (ACMI, 2022).
- **Guyana** and **Peru** are among national and subnational governments that have issued or are preparing to issue credits for forestry (REDD+) activities at the jurisdictional level.
- **Nepal** and **Cambodia** are among countries receiving support from the Global Green Growth Institute to prepare for Article 6 trading, including credit authorization, reporting to the UNFCCC, and assisting project developers (GGGI, 2023).

Revenues from carbon credits could be blended with other sources of finance to support pioneering projects or technologies in 'frontier' countries that would otherwise struggle to attract capital. An example is the Restoration Insurance Service Company (RISCO), a social enterprise piloted in the Philippines, which partners with local communities to conserve and restore mangroves, generating and selling blue carbon credits to repay its investors.

iii) Setting up country platforms

Context and role of Ministries of Finance

Country platforms are another way that Ministries of Finance can seek to bring together multiple sources of finance (including international concessional) in key sectors such as energy or transportation; these can complement efforts to develop sustainable finance roadmaps. Country platforms are vehicles designed to coordinate and leverage private and other sources of finance, especially international, at significant multiples. They seek to draw on blended and innovative financial instruments to improve risk–return ratios and connect standalone private and other sources of finance with major sector priorities in NDCs, NAPs and LTSs. They are likely to be most relevant for emerging markets and developing countries.

Country platforms have recently emerged as a model to act as a single focal point for channeling technical assistance and public, private and international finance to support the delivery of NDCs. They have been recommended by many global bodies and institutions, including the MDBs, G20 Finance Ministers, and the UN's Special Envoy on Climate Action and Finance. It is estimated that country platforms could help mobilize $1 trillion annually of new private capital flows by 2025 in EMDCs (Carney, 2021).

The essential idea is to develop government-led and -owned platforms to rapidly scale up financing for sustainable infrastructure in priority sectors such as energy or transportation, by:

- Providing a single forum for coordinating financing for Paris-compatible projects across a broad range of sources (public, private and international).
- Addressing upstream and downstream barriers to investment through provision of, for example, coordinated technical assistance services for project pipeline development.
- Providing enhanced access to a range of blended and innovative financing structures to improve risk–return profiles, including by drawing on the expertise of the MDBs and DFIs.

The key feature of a country platform is the combination of political leadership by a government to tackle a problem of broader global benefit, enabled by a significant package of concessional financing and coordination structures. A government, for example, can make a commitment to phase out the use of coal or end deforestation by a particular date and develop a country platform to address this specific goal as part of its NDC and long-term strategy. To be a success, country platforms need to have a clearly defined structure and set of governance arrangements led by government and including relevant government representatives, internal coordination mechanisms, and be supported by a range of shared commitments by the government, private sector and development partners.

Barriers to action and ways to overcome them

Establishing effective country platforms can be challenging, especially in EMDCs, with common obstacles including a lack of incentives for governments to take the lead; complex stakeholder coordination (including among ministries and with development partners); insufficient technical or implementation capacity; and potential constraints to the effective involvement of the private sector (World Bank, 2023).

Country platforms therefore tend to work better when designed to deliver specific targets or objectives tied to a major government priority such as phasing out coal or fossil fueled vehicles. It is critical that governments exercise ownership, lead, and have a clear vision of a specific strategic area to be acted upon that can be politically sustainable over the medium term; that development partners are interested and committed to assist in that specific area; and that rigorous analytical work can be used to help identify priorities, opportunities and solutions. There must be country ownership, to ensure trust and legitimacy, encourage competition, retain a government's flexibility to engage with the most suitable partners, and match platform design to state capacities (Bhattacharya et al., 2021).

Real world examples

A few emerging examples of country platforms are emerging in the climate space. COP26 (in 2021) saw the launch of the International Just Energy Transition Partnership by **South Africa** (a partnership with France, Germany, the UK, US and EU, who committed $8.5 billion over the following three to five years). This can be viewed as an early test case. Building on the South African experience, just energy transition partnerships have since also been agreed with Indonesia and Vietnam, and a country-led platform has been set up for the Nexus of Water, Food and Energy (NWFE) in Egypt. Other emerging platforms have applied different approaches, including relying and building on existing coordination mechanisms. The experience to date has been mixed, with effectiveness largely determined by the strength of country ownership from the point of inception.

Some elements of country platforms exist in a range of global initiatives that Ministries of Finance could learn from and build upon. These include efforts such as the Climate Finance Accelerator (CFA), the Global Infrastructure Facility's Country Mobilization Platform Initiative, the Climate Finance Leadership Initiative (CFLI), NDC Partnership, and Fast Infra ('Finance to Accelerate the Sustainable Transition – Infrastructure').

Opportunities for action

Ministries of Finance, especially those in ODA-eligible countries, should develop climate finance strategies to set out the investment needs to achieve their NDCs and Long-Term Strategies. These should be based on investment needs assessments (see Function 2).

Ministries of Finance from countries that are major shareholders in the MDBs, including regional development banks, should proactively call for enhanced support for climate action through building coalitions to explore options for scaling up finance and reducing the cost of capital.

Shareholders and other countries should continue to encourage an increase in international climate finance, especially concessional finance and finance for adaptation investments. All Ministries of Finance should engage in the process of designing a new funding mechanism to support climate-vulnerable countries cover to the costs of loss and damage, including through mobilizing new and additional funds.

Ministries of Finance should proactively consider the contribution voluntary carbon markets could make to their net zero investment plans, particularly by filling gaps in the existing landscape of climate and development finance, while at the same time giving special attention to the integrity of carbon credits and application of appropriate safeguards. They should develop supportive legal frameworks and regulations to govern carbon credit issuance and use. They should also invite collaboration with MDBs and regional DFIs to create enabling environments and access concessional finance to protect against uncertain carbon credit prices and project outcomes.

Ministries of Finance should consider working with other line ministries and international partners (e.g. MDBs and DFIs) to establish country investment platforms in a small number of strategic priority areas, such as ending coal use, phasing out fossil fuel vehicle use, ending deforestation, or investing in resilience. Ministries of Finance should:

- Ensure these priorities are backed up by investment plans that can be translated into concrete projects to leverage interest and resources from development partners and the private sector.
- Consider how such platforms could be effectively and transparently governed, financially structured and effectively communicated.
- Engage in structured dialogue to inform the design of the platform with the private sector, development partners and civil society.
- Consider how to build in measures to ensure a just transition.
- Learn from the early lessons of new emerging platforms, such as that being developed in South Africa, which underscore the importance of strong government leadership.

All Ministries of Finance should engage in the process of designing a new funding mechanism to support climate-vulnerable countries to cover the costs of loss and damage, including through mobilizing new and additional funds.

Crosscutting: ensuring a just transition[49]

A just transition ensures a fair and wide distribution of benefits along with targeted support for those individuals, businesses, organizations and regions that may be adversely impacted. Functions 1–3 above touch on many aspects of climate policy that require proactive consideration of the distributional consequences, social dialogue and stakeholder engagement in their design and execution, from carbon pricing and subsidy reform to ensuring adequate investment in economy-wide skills and training. This section examines the just transition in further detail.

Rationale for action and role of Ministries of Finance

A strong focus on a just transition across all action and investment areas will be crucial to ensure no one is left behind in the transition. Ministries of Finance must play a central role and have a twofold rationale to support the just transition:

- **First, a just transition is necessary to address the fundamental political economy of net zero and build public trust.** Without conscious strategies to ensure no one is left behind, there could be political backlash that could risk slowing the process of decarbonization, whereas active anticipation of change and shaping of net zero pathways to include social factors will accelerate delivery of environmental targets. Climate change is a systemic risk but so is inequality and the road to net zero should not increase social risks.
- **Second, a just transition is the smart way of building a strong and resilient net zero economy** by developing essential skills, capabilities and social institutions: addressing the human and social capital required for net zero and taking a people-centered approach. At the heart of the just transition is the principle that those affected by change need to be involved in shaping it, whether in the workplace, in communities or in national policy.

Ministries of Finance will only be able to reap the full benefits from the transition to a net zero, climate-resilient world if the transition is a just one. Protests against proposals to reduce energy subsidies in developing countries, the *gilets jaunes* (yellow vests) movement in France that rejected the government's plans to increase fuel taxes, or the failure in many countries to retrain coal workers and generate employment in other industries have illustrated the challenges facing governments that do not mainstream the just transition into policy design.

Ministries of Finance should ensure that climate policies consider their potential positive and negative social impacts, and that affected stakeholders are included in decision-making. This is reflected in some of the recommended ways ahead for policy design that have been named throughout Functions 1–3. It implies an important role in supporting key line ministries (and Labor Ministries in charge of social dialogue) in the policy appraisal process, including through distributive impact assessment. It also implies looking carefully at the fiscal incentives, regulations and financing mechanisms to scale up investment in net zero, climate-resilient activities to ensure positive social impacts for all workers, communities and consumers.

Most countries are currently failing to adequately take account of just transition matters. In many countries awareness is growing of the fact that to have the best chance of effective and lasting implementation of climate and environmental actions, it is essential to take a just transition angle (Chan et al., 2022). Still, in most cases the just transition elements of recent policies could be considerably stronger while in many they are absent, particularly as the focus of just transition efforts has been almost exclusively on the energy system at the exclusion of other sectors. There is also significant regional variation, with policies reviewed from Europe, North America and South Africa exhibiting the strongest just transition elements (ibid.).

[49] This section is based on contributions from Sabrina Muller (formerly Grantham Research Institute, LSE) and Ishac Diwan, Martin Kessler and Yomna Mohei Eldin (Finance for Development Lab).

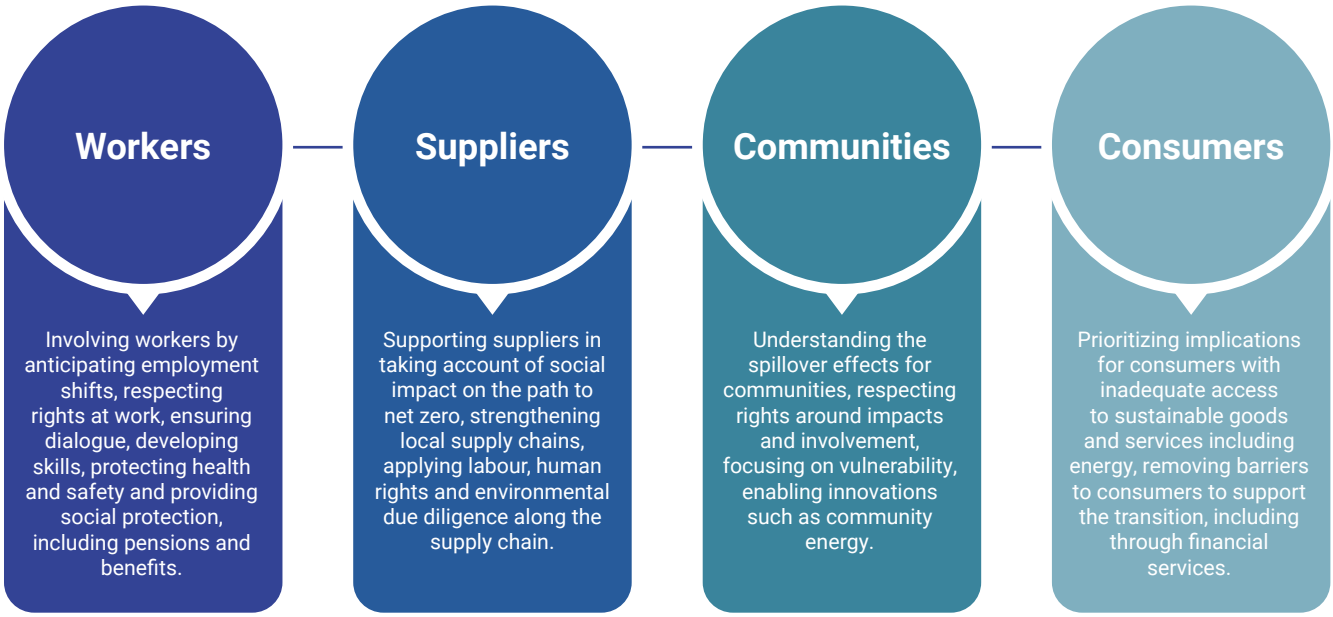
Common themes and sectors that are especially pertinent for Ministries of Finance to consider include:

- **Managing potential job losses in impacted sectors and new sources of employment.** The green transition could result in 6 million job losses, with 2 million of them in the fossil fuel mining and extracting industries (ILO, 2018). While these are expected to be more than offset by the creation of new 'green jobs' and the transformation of existing jobs (ILO, 2022), this does create significant transition challenges. Moreover, as many developing countries rely on commodities as their main exports, this means that the job losses resulting from the green transition would not affect developing and developed countries equally. Vulnerable regions like Africa and the Middle East are expected to have net job losses in the short to medium term, while the Americas, Asia and Europe are expected to have net job creation (ILO, 2018). While the extent of net employment loss or creation will be partially determined by the proactivity of governments in identifying growth and investment opportunities in the new economy, Ministries of Finance should have a central role in the design of transition plans to achieve a managed decline of carbon-intensive industries, supporting workers and regions affected by those changes, and bringing new sources of employment in the green economy.
- **Energy subsidy and carbon pricing reforms.** In developing countries, energy subsidies are often large. They tend to encourage over-consumption of energy, benefit mainly high earners, and are costly. Removing energy subsidies and taxing polluting sources will be critical to a green transition but can mean higher energy prices in the near term, which hit vulnerable groups the most. Ministries of Finance have a central role to play in considering targeted social-protection measures and ways to ensure revenues are rerouted toward driving job creation, sustainable infrastructure provision and reducing inequality. For instance, Ireland uses its carbon pricing revenues in targeted social welfare and initiatives to prevent fuel poverty (see Box B12).
- **Resilience and adaptation policies.** Adaptation policy is an important tool to support climate resilience, reduce negative impacts of climate change and avoid costly lock-ins. Within countries, the poorest tend to be more affected by climate change. They are less insured against extreme events and have less ability to self-insure; they tend to live in more exposed marginal lands; and they work in sectors like agriculture that are more exposed. When designing resilience and adaptation policies, Ministries of Finance will thus need to ensure just transition programs include support for helping the poorest adapt to climate change.
- **Financing policies and transition finance.** Financial standards and regulations will be crucial for driving business and finance to manage environmental risks and seize sustainability opportunities. Ministries of Finance will need to work with regulators to incorporate the just transition into financial standards and regulation, including in terms of disclosure. They will also need to engage in defining existing emitting activities that might require transition finance. The multilateral and regional development banks can play an important supporting role here.
- **Gender.** A gender-sensitive transition can be advanced by supporting women's representation and equal participation in all activities and decision-making bodies related to climate action. There is growing recognition that climate change affects women and men differently and could exacerbate existing inequalities, threatening the achievement of the SDGs. Meanwhile, evidence suggests that female representation among decision-makers is linked to more effective climate policy (Mavisakalyan and Tarverdi, 2019). Ministries can also promote gender-inclusive approaches to climate financing that recognize gender-specific barriers and facilitate women's equal access to resources. For example, by facilitating women's access to capital, which is often restricted by the unequal ownership of stable assets such as land (Nelson and Kuriakose, 2017), they can promote women's entrepreneurship in the low-carbon economy.

A review of global financial sector practice suggests the following three key factors should be at the heart of any approach that Ministries of Finance take to embedding the just transition into all climate policies and decision-making:

- **Addressing social risks and opportunities.** This should focus on anticipating, analyzing and addressing the potentially negative social impacts and potentially positive benefits of decarbonization for workers, suppliers, communities and consumers (see Figure B4). This is a particular priority for addressing the needs of vulnerable and marginalized groups.
- **Integrating human rights and labor standards.** Well-established social, labor and human rights standards need to be applied to the net zero transition, including: the UN Guiding Principles on Business and Human Rights, International Labour Organization labor standards and the OECD Guidelines for Multinational Enterprises. While the basis for action to achieve net zero needs to be science-based, the just transition needs to be rights-based, with the Paris Agreement itself emphasizing the imperative of the creation of decent work and quality jobs.
- **Ensuring meaningful participation and partnership.** Those affected by change need to be included in decision-making that affects them. Often this will require proactive efforts to empower excluded groups that have traditionally been under-represented in decision-making, for example in terms of income, gender or race. (Curran et al., 2022)

Figure B4. Just transition factors and stakeholders to be considered in climate action



Source: Curran et al. (2022)

Barriers to action and ways to overcome them

A lack of incorporation of just transition principles into national climate strategies is one barrier to fostering a just transition; Ministries of Finance can start to address this through engaging in relevant planning processes and encouraging the participation of Labor Ministries (see Function 1a). Innovative financial solutions that address both environmental and social considerations are also lacking; here, Ministries of Finance can consider sustainability-linked bonds that link to the delivery of broader social benefits (see Function 3b). A further barrier is a lack of dedicated regional regeneration programs for the most vulnerable or impacted sectors and programs to support SMEs in the transition.

Real world examples

Overall, practice from both the public and private sectors on the just transition is at early stages. Learning from experience will be central to moving this forward. The examples highlighted below can serve as blueprints for Ministry of Finance action and can be adapted to different domestic contexts. They can inform and guide Ministries of Finance and other key line ministries, especially in the energy sector. Sunsetting of polluting industries, in particular the coal sector, has long been the main focus of just transition approaches.

- **Canada's** effort to mitigate the negative social impact of its phaseout plan for coal plants is a good example. The groundbreaking Canadian Net Zero Emissions Accountability Act was introduced in 2021, with a 2050 net zero target date. A Just Transition Task Force was established by the Minister of Environment and Climate Change to ensure that the impact of the phaseout on coal-plant workers and their communities is mitigated. The task force prioritized investments in infrastructure, public services and training to attract investors and help affected workers transition toward new job opportunities. There are seed grants and revolving loans for businesses, including a US$150 million infrastructure fund, starting in 2020–21, to support priority projects and economic diversification in impacted communities, and over $100 million devoted to skills training. These programs are now part of the regular budget: for example, the 2021 Budget included a $960 million program to create good jobs in clean energy, $185 million to support the transition away from coal, and $150 million for a green infrastructure fund.
- In **Spain** climate-affected regions must develop just transition agreements between government, businesses and trade unions, leading to targeted investments in coal mining communities and retraining initiatives for workers (WRI, 2021).
- The **EU's** Just Transition Mechanism is a key tool to ensure that the transition toward a climate-neutral economy in Europe leaves no one behind. Working with Ministries of Finance around the EU, it seeks to mobilize around €55 billion over the period 2021–27 to alleviate the socioeconomic impact of the transition in the most affected regions. Measures range from offering re-skilling and facilitating employment opportunities in new sectors to improving energy-efficient housing, investing in public transportation and improving digital connectivity.
- **South Africa's** Just Energy Transition Taskforce provides a mix of mitigation and retraining of workers in the state utility Eskom (see also Function 3d).
- Other mechanisms include the **Climate Investment Fund's** Accelerating Coal Transition (ACT) program, which supports countries around the world to develop socioeconomic measures including upskilling and re-skilling to help people not only retain jobs where feasible, but also prepare for new jobs that become available.

There are emerging examples of ways to infuse the just transition into carbon pricing reforms. This is needed not just because the wealthiest have a greater ability to pay, but also because of the skew in the distribution of carbon consumption: the 1% wealthiest individuals globally, for example, emit about 70 times as much carbon as the poorest 50% (Chancel et al., 2022). Accordingly, calls for implementing a progressive carbon tax as a tool to finance climate adaptation policies have now become more prominent. One type of policy to levy tax on the highest emitters is to introduce a value added tax on high-energy consumption items that are associated with high-income lifestyles (Boroumand et al., 2022; Chancel and Piketty, 2015).

California's cap-and-trade program is an example of utilizing carbon pricing to finance climate adaptation and mitigation, revenue from which is deposited into a Greenhouse Gas Reduction Fund that state agencies utilize to implement programs that further decrease carbon emissions. The cap-and-trade program is also utilized as a tool for just transition, with 25% of revenues required by law to be allocated to environmentally disadvantaged communities, to mitigate the direct health impacts of climate change, and to invest in adaptation and energy efficiency (Kurman-Faber, 2019).

Ireland provides an especially strong example of how to link carbon taxation to the just transition (see Box B12).

Box B12. Ireland: Department of Finance's role in carbon taxation and investing in the just transition

A carbon tax was introduced in Ireland in 2009 and carbon pricing is a central pillar of the country's decarbonization strategy. A carbon tax is levied on suppliers of fossil fuels to Irish consumers, private individuals and businesses, and covers around 50% of all economy-wide CO_2 emissions. The carbon tax applies to CO_2 in the heat and transportation sectors, covering fuels such as kerosene, marked gas oil, liquid petroleum gas, fuel oil, natural gas and solid fuels. It is not applied to sectors covered by the EU emissions trading system (ETS), where emissions are already subject to an EU-wide carbon price.

The carbon tax was introduced following a recommendation from the 2009 Commission on Taxation report that fiscal measures to lower carbon emissions should be phased in. The report recommended the introduction of a carbon tax to apply to fossil fuels, based on tonnes of CO_2 emitted by each fuel, and that the tax should help maximize behavioral change. Initially, the carbon tax applied to motor fuels at a rate of €15/tCO_2 emitted. The government has committed to progressively increase the carbon tax to reach €100/tCO_2 by 2030, with the Finance Act 2020 establishing a statutory increase of €7.50 each year. This has been important in providing a clear signal along with price certainty to consumers, businesses and investors.

While research suggests that the impact of increases in the carbon tax on household costs is extremely limited, the burden falls unequally. For the less well-off, as their income is lower, energy costs typically represent a higher proportion of overall household costs. They are also more likely to live in less energy-efficient homes. This suggests that increasing the carbon tax without taking any compensatory measures is likely to be regressive because it imposes a greater burden (relative to resources) on lower-income households.

The principle of ensuring a just transition is embedded in Ireland's approach to driving climate action, and therefore the government has committed to a progressive carbon tax to protect the most vulnerable in society from the impacts and, where possible, ensure they are better off than before. In 2020 the Economic and Social Research Institute (ESRI) was asked to determine whether the carbon tax could be increased in a progressive manner, with impacts on lower-income households and poverty offset through additional spending on social welfare support. ESRI's analysis found that by recycling one-third of the revenue raised from a €7.50 increase in the carbon tax, the lowest fifth of households in terms of income can be left better-off on average. The research also found that families with young children and people living alone while in receipt of social protection benefits are especially vulnerable to increases in the carbon tax. In light of this research, recent budgets have seen significant increases in targeted social protection supports such as the Qualified Child Payment, Living Alone Allowance and Fuel Allowance. ESRI also found that cumulatively the measures introduced in recent Budgets have been progressive. This independent evidence and transparency on the use of carbon tax funds is critical to its public acceptance.

In addition to assisting in reducing emissions, carbon taxes enable governments to make investment plans based on anticipated receipts, demonstrating commitment to major investment programs in critical areas like energy efficiency, while driving the development of new businesses and upskilling to meet and take advantage of the opportunities afforded by such spending plans. In Ireland, the carbon tax has generated revenues of over €4 billion for the Exchequer. The government has also committed that all the revenue generated by increases in the carbon tax will be used to fund further climate action. Additional spending of €9.5 billion expected to be raised from the planned increased in the carbon tax will be allocated to programs such as energy-efficient retrofits, addressing fuel poverty and providing a just transition.

Key messages and recommendations for other Ministries of Finance

- Agreeing and publishing a schedule of increasing carbon tax rates provides regulatory and investment certainty and enables governments to make investment plans based on the anticipated receipts.
- As the impacts of carbon taxes can fall unequally on households, it may be important to introduce accompanying compensatory measures to counteract regressive impacts, underpinned by robust evidence.
- Governments can use carbon tax funds to advance climate action. Transparent use of carbon tax receipts can assist in enhancing public support in climate efforts.
- While carbon taxes have a key role to play in supporting decarbonization, the use of carbon pricing alone will not be sufficient and thus it must be carefully balanced with other available policy levers, including regulation and financial incentives, and broader measures to support enabling frameworks.

Source: Prepared by the Ireland Department of Finance

Opportunities for action

Ministries of Finance should think of the just transition as a critical enabling factor for the successful shift to net zero, not as a separate goal or 'nice to have' afterthought (Robins, 2022). There can only be one transition and it needs to be just.

Ministries of Finance have an important role to play in ensuring that national climate strategies are politically attractive and economically beneficial for all citizens. To do this, as they develop just transition plans and policies for all key sectors of the economy together with other line ministries and stakeholders, they must ensure that potential positive and negative socioeconomic impacts are considered, that affected stakeholders are included in decision-making and that the private sector participates in just transition measures. Measures should be enacted to ensure all citizens benefit from the transition, including through exploring new ownership models that allow local citizens to financially benefit from renewable energy projects. And they should give particular attention to reskilling workers moving out of dirty and into green sectors; removing subsidies and imposing taxes on polluting sources in a socially just way; investing in resilience and adaptation to protect the most vulnerable against climate risk; and just transition financing.

Adequate attention should be given to just transition plans for agriculture and land use, as these sectors are potentially even more socially sensitive than energy, with more people dependent on them (particularly in developing countries).

Ministries of Finance should think of the just transition as a critical enabling factor for the successful shift to net zero, not as a separate goal or 'nice to have' afterthought. There can only be one transition and it needs to be just.

Capability 1. Leadership and governance for driving climate action

Helsinki Principle 2

Leadership is likely the most significant capability Ministries of Finance need to build. This section touches on all facets of leadership but pays particular attention to strengthening the mandate of Ministries of Finance on climate change (Capability 1a), organization-wide strategies (1b), and the institutional set-up needed to enable climate leadership (1c).

Introduction: Strong leadership for climate action

Addressing climate change involves fundamental transformation across all key sectors of the economy. From their position at the center of government, Ministries of Finance are crucial to both current and future responses to the climate crisis. They shape the national economy and frequently set the boundaries for what other ministries and domiciled financial firms can do. They are also influential in shaping the global financial architecture, macroeconomic norms and regulation through their positions within the networks of global economic leadership, including as shareholders of the IMF and MDBs (Orozco and Jaramillo, 2021).

As well as requiring Ministries of Finance to enhance their core functions, they will therefore have to underpin this with sustained political and technical leadership.

Interviews conducted for this report demonstrate just how important this leadership can be:

> *Climate is now too important, it's too crosscutting, it's too big a priority to have it as a responsibility just for a line ministry. It's something that involves fundamental transformation of the economy. Finance Ministries have always been the hidden opponent in climate policy for many people. So having a Ministry of Finance suddenly engaged on climate and coming out with their own take is something that can really move things in a broader sense.* (Interview with a Ministry of Finance official from a developed country)
>
> *If we don't step up in these areas, we will become a bottleneck because you cannot create comprehensive policies without having a framework to assess the impact on economics and public finances, and how much it will cost. The risk is that later down the line the Ministry of Finance becomes a major blocker because there isn't a strong understanding of the net benefits of the climate-related policies being proposed.* (Interview with Ministry of Finance official from a middle-income country)

Ministries of Finance can be empowered to lead on climate change by the head of government and will need political support from them and from a high-level coordination mechanism on climate change. Proactive engagement of Ministers of Finance with the heads of government and the inter-ministerial coordination mechanism on climate change can help build the necessary political support for the Ministry's leadership.

Their leadership also needs to be supported by effective internal institutional arrangements and dedicated expertise, with commitment by Ministers of Finance and senior officials to ensure sufficient allocation of internal resources, and a strong institutional set-up with the requisite staff capacity. The importance of having adequate staff capacity is demonstrated by the following quote from an interview conducted for this report:

> *The Ministry of Finance has to coordinate input on a large set of priority issues, including fiscal sustainability, debt management, disaster policy, disaster strategies, the different acts, the disaster funds, reserve funds, managing the IMF programs and follow-ups, the World Bank, etc. The units responsible for these issues are comprised*

> *of two to three people. So, asking those same key people to keep up with the amount of consultation that the climate change agenda requires to fully be mainstreamed into economies is unrealistic.* (Interview with Ministry of Finance official from an developing country)

The barriers that Ministries of Finance typically face to fulfilling their climate leadership role include:

- **Lack of commitment to climate change objectives** at the senior management level, and no internal strategy on climate change. This makes it challenging to get staffing and other resources allocated to work on climate-related issues.

  > *Lack of strategy and leadership on climate issues in the Ministry has caused delays in taking work forward. For example, limited internal resources have not grown, delaying and prolonging discussions, reasoning that climate is not part of the mandate and issues are so complicated that there are not enough resources to consider them.* (Interview with a Ministry of Finance official from a developed country)

- **Lack of clarity on the overall mandate of the Ministry of Finance.** While political support for climate action might be in place in certain countries, challenges arise in implementing that commitment because of the Ministry of Finance not having an explicit mandate to drive climate action. While it is clear from Part A that climate action will be key to delivering on the (traditional) core mandates of Ministries of Finance, and that they already have many of the responsibilities necessary to drive change, unless this is explicitly recognized, it can be difficult to secure internal commitment of resources (human and financial), causing delays to the creation of internal capacity, and hence to climate action.
- **Competing (or perceived competing) priorities tend to push climate change into the background,** which makes it challenging to maintain that climate is a priority that requires investment of resources. Various current crises directly impact on climate action, including the COVID-19 pandemic, the war in Ukraine, and the financial, food, energy and cost-of-living crises. Some governments told us that they have had to take difficult decisions to meet the short-term needs of stopping inflation and protecting vulnerable social groups against the rising prices of goods and energy. They acknowledge that some measures, such as discounts in fuel or short-term subsidies for energy-intensive industries, may contradict climate objectives, and profess to finding it challenging to ensure that these measures are only maintained in the very short term and that the commitment to reaching climate change objectives does not change in the medium to long term.
- **Ambiguity in internal responsibility for climate change** leads to insufficient attention paid to priority climate actions and to duplication of efforts. It also challenges relationships with other institutions working on climate change across government.
- **Lack of trust among partners** both inside and outside government is based on doubts that the Ministry of Finance is intent on giving sufficient weight and attention to climate change alongside traditional economic and fiscal policy objectives. Several experts interviewed for this report referred to the Ministry of Finance being seen traditionally as a 'door keeper' on proposed climate projects and policies, and as the player that turns down ideas purely for financial reasons. Furthermore, a lack of continuity in the staff engaging on climate change on behalf of the Ministry of Finance with other institutions (which may be a result of there being no clear designation of responsibilities) can make collaboration and coordination more challenging and potentially affect the credibility of the Ministry on climate change matters.

These barriers are not easy to address, particularly those that require additional resources but there are various steps that Ministries of Finance can take, including clarifying their mandate, developing an internal strategy on climate change, and assessing the required and available capacity internally and through external collaborations.

There is unlikely to be any substitute for clear political leadership by Ministers of Finance, however. A change in commitment to climate change often occurs following a change of government or an appointment of a new Minister who exercises personal leadership in bringing climate onto the Ministry's agenda (see Box B13). Senior officials can play an important role in cultivating such leadership by continually exposing Ministers to the economic and wider opportunities from climate action and the significant economic risks from inaction.

The remainder of this section explains in further detail how Ministries of Finance might galvanize enhanced leadership capability on climate and overcome these barriers to action.

Capability 1a. Strengthening the mandate of Ministries of Finance

Context and role of Ministries of Finance

Ministries of Finance already have an implicit obligation and authority to act on climate change based on their core mandate of protecting fiscal health and sustainable growth of the economy. They also have a responsibility to bridge the widening disconnect between national climate ambitions and the fiscal and financial policies, tools and resources needed for their implementation. However, interpretations of the mandate of Ministries of Finance have sometimes been conservative and focused on economic and fiscal questions, making it harder for the ministries to evolve, consider new challenges, and to enable or drive the economy-wide transformation that is needed for a socially just, ambitious and swift response to the climate crisis. This is especially true when the consensus on economic management—and the primacy of not disrupting markets—makes it difficult for Ministries to challenge the status quo and make system-wide changes, for example setting a new direction for the financial sector (Orozco and Jaramillo, 2021).

It is helpful for Ministries of Finance to develop an explicit mandate and strategy for driving climate action to enable necessary reforms, drive enhanced collaboration with other agencies and mobilize capacity internally. Ministries should operate with the mission, vision and strategy in full alignment with Article 2.1(c) of the Paris Agreement, "making financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development". In some countries there may be an additional mandate specifically outlining an obligation to act on climate, usually through a climate law or a governmental order for all agencies to address climate change. However, the Ministry of Finance itself can initiate clarification or an amendment of their mandate to explicitly include climate change. This can be done via a mission statement, including climate change explicitly in the Ministry's internal strategy, or through developing a specific internal strategy focused on climate change.

> *There is no better opportunity for the Ministry of Finance to better define its role, assume a mandate and assume leadership.* (Interview with a Ministry of Finance official from a developing country highly vulnerable to climate change)

Having a clear mandate on climate change can help enable Ministries of Finance to secure internal buy-in to the agenda and assess the required expertise, resourcing and institutional set-up. It also helps justify the commitment of resources and creation of dedicated capacity. The mandate should define an institutional vision and how the Ministry sees its role in carrying out the objectives of protecting the economy from climate impacts and driving toward net zero. If the Ministry of Finance lacks clarity on its position or its mandate on climate action, it may become entirely dependent on the Ministry of Environment (and/or other line ministries) to drive the agenda and serve the wide range of different sectors and agencies required for climate action. That would remove the ability of the Ministry of Finance to actively shape and drive the agenda on climate change, an ability that is

necessary to drive action at the pace and scale required and to enable and empower other agencies through fiscal policy and the budget.

When defining the mandate of the Ministry of Finance it can be helpful to articulate the business case for their leadership on climate change. As part of this, it is important to highlight the need for the whole-of-government approach and collaboration with ministries of environment, economy, trade, industrial strategy, central banks and other actors, along with the importance of addressing climate financial risks, and the economic and competitiveness aspects related to climate action.

Where there is a clear mandate, there is authority to act. Mandates on climate change for Ministries of Finance help ensure there are resources, expertise and capital. **Denmark** provides an example of clarifying their mandate to include climate more explicitly (see Box B14 and below). A mandate could come from legislation or from the government's program. It could also be initiated by the leadership of the Ministry through an internal strategy on climate change, although this might not be sufficient to formalize the Ministry's role or obligations as part of overall climate governance. In the face of competing priorities due to the current multiple crises, there are opportunities to bring competing current agendas together, for example to co-tackle the costs of living, energy and climate change.

Box B13. Drivers for increased leadership on climate change by Ministries of Finance—examples

Several government officials interviewed for this report noted that changes in their commitment to climate change in the Ministry of Finance occurred following: a change in government or a shift in the current government's approach to climate change; the adoption of legislation; or an appointment of a new Minister who exercised personal leadership in bringing climate onto the Ministry's agenda.

While the **US** Treasury has long been actively engaged on climate issues, the creation of the Climate Hub and appointment of a Climate Counselor reflected a heightened emphasis on climate change, plus the Treasury's key role in the Biden Administration's whole-of-government approach to climate change.

In **Germany**, the adoption of a climate law in 2019 shifted the debate. The climate law sets national and sectoral goals for every year reviewed, which if not met means the government must set up a new program to catch up and get back on track. This has focused the attention inside the government and in the Ministry of Finance specifically on the delivery of climate objectives.

In the **UK**, the government's Net Zero Review has been important as a reference point in making the case for how the transition is integral to the broader economic strategy as the UK decarbonizes. It considers the potential exposure of businesses and households, highlighting factors to be taken into account and some of the fiscal risks from inaction, and begins to consider climate in a framework that is about managing fiscal risk over time and achieving economic growth in a competitive environment.

In some cases, natural disasters are increasingly acting as a driver to increase commitment by governments and strengthen the case for leadership by Ministries of Finance on climate action. For example, in the **Bahamas**, hurricanes that damage the islands also reduce the fiscal space significantly while the country is trying to recover. The government recognized that by implementing preventative measures it can reduce the fiscal burden, highlighting the importance of engaging the Ministry of Finance. Disaster risk finance and the notion of significant fiscal impacts from disasters have been among key drivers for the increased attention to climate change in the Ministries of Finance in **Jamaica**, **Malaysia**, **Uganda** and other countries.

Source: Interviews conducted for this report

In countries lacking sufficiently strong top-level drive for the Ministry of Finance to engage on climate, the Coalition of Finance Ministers can play a key role by showcasing examples of what other Ministries of Finance are doing and why the climate agenda should be taken seriously.

Real world examples

- **A growing number of Ministries of Finance are explicitly introducing changes to their core mandate on climate change,** either in a top-down way, following an adoption of a climate law (e.g. **Denmark**), as a result of a governmental regulation requiring integration of climate concerns into the operations of all relevant agencies (e.g. **Ireland**), or through the commitment by the head of state (e.g. **Bahamas**). In other cases, the shift in the level of priority attached to climate change has happened due to personal leadership by the Minister of Finance (e.g. **Malaysia**).
- In **Uruguay** the mandate for the Ministry of Finance has been changed through the budget law to explicitly mention that the Ministry is going to work on mainstreaming climate change and refers to the Helsinki Principles.
- **Finland's** Ministry of Finance adopted a climate and nature strategy in December 2022, which communicates the intentions and principles it will emphasize when preparing climate and nature policies in the future. While the necessary operational and governance-related matters remain to be defined, the strategy sends a signal that these issues will be a core part of the Ministry of Finance's activities in the future. The Ministry is not a member of the Climate and Energy Policy Group, which is led by the Minister of Environment, and therefore needed to find a different way to address climate issues proactively.
- **Peru's** Ministry of Economy and Finance has the legal mandate to harmonize national economic activity. The Ministry identified that climate change is a negative externality that may affect that harmony, due to its impact on the wellbeing of the population, so it increasingly engaged in the development of policies aimed at combating the effects.[50]

Box B14. Denmark: Reforming the vision and mission of the Ministry of Finance to drive whole-economy climate action

In 2019, the Danish government reached an agreement on a new Climate Law with broad majority support in the Danish Parliament. The law set a binding target to reduce greenhouse gases by 70% by 2030 (relative to 1990 levels) and to reach net zero emissions by 2050 at the latest. Danish Minister of Finance Nicolai Wammen made clear that delivering on the 2030 climate target demanded that the Ministry of Finance take on a stronger role:

> *The climate ambition that the government has set means that we are facing one of the biggest socioeconomic changes since we expanded the welfare state in the early 1960s. That is why we need to think of the green transition as an integral part of economic policy...*
> *The Ministry of Finance must play a much stronger role when it comes to the climate effort, and both the ministry and the Minister of Finance must be able to do more than we can now. We must be a green main engine in society, so that the green transition is not just something that lives in the traditional green ministries. Otherwise, we will not reach the finish line.* (Nicolai Wammen, quoted in Danish newspaper Berlingske, 19 Oct 2020)

[50] Some case studies provided by Molly Caldwell and Natalia Alayza (WRI)

Several concrete initiatives in the Ministry of Finance followed this top-level political direction. The mission statement that sets out the overall strategic direction of the Ministry's activities was adapted to include sustainable climate and environmental development as a top-level objective, along with traditional fiscal and economic priorities (the change made to the original statement are shown in bold):

> *The Ministry of Finance provides the government with the best possible basis for pursuing a sound economic policy that strengthens growth and productivity, streamlines the public sector* ***as well as promotes a sustainable climate and environmental development.***

For more detail on the related governance changes implemented in Denmark to fulfill the mission, see the respective case studies in the sections on governance and coordination below.

Source: Prepared by the Danish Ministry of Finance

Capability 1b. Developing organizational climate strategies

Context and role of Ministries of Finance

Internal strategies on climate change can help Ministries of Finance operationalize their overall mandate into a set of concrete objectives and actions required to support them. A growing number of Ministries of Finance are developing and adopting organization-wide climate strategies. Two surveys conducted by the Helsinki Principle 2 Working Group show that by 2021, 15 Ministries of Finance had dedicated climate strategies in place, up from six in 2020 (Coalition of Finance Ministers for Climate Action, 2022g). Ministries of Finance so far have chosen to publish dedicated climate strategies (e.g. Chile), or to integrate climate objectives into their overall strategies (e.g. Ireland), or a combination of these (e.g. US). While having a separate strategy enables the inclusion of more detail, the plan needs to be aligned with and reflected in the Ministry's overall priorities.

Formalizing and publishing a climate strategy can serve several purposes, including:

- Setting out internal priorities and creating internal buy-in for the objectives and actions.
- Designating responsibility for coordination and delivery of climate change-related work internally.
- Signaling the Ministry's commitment and role in the overall climate governance, priorities, division of responsibilities to other departments and stakeholders, including the private sector, thereby clarifying institutional arrangements on climate change (if externally available).
- Determining the necessary capabilities needed to meet the objectives set out in the strategy and outlining a plan in how they will be built internally and through external partnerships (see also Capability 3).

Ministries of Finance developing dedicated climate strategies, or integrating climate into their ministerial strategies, should consider addressing the following elements:

- **Overall vision on climate change:** include details on the Ministry's vision and how it aims to support the broader government climate agenda and aims to contribute to national climate targets.
- **Case for action:** highlight the key challenges and opportunities of climate action.
- Strategic priorities and desired outcomes: include an accompanying list of actions and measurable indicators of success.
- **Overview of relevant stakeholders:** consider stakeholders both inside and outside government, and outline how coordination will be carried out and who will be responsible at the Ministry.

- **Assessment and plan for capacity and resourcing needs:** include an assessment of required and existing skills and capacity gaps, and identify a plan for augmenting capacity (see Capability 3).
- **Internal governance or institutional arrangements:** determine how capacity to address climate change would be organized and where it would be located internally; and identify mechanisms for internal and external collaboration.

Ministries of Finance can also use internal strategies to set out how they plan to ensure the sustainability of their own operations. Ministries should lead by example by considering how their own operations and services impact and are impacted by climate change and work toward reducing those impacts. Efforts should include measures such as increasing the use of low-carbon energy, using electric vehicles, ensuring that buildings are constructed and renovated following high environmental standards, and putting in place policies for green public procurement to encourage goods, services and works with a reduced environmental impact. Such efforts will not only help Ministries of Finance achieve their government's climate targets but can also generate substantial cost savings (see Function 2e on green public procurement).

Targets and plans for greening Ministries of Finance operations can be included in ministerial strategies. For instance, the US Treasury Strategic Plan 2022–2026 includes a sub-objective on 'Sustainable Treasury Operations', which sets out how the Treasury aims to reduce greenhouse gas emissions and reduce climate impacts from its own operations (see more below). To exchange information and share best practice on greening government operations, Finance Ministers, through their governments, can join the Greening Government Initiative. This global effort, launched by the US and Canada in 2021, serves as a way to communicate practice around greening government operations.

Real world examples

A growing number of Ministries of Finance have integrated climate change into their ministerial strategy. For example:

- In **Ireland**, one of the Department of Finance's five strategic goals in its Statement of Strategy 2021–2023 is "promoting environmentally sustainable economic progress." The goal includes three actions: 1) the development and promotion of economic, fiscal and financial policy advice in support of the government's policy on climate action and climate finance; 2) participation in relevant work streams of the Coalition of Finance Ministers for Climate Action; and 3) the development and implementation of policies to further develop Ireland's sustainable financial services sector, with accompanying outcomes and performance measures.
- In **New Zealand**, 'Navigating climate change' is one of the strategic priorities outlined in the Treasury's Strategic Intention 2021–2025.
- In **Finland**, the Ministry of Finance's strategy published in March 2022, titled 'The Ministry of Finance secures future prosperity', defines its strategic goals as "build[ing] an economically, ecologically and socially sustainable Finland and European Union" and explicitly references climate and biodiversity loss. The Ministry has also published a dedicated climate and nature strategy (see above), which communicates the Ministry's responsibilities and which principles it will emphasize when preparing climate and nature policies.

Some Ministries of Finance already have dedicated climate strategies in place that provide more detail on priorities and planned activities. For example:

- **Chile's** Financial Strategy on Climate, published in 2019, highlights the role of the Ministry in the national climate agenda and sets out an action framework aligned with the Paris Agreement to be delivered through the NDC, "with a view to carbon neutrality." It outlines progress to date and short-term priorities for action

under three pillars: 1) information generation and data analysis under a coherent framework to mobilize capital flows; 2) promotion of economic and financial instruments and market development; and 3) strengthening green finance. It also discusses the role of the Ministry of Finance in the broader climate governance structure.

- The **US Treasury** has a strategic plan that prioritizes climate action and an internal Climate Action Plan that discusses greening the department's internal operations. The Treasury Strategic Plan contains four objectives under the goal of "combat[ing] climate change": 1) global climate commitment and leadership; 2) climate incentives and investment; 3) climate-related financial risks; and 4) sustainable Treasury operations. The latter point sets out how the Treasury plans to improve its overall sustainability and invest in the department's adaptation and resilience efforts to address climate change impacts on operations and services, including through procuring 100% renewable energy and 100% electric vehicles and through setting up a climate literacy program for its staff. The Climate Action Plan provides more detail on the Treasury's five priority action areas to strengthen its climate resilience and adaptive capabilities.

Capability 1c. Formalizing governance structures and organizational set-up

Context and role of Ministries of Finance

Strengthening Ministry of Finance engagement on climate change can be accelerated by reforming internal institutional and legal arrangements: it is especially important to ensure dedicated internal capacity for climate change issues within the Ministry of Finance and its continuity over time.

Different institutional approaches are emerging, depending on the available resources and the mandate of the Ministry of Finance. At the minimum, a Ministry of Finance needs to have designated and qualified staff who consistently act as focal points on the issues related to climate change, decarbonization and climate resilience. Smaller Ministries of Finance or those with resource constraints have been identifying existing staff with relevant expertise and adjusting their responsibilities to introduce climate change. Where resources allow, and in half of the Ministries interviewed for this report, Ministries of Finance have been creating dedicated climate units combining redeployment of existing staff and recruitment of new experts (see examples of Ireland, Fiji and Denmark below). Some countries take a hybrid approach of creating a small climate change team that coordinates engagement of relevant expertise across the Ministry of Finance (e.g. the US Climate Hub).

Dedicated climate change teams at Ministries of Finance may serve a variety of functions and the combination of functions covered will vary. The team can serve as an advisory unit within the Ministry and sometimes for the government as a whole, to develop, coordinate and propose much of the content of climate change-related policy reforms. It can also serve as a coordinating unit or focal point on climate change, working with other departments within the Ministry and with external partners to channel enquiries related to climate change and ensure follow-up. It may have a responsibility for engaging internationally. These teams can also act as knowledge hubs that generate and transfer capacity on climate change through the Ministry via provision of training, internal collaborations or short-term placements of staff. The real-world examples outlined below reveal that larger dedicated units tend to have a hybrid role and fulfill most of these functions, while smaller teams often prioritize coordination and focal point roles.

To avoid significant gaps and duplication and to ensure capacity is deployed effectively, Ministries of Finance need to assign clear responsibilities for the key areas of work related to climate change. It is important to determine where such internal capacity would be located institutionally and what arrangements would be put

in place for effective interaction with the rest of the Ministry. Rather than an optional add-on to existing duties, addressing climate change should be a core responsibility of the designated staff and reflected in workplans and performance reviews. Designating responsibility for climate change improves institutional clarity and continuity and enables commitment of resources within Ministries of Finance.

Effective processes for internal and external collaboration on climate change are essential to tap into relevant expertise and knowledge distributed among many internal teams at the Ministry of Finance and external institutions and stakeholders. For instance, the **German** Ministry of Finance organizes a regular 'climate café', where all staff working on climate issues meet to discuss their work. The **US** Treasury sends out weekly emails to all staff to keep them informed about the latest climate developments. Similarly, internal governance arrangements should ensure easy access to centralized climate-related expertise (see Capability 3). For example, some OECD countries divide responsibility for issues related to domestic and international climate-related finance between different teams. It is important that there is close collaboration between such teams and the rest of the institution, not least as experience gained with policies related to climate change are highly valuable for development finance teams, and vice-versa.

Real world examples

Establishment of dedicated climate change units, as observed in several Ministries of Finance, has helped create internal capacity and increase overall awareness among staff, and enabled better coordination and more effective responses to climate change.[51] For example:

- **Denmark's** Ministry of Finance set up a dedicated Centre for Climate, Green Economy and the EU by merging several existing teams and adding additional staff, with a primary focus on policy development and coordination. It has also built the capacity of other relevant internal teams to work on climate change and engaged external experts (see Box B15).
- **Fiji** in 2017 set up a Climate Change and International Cooperation Division (CCICD) in the Ministry of Economy. Despite resourcing challenges, CCICD has spearheaded many of the country's flagship initiatives on climate change (see Box B16).
- **India** created a Climate Change Finance Unit within the Department of Economic Affairs of the Ministry of Finance in 2011, as part of institutional efforts to increase climate finance. The unit's primary purpose is to serve as the focal point of the Ministry on all matters related to climate finance, participate in international negotiations, and provide technical input to the national climate policy framework.
- In **Ireland** the Department of Finance established a dedicated Climate Unit in 2020 in response to the requirement of the Programme for Government 2020 for each minister to direct the agencies under their responsibility to support climate action. Climate issues are now increasingly mainstreamed across the Department's policy areas, with the unit providing strategic oversight of climate action. It has coordinated input into the national Climate Action Plan and its legally binding target of reducing greenhouse gas emissions by 51% relative to 2018 by 2030, and more recently the first program of carbon budgets and related sectoral emissions ceilings. The unit is set to manage engagement with and input into the update of the Climate Action Plan. With a view of building engagement across the Department, in 2022 the unit set up a senior-level internal Climate Economy Group, which is assisting in increasing awareness and capacity on climate issues across different policy areas.
- In **Chile** the Ministry of Finance has been working on green finance for several years and the intensification of this work led to the establishment of a Green Finance Unit in 2022, in charge of: driving investments into green assets; promoting national financial innovation to support the sustainable development trajectory, reduced emissions and strong resilience to climate change; advising other government agencies on sustainable development and climate finance, mitigation and adaptation instruments and other issues related

to sustainable finance; relationships with multilateral agencies, organizations and institutions working in sustainable development and climate finance. This has improved coordination on sustainable finance issues internally and with other agencies. Chile was the first country to issue sovereign green bonds in the Americas and the first in the world to issue a sustainability-linked sovereign bond, which was executed by the Public Debt Office at the Ministry of Finance.

- In **Uganda**, to support a whole-of-government approach to managing climate risks as part of economic policy, a climate finance unit has been established within the Ministry of Finance, Planning and Economic Development. It is intended that this unit will coordinate the Ministry's action and liaison on climate with other government ministries and agencies. The unit will host the different climate-related analysis tools that will be used by the Ministry of Finance and other agencies. It will explore financing possibilities to ensure climate strategies are reflected in national planning frameworks and budgets. The unit will also continue to work to reduce the cost of climate financing; for instance through an initiative of removing intermediary agencies, as being piloted under the LDC Initiative for Effective Adaptation and Resilience.

Box B15. Denmark: Creating capacity to address climate change in the Ministry of Finance

Following the adoption of a new Climate Law in 2019, which sets a binding target to reduce greenhouse gases by 70% by 2030 below 1990 levels and to reach net zero emissions by 2050, the Danish Minister for Finance announced that it required a stronger role for the Ministry of Finance.

Internal capacity

The Ministry set up new a dedicated Centre for Climate, Green Economy and the EU by merging the Ministry's Division for Energy, Climate and Environment with the Division for EU Policy and Budgetary Issues and adding additional staff. The Centre brings together staff covering budget and fiscal policy and broader policy development and coordination on domestic, EU and international climate, energy and environmental issues with the aim of taking on a more horizontal, proactive and forward-thinking role on green policy analysis and development. The Centre has around 25 dedicated full-time staff.

In parallel, other divisions in the Ministry of Finance have stepped up engagement on climate-related issues. For example, the Division for Tax Policy and Capital Markets played a leading role in preparing the analytical groundwork for Denmark's Green Tax Reform adopted in the summer of 2022 and the development of Denmark's Green Bond Framework and issuance of green bonds in February 2022. The Centre for Competition, State-owned Enterprises and Utilities is engaged in improving guidance on climate aspects of socioeconomic policy impact assessment along with the development of large-scale offshore wind projects called 'energy islands'. The Centre for Macroeconomic Policy delivered the foundation for a political decision to create a dedicated green fiscal space of more than €7 billion toward 2040, reserved for green public investment.

Using external experts to develop policy input

The government established two commissions of external experts to provide analysis and develop proposals for new green polices: an Automobile Commission providing proposals for the decarbonization of road transport, and a Green Tax Reform Expert Group that produced the analytical foundation for the recently adopted carbon taxation reform. The Ministry of Finance served as secretariat for both commissions, which helped build internal insight and capacity on key issues and to successfully negotiate political agreements based on the commissions' proposals.

Source: Prepared by the Danish Ministry of Finance

Many of the dedicated teams created to work on climate change within Ministries of Finance are quite small. For instance, Chile has two full-time staff focusing on climate finance issues and several other staff members who dedicate part of their time to sustainable finance issues; this compares to comparably larger teams in Denmark and Germany (around 25 and 10 staff, respectively). The Department of Finance in Ireland has around five staff primarily working on climate change, out of a department of several hundred. Coordination with the rest of the Ministry can be a critical challenge but is also imperative in order to deliver on the climate agenda.

A hybrid approach can be used as an alternative to a dedicated unit: a designated small team would coordinate work on climate change with much of the work done within existing teams. For example:

- The **US** Treasury has implemented such a hybrid approach by creating a Climate Hub of four staff that primarily serves to set and coordinate strategy, ensure forward progress with respect to the Treasury's climate mission, and represent Treasury's climate priorities externally. The Climate Hub draws on expertise and implementation capacity across Treasury's various offices (see Box B17).
- **Peru's** Ministry of Economy and Finance (MEF) initially relied on the disparate efforts on climate change of various directorates. It was deemed necessary to have a focal point to coordinate environmental and climate-related affairs at the national and international level, and to provide technical assistance in these areas. Rather than creating a specific climate change unit, the MEF added relevant functions to an existing department and hired specialized staff. As a result, the MEF's General Directorate of International Economic Affairs, Competition, and Productivity (DGAEICYP) has incorporated into its functions the promotion of efficiency in the allocation of resources and the internalization of negative externalities to promote sustainable growth, the design of policy guidelines related to environmental protection and management, and climate change mitigation and adaptation. DGAEICYP is also the national designated authority to the Green Climate Fund.[52]

Box B16. Fiji: Ministry of Economy driving climate action—successes and challenges

In 2017, as Fiji started to recover from the previous year's Tropical Cyclone Winston—the most severe cyclone ever recorded in the South Pacific—the Ministry of Finance changed its name and focus and became the Ministry of Economy to reflect its comprehensive mandate to ensure the economic sustainability of the country. In this process, the climate change division of the Ministry of Foreign Affairs was transferred to the Ministry of Economy and was renamed the Climate Change and International Cooperation Division (CCICD). The restructure embedded climate considerations into decisions about economic policy, budget planning and allocation, and international assistance.

Institutional challenges

The limited expertise, staffing capacity and technological prowess that have long faced governing institutions in Fiji also apply to the CCICD. The division has almost as many climate-focused embedded consultants (10) as it has full-time staff (12). The full-time staff are often asked to lead, execute, coordinate and inspire Fiji's climate action. They also coordinate, approve, provide guidance to, and manage the work products of the more than four dozen publicly funded development partners. Most of the staff are recent graduates who move on to other jobs within five years—often to international development partners—meaning the entire team turns over within the same timeframe. This hinders the institutionalization of knowledge and processes the team develops. However, although the CCICD is routinely under-resourced, it has more climate expertise and dedicated staff

[52] Case study provided by Natalia Alayza and Molly Caldwell (WRI).

capacity than its potential counterparts at the line ministries. The Climate Change Act calls for sector ministries to establish a climate focal point to liaise with the CCICD on climate-related issues. At the time of writing, four of the 18 sector ministries had formally established this focal point.

The CCICD has spearheaded many of Fiji's most innovative climate actions, including:

- **Launch of the Fiji Green Bond.** In October 2017, Fiji raised FJ$100 million (US$50 million) to fund climate action, becoming the first developing country to structure and launch a green bond on the London Stock Exchange. The CCICD was instrumental in coordinating among the Fiji Reserve Bank, the World Bank Group, and the Ministry of Economy to design, issue and launch the bond.
- **Upcoming blue bond issuance.** With technical support from UNDP, the CCICD is set to issue Fiji's first sovereign blue bond in 2023. The goal of the issuance is to catalyze a COVID-19 recovery that reignites Fiji's fisheries sector, advances low-emission shipping and marine transportation, fortifies Fiji's sustainable tourism brand, and enhances its waste management value chains.
- **Enactment of the Climate Change Act 2021**. The CCICD was instrumental in designing and passing this legislation, which commits Fiji to: 1) providing for the relocation of at-risk communities and safeguarding their rights; 2) setting a net zero emissions target for 2050; 3) setting the legal framework to enable carbon sequestration, carbon stocks and emission reduction projects; 4) charging relevant agencies to conduct risk assessments and to decide on new infrastructure approvals based on resilience estimates; 5) making provisions to implement sustainable financing.
- **Relocation trust fund and Planned Relocation Guidelines.** Locked-in climate impacts make relocation in Fiji a question of when and how, not if. In response, the CCICD has established the Planned Relocation Guidelines, which detail the processes for ensuring that relocation efforts are handled in a transparent, inclusive and community-driven manner. Additionally, the CCICD launched the Climate Relocation of Communities (CROC) Trust Fund to attract bilateral and multilateral financing for planned relocation efforts and complement Fiji's own financing for the trust fund.
- **COP23 Presidency (2017) and international climate advocacy.** After leading the push in Paris to include the 1.5°C target, Fiji has remained a powerful voice on the international climate stage. It was the first small island nation to serve as COP President, in 2017, and has continued to elevate issues around Loss and Damage and the ocean–climate nexus, which are vital for small island countries.

Source: Contribution by Caitlin Smith (WRI)

Opportunities for action

Ministries of Finance should establish clarity around their top-level political priorities on climate change, communicate them internally and to external stakeholders, and mobilize capacity internally through setting clear institutional arrangements and responsibilities on climate change.

In particular, Ministries of Finance should consider:

- **Developing an explicit mandate with respect to driving climate action.** A change in mandate could come from climate change or budget legislation, from the government's program, or be initiated by the leadership of the Ministry through a mission statement or an internal strategy on climate change. It can be done through modifying the current mandate or overall strategy to reflect climate-related priorities.
- **Developing and publishing an internal strategy on climate change**, operationalizing the overall mandate into a set of concrete objectives, internal priorities and actions, role of the Ministry of Finance in overall climate governance, and internal institutional arrangements to support delivery of climate action.
- **Designating clear responsibilities for coordination and delivery** of climate change-related work internally, and collaboration and coordination with other departments and stakeholders.
- **Determining the necessary capabilities** needed to meet climate change objectives and outlining a plan in how they will be built internally and through external partnerships.
- **Making plans for ensuring the sustainability of their own operations** and including these plans into their climate change strategies.
- **Reforming internal institutional arrangements** to ensure dedicated internal capacity for climate change issues within the Ministry of Finance. This includes:
  - Setting up effective processes for internal and external collaboration on climate change to tap into relevant expertise and knowledge distributed among many internal teams and external institutions and stakeholders.
  - Ensuring assignment of clear responsibilities for the key areas of work related to climate change and avoiding gaps and duplication.
  - At the minimum having designated and qualified staff who consistently act as focal points on issues related to climate change, decarbonization and climate resilience.
  - Where resources permit, establishing a dedicated climate change unit combining redeployment of existing staff and recruitment of new experts. Alternatively, designating a small team dedicated to coordinating work on climate change, with much of the work being done within existing teams.
- **Seeking opportunities to capitalize on synergies in addressing competing priorities** due to the current multiple crises (e.g. energy, climate and cost of living), and coordinate with other agencies on a unified response and communication across government and to external stakeholders and the general public accordingly.

Box B17. United States: Delivering through a small Climate Hub at the Department of Treasury

In April 2021, the US Secretary of the Treasury established the Treasury Climate Hub within the Office of the Secretary at the department and appointed its first ever Climate Counselor. The Climate Hub operates as a small unit of four staff, serving to set and coordinate strategy, ensure progress with respect to Treasury's climate mission, and represent Treasury's climate priorities externally. The Hub draws on expertise and implementation capacity across Treasury's various offices. The Hub has demonstrated that a small and nimble senior-level function can play an important strategic, coordination and communication purpose while advancing and implementing a robust climate agenda within a Ministry of Finance. The Hub has worked with teams across Treasury to enable and expedite the net zero market transition while helping to ensure the resilience of the financial system to climate-related risks.

The Climate Hub provides cross-departmental coordination and consistency. Many of Treasury's policy offices are actively engaged in ongoing climate-related workstreams. Because climate change is a crosscutting challenge, the Hub collaborates with Treasury's policy offices to help ensure that the department's full expertise and capabilities are brought to bear on key priorities:

- The **Office of International Affairs** leads Treasury's international engagement, including: climate finance negotiations; MDB climate policy; environmental trust fund oversight; Just Energy Transition Partnerships; multilateral forums such as the G7, G20, Financial Stability Board, and Coalition of Finance Ministers for Climate Action; climate finance-related trade policy; and multilateral sustainable infrastructure initiatives.
- The **Office of Domestic Finance** leads Treasury's climate-related work with respect to the US financial system, domestic community investment programs, federal fiscal and accounting operations, and engagement with the insurance sector and state and local governments. It also includes the Financial Stability Oversight Council (FSOC) Secretariat, which is coordinating among FSOC member agencies to advance the recommendations in the FSOC's 2021 Report on Climate-Related Financial Risk.
- The **Office of Tax Policy** leads the development and implementation of climate- and clean-energy-related tax policies, including those in the Inflation Reduction Act of 2022, which makes the largest investment in addressing climate change in US history.
- The **Office of Economic Policy** leads on technical analysis of climate- and energy-related policies and supports the integration of climate in the development of the President's budget projections.
- The **Office of Management** is working to ensure that Treasury's facilities and operations are resilient to the effects of climate change, including extreme-weather events. It is also charged with procuring EVs to reduce Treasury's fleet emissions.

The Hub helps to set the strategic direction of Treasury's climate-related work and identifies opportunities to raise climate ambition. The Climate Counselor regularly convenes senior leadership and climate experts to identify medium- and long-term climate priorities and to continually assess progress on these priorities. The Hub also leads on workstreams that require intensive cross-departmental coordination (e.g. on enhancing the impact and accountability of private sector net zero commitments), and participates in workstreams that require consistent senior-level engagement (e.g. the Just Energy Transition Partnerships).

The Hub helps represent Treasury's climate priorities and activities across the government and with external stakeholders. It assists with supporting and coordinating engagement in interagency processes and seeks opportunities to elevate Treasury's public voice on climate through public speaking engagements.

Source: Prepared by the US Department of Treasury

Capability 2. Coordination and collaboration for whole-of-economy climate action

Helsinki Principles 2 and 4

This section discusses the importance of ensuring a whole-of-government approach to climate change in which Ministries of Finance play a central role, and the need to develop collaborative relationships between Ministries of Finance and key line ministries.

Context and role of Ministries of Finance

Climate change requires societal and economic transformation at a scale that is beyond the remit of individual line ministries and sectoral policies. Climate change is a 'horizontal' issue, in that it covers all sectors of the economy, nearly always with significant economic and fiscal impacts and trade-offs.

Public sector stakeholders often struggle to solve complex and fragmented problems, referred to as 'wicked problems' in contemporary public policy studies (Head, 2022). Strong coordinating capabilities are needed to address such complex issues. Coordination capability refers to the ability to bring together many different entities and align their efforts to accomplish goals that go beyond those of individual system players (Neby, 2019); it represents willingness to work together (Singh, 1991). In this context coordination necessitates that an institutional unit attempts to consider what other departments are doing. Climate change is a 'wicked issue' affecting a range of government functions across sectors and industries, requiring policymaking that is coordinated across departments and levels of authority to align efforts with accomplishing national climate goals (Pollitt, 2015).

Cooperative and coordinative efforts are key tools for solving a policy challenge as complex as climate change (O'Leary and Blomgren Bingham, 2009). The unified response required demands coordination between government and other stakeholders including NGOs, central banks, financial institutions and the private sector, as well as across government.

Ministries of Finance already play a key role in stewarding sound economic development and handling the prioritization of differing government objectives. Most importantly, they lead on the budget, a central whole-of-government coordination process tying together all government actors and actions (ODI, 2016; see Function 2a). This role can be utilized to strengthen government coordination and cooperation on climate challenges.

Effective climate coordination is crucial to successful implementation of national climate objectives and requires engagement of multiple stakeholders across policy areas and sectors. Inter-ministerial coordination among the Ministry of Finance and line ministries is particularly important to avoid duplication of tasks, identify and bridge potential policy gaps, and improve sectoral line agencies' acceptance of climate change objectives and key policies. It also enables relevant expertise that is spread across agencies to be built upon.

> *The role of Ministries of Finance moving forward will be crucial in trying to bring all this together, yet without stepping on the toes or stepping into the domain or territory set by others. So, it really is an issue about collaboration.* (Interview with Ministry of Finance official from a developing country)

Most countries establish formal coordination mechanisms on climate change, which often take the form of inter-ministerial commissions or climate councils, with representation of the key ministries relevant for climate action.

Coordination bodies sometimes also include representation of subnational governments and certain non-state stakeholders. Some are presided over by the head of state, or report directly to them, which gives the body greater prominence and political backing. Others are chaired by the ministry responsible for climate change. Regardless of the institutional form, it is important that Ministries of Finance take an active role in coordination on climate change and help ensure it has political backing. Furthermore, the budgeting process offers a powerful coordination tool and an opportunity for the Ministry of Finance to exercise leadership on climate change in working with other ministries.

Coordination and collaboration with non-governmental stakeholders, such as civil society, the private sector and the international finance and expert community, are critical for improving the quality of and support for climate policy proposals. This can also help fill internal knowledge and capacity gaps at Ministries of Finance (see Section C3). Such coordination and collaboration can happen, among other ways, through consultations on policy design, input into policy proposals, knowledge development partnerships and joint pilot projects.

Appendix 3 provides an overview of key areas for collaboration and coordination with both governmental and non-governmental stakeholders.

All the areas outlined in this framework require active collaboration between Ministries of Finance and other actors. This includes the key functions related to national development and climate strategies, investment planning, macro and fiscal policy, financing, and the other key capabilities.

Barriers to action and ways to overcome them

Collaboration and coordination on climate change are challenged by several issues, some of which relate to the nature of climate change itself, including the complexity and uncertainties involved, divergence of interests of the actors in policy development and implementation, and disparity between the resulting policies (Averchenkova et al., 2019). Other challenges concern political mandates, governance processes and internal capacities.

Some of the most prominent challenges facing Ministries of Finance include:

- **Lack of horizontal policy alignment.** There is often a disparity between climate change goals and the objectives specified in strategic documents that set out the economic development agenda. This can create a systemic issue of lack of alignment and policy coherence. Many current national policies have their genesis in or remain centered on carbon-intensive activities and fossil fuels, which have long supported economic growth. Revision of current priorities and policies and integration of climate change concerns into economic development plans requires effective coordination between the Ministry of Finance, key line ministries and offices of the President or Prime Minister.
- **Ambiguity of mandates.** Sometimes leadership on and distribution of responsibilities for climate change among agencies is not fully clear, due to ambiguities in domestic climate governance arrangements. Many experts from the Ministries of Finance interviewed for this project highlight the potential overlap between line ministries and the climate change team in the Ministry of Finance as one of the key challenges for coordination. Such overlap or ambiguity of mandates or work plans creates potential institutional conflicts about which institution is entitled to make decisions. Clarity is needed on who oversees each thematic area, the specific mandate of the Ministry of Finance, and how the coordination relationship would be managed, and what happens if various bodies or committees disagree (see Capability 1).
- **The Ministry of Finance is often not at the table or not engaged in a meaningful way when key climate strategies and policies are being developed.** In some countries the Ministry of Finance is not a part of or an active member of the inter-ministerial coordination mechanism on climate change. Often the Ministry of Finance is a 'gatekeeper' rather than a central player, as it signs off on the budget and financial matters. For example, in Finland, until recently the Ministry of Finance was part of the ministerial group that prepares national climate scenarios but it was not a member of the inter-ministerial group working on climate strategy.

- **Mistrust of public–private engagement.** While engagement of Ministries of Finance with private sector stakeholders on climate-related policies is very important, the track record of public–private relationships on climate is mixed. In some countries the private sector has been reluctant to engage in a meaningful way in climate policy consultations due to skepticism and general mistrust in public bodies, problems with previous interactions not leading to constructive feedback, and concerns about the direction, scope and nature of climate policies (Averchenkova et al., 2019). Often the lack of feedback loop both within the public sector and between the public and private sectors, civil society and academic community makes coordination of the climate response challenging and leads to inconsistencies and discrepancies in policies and delays in necessary responses.
- **Insufficient priority and resource given to coordination on climate change.** This could be on behalf of either the Ministry of Finance or the line departments and impedes meaningful interaction and inputs, resulting in a lack of ownership over policy proposals and having detrimental impact on their quality. These challenges may stem from a lack of commitment among the leadership of the relevant department and/or a lack of clear institutional mandate on climate change. Limited internal capacities of the Ministry and a lack of designated focal point for coordination are other possible factors (see Capabilities 1 and 3).
- **Insufficient coordination on international financing and funding requirements.** In many countries the Ministry of Finance screens all requests and proposals for international finance before financing is approved. As part of this, the Ministry assesses whether there are different requirements from other agencies that can be streamlined so there is no duplicated or overlapping work. If line agencies have their own priorities on climate change and there is no coordination, a country may end up having disparate approaches in different sectors. This creates challenges for financing: for example, if a government wanted to issue a green infrastructure bond it could find this difficult if there were no single set of documents that addressed how to approach climate change and sustainable finance.

> *Even though the Ministry of Finance are part of the consultations on climate change strategies, part of the trainings, part of the capacity development events, it's a very superficial role, just as a guest, and you cannot have the Ministry of Finance as a guest [to the] climate agenda.* (Interview with Ministry of Finance official from a developing country)

Many coordination challenges can be addressed by clarifying mandates among the different agencies and adapting the mandate of the Ministry of Finance to include climate action. Developing an internal climate change strategy that sets out the role, workplan and mechanisms for internal and external collaboration for the Ministry of Finance can help further (as described above in Capability 1). For example, the successful implementation of the net zero transition and creation of a common vision across agencies and climate change initiatives must be incorporated into economic development plans and policies, and into long-term strategies.

A mandate for Ministries of Finance, Ministries of Environment and other key line ministries to integrate climate change into national development plans and collaborate with other stakeholders may be added to each ministry's performance objectives and monitoring system. This can help to create ownership for implementing ministries that will translate the strategy into sectoral policies and projects. **Ghana**, for example, demonstrates how the national-level alignment of NDCs and SDG priorities creates a chance to enhance economic development along a climate-resilient pathway, achieved through coordination between institutional and national bodies to avoid misalignment across sectors (Antwi-Agyei et al., 2018).

Having a clear role for and active participation of the Ministry of Finance in inter-agency coordination and collaboration mechanisms on climate change will improve climate policy alignment and coherence and lead to more informed cross-sector policy decisions. This is important to ensure a whole-of-government approach to climate policy. The leadership and convening ability of a lead institution—one that has leverage over others—is important to enable effective collaboration and action. Ministries of Finance have a particularly important role here, given the fact that they have key economic and political tools at their disposal, not least the budget.

Collaboration between the Ministry of Finance, line ministries and other stakeholders also helps maximize mutual capacities and build on joint expertise (see also Appendix 3). Given the limited capacities of each line ministry and the crosscutting nature of climate change, working together enables a tapping into expertise of other ministries and other financial institutions such as national banks, which have strong sustainability teams (see Capability 3). Independent expert advisory bodies on climate change (such as the UK's Climate Change Committee) can further support Ministries of Finance in determining their internal climate strategy and bring a longer-term perspective into analysis and modeling. Furthermore, where independent advisory bodies produce recommendations for the government on targets, policy gaps and progress with implementation, some of those may be directly or indirectly addressed to the Ministry of Finance.

Feedback mechanisms should be introduced into coordination and consultation mechanisms on climate change for interactions with both public and private stakeholders. For example, when holding a policy consultation, it is important for the Ministry of Finance to provide information on how the input received has been treated and to be transparent on next steps. This improves transparency and accountability of the coordination process and helps stakeholders to trust that their input is being considered seriously. Moreover, effective and consistent communication between departments and working groups about concurrent planning initiatives should take place, to avoid inconsistencies and gaps.

> *If we're going to go on this whole nation approach, we would need everyone to be able to come on board and understand their roles in pushing this agenda forward. So again, the best way for that is in language, and that is to not focus too much on the environment … When you're talking to entities that are dealing with the economy of fiscal matters, at the end of the day, the bottom line is always about the nation's fiscal space or financial standing. The biggest hurdle is about translating these issues so that it could be properly understood and taken up across the sectors.* (Interview with Ministry of Finance official from a developing country)

Developing collaborative relationships between Ministries of Finance, Environment, Planning and other key line ministries requires special effort and should be prioritized. This is discussed in Box B18.

Box B18. Lessons for collaboration between Ministries of Finance, Environment and other line ministries

To drive climate action as part of a whole-of-government approach, Ministries of Finance will need to collaborate closely with key line ministries. Ministries of Environment typically hold strong environmental expertise and often lead the inter-governmental climate agenda. As ministries typically in charge of economic development and infrastructure, Ministries of Planning have a powerful role in defining medium-term economic policy and investment priorities.

Historically, collaboration on climate between Ministries of Finance and line ministries has often been fraught. Whereas Ministries of Environment have usually been leading the climate agenda for years, Ministries of Finance have had a more hands-off approach, often limiting their involvement to assessing the costs of policy proposals or plans (Orozco and Jaramillo, 2021). As Ministries of Finance take a more active role, difficulties in the relationship between Finance, Environment and other line ministries often come to the fore. This can be due to an overlap in competencies (whether perceived or real), a lack of coordination and a lack of a common 'language' and objectives. While Ministries of Environment often operate with a long-term view of environmental value, Ministries of Finance traditionally tend to focus on short-term costs and benefits.

Several Ministry of Finance officials interviewed for this project noted that challenges arise with their peers at the Ministry of Environment, particularly when developing economic analysis and incentives for tackling climate-related issues. Ministries of Finance are often brought into processes late on, rather than being involved from the beginning. By contrast, some Ministries of Environment find that Ministries of Finance do not want to engage in processes until they involve money—which is often in the later stages of proposal development processes—and lack continuity of engagement. This leads to situations where Ministries of Finance are perceived by Ministries of Environment as blockers of climate policy proposals. Limited involvement of Ministries of Finance in the first round of NDCs was likely one factor leading to several climate plans failing to be implemented, due to a lack of costed proposals and integration into planning and budgeting cycles (Coalition of Finance Ministers for Climate Action, 2022f).

Developing collaborative relationships with Ministries of Environment and Planning should be a priority action for Ministries of Finance, alongside other major Ministries such as Energy, Transportation, Water, Industry and Housing. Formal inter-agency collaboration mechanisms are key to establishing sustainable modes of collaboration. As highlighted throughout the report, different modes of collaboration exist in practice:

- **Ministry of Finance leadership:** In Denmark, the Ministry of Finance chairs the Climate Task Force, where the Ministry for Climate, Energy and Utilities is a member.
- **Ministry of Environment leadership:** In Chile, the Ministry of Environment is the NDC lead agency, but a strong institutional framework enables the Ministry of Finance to participate throughout the process.
- **Joint leadership:** Uganda established a tripartite arrangement on climate between the Ministry of Finance, Planning and Economic Development (MOFPED), the National Planning Authority (NPA) and the Ministry of Water and Environment (MWE-Climate Change Department).

Further steps Ministries of Finance can take to improve collaboration with line ministries include:

- **Adapting their mandate** to explicitly include climate action and **develop an internal climate change strategy** (Capabilities 2 and 3). Both can provide clarity on roles and responsibilities with respect to other departments and identify areas where collaboration is essential. This can help bring ministries closer by default, by providing a common ground and incentives to align their respective work.
- **Establishing dedicated focal points** in the Ministry of Finance and relevant line ministries, so that staff have clear points of contact.
- **Ensuring early communication and information-sharing, and continuity of engagement.** In one country interviewed for this report, Ministry of Finance officials hold weekly exchanges with their counterpart in the Environment Ministry so that each department is aware of the work happening in the other, and potential disagreements can be scoped early and escalated if necessary. It also enables working relationships to be built between staff. Similarly, another interviewee noted that it is key to "bring other ministries to the table as soon as possible even though we may think that they may not have anything to add at that point."
- **Recognizing differences in backgrounds, relative strengths and constraints.** During interviews, Ministry of Finance officials noted they have more internal capacity and expertise to work on economic issues, whereas staff at the Ministry of Environment have more expertise on climate change. Recognizing such differences can help Ministries of Finance to improve collaboration with Ministries of Environment.
- **Hiring former Ministry of Environment staff**, or staff with a background in environmental economics, ecology or similar can help translate between the different 'languages'.
- **Holding joint seminars, training or informal discussions** is a way to share latest developments on the relevant policy instruments or learning from past projects and to bridge potential differences in expertise, which can facilitate future joint work.

- **Regularly seeking updates on climate finance negotiations** and other related topics under the UNFCCC, providing input and guidance where negotiation strategies might intersect with programs of reform already underway within the Ministry of Finance.

With the right approach, relationships between ministries can improve significantly.

> *For the last two years, the interactions that we've had with the Climate Change division have not just increased but deepened. And I think that's something that we can and should build on.* (Interview with Ministry of Finance official from a developing country)

Source: Prepared by the authors

Real world examples

Ministries of Finance are increasingly engaged in the development and implementation of national climate change strategies and policies through participation in the relevant inter-agency coordination mechanisms. Examples include:

- In the **Arab States**, climate policy is seen as a multi-stakeholder agenda given the acknowledgement of the significant multi-sectoral threat of climate change impacts to economic development and human security. As NAPs and NDCs have become a core part of policy, Ministries of Finance have started participating more actively as members of taskforces and stakeholder consultations. In several countries, Ministries of Finance are members of the NAP preparation committee. However, while there is momentum among the three countries that have completed their NAPs (Kuwait, Sudan and Palestine), only the NAP of Kuwait outlines a clear public sector financing plan and so further progress is needed.[53]
- **Sudan's** Ministry of Finance and Economic Planning is the focal point for NDC implementation in the country. The Higher Council for Natural Resources and Environment and the Ministry of Finance and Economic Planning are working together to mainstream climate into key national systems and processes, mobilize funding for climate action, and coordinate national and international efforts to promote low-carbon and climate-resilient development.
- **Jordan** has already set up an institutional mechanism for NDC implementation and both the Ministry of Finance and Ministry of Planning are actively engaged in advancing the implementation of NDC in the country.
- In the **US** the whole-of-government approach to tackling the climate crisis involves a significant number of climate-related interagency processes. The Climate Hub at the Department of Treasury assists with supporting and coordinating Treasury's engagement in interagency processes (see Box B17).
- In **Uganda** the Ministry of Finance is represented on the three strategic policy committees dealing with climate policy and engaged in the tripartite arrangement between the MOFPED, the National Planning Authority and the Ministry of Water and Environment to improve inter-ministerial and inter-agency collaboration and alignment of climate policies (see Box B19).
- In **Uruguay**, the Ministry of Finance has been a member of the National Climate Change Response System since 2009. This body, coordinated by the Ministry of Environment, develops climate change policies, the LTS and the NDC.
- **Singapore's** whole-of-government policies on climate change are overseen by the Inter-Ministerial Committee on Climate Change (IMCCC). The IMCCC takes a whole-of-nation view to make sure climate change efforts are

[53] Case studies on the Arab States, Sudan and Jordan were contributed by Sujala Pant (UNDP).

comprehensive and coordinated. The Ministry of Finance's role on the IMCCC focuses on ensuring the fiscal sustainability of Singapore's climate change measures, while keeping these measures compatible with national economic priorities and the country's net zero transition. Given finite fiscal resources, the Ministry also plays the role of balancing ministries' competing priorities, sharpening resource prioritization, and identifying and leveraging cross-agency synergies to fulfill the country's climate ambitions. The Ministry of Finance's role in the IMCCC allows the Ministry to take a longer-term view and coordinate with other parts of the government, in recognition that investing in the transition will underpin and foster sustainable economic development.

Box B19. Uganda: The role of the Ministry of Finance in coordinating the national climate response

In Uganda the Ministry of Finance, Planning and Economic Development (MOFPED) plays a central role in ensuring that national climate policy priorities are considered within the national fiscal framework and policy. An institutional framework for climate action was established through the National Climate Change Policy (2015) and comprises a Policy Committee on Environment, a Cabinet Sub-Committee, and a National Climate Change Advisory Committee. The Ministry of Finance is represented on all three strategic policy committees.

To improve inter-ministerial and inter-agency collaboration and alignment of climate policies, a tripartite arrangement between the MOFPED, the National Planning Authority and the Ministry of Water and Environment (Climate Change Department) was formed. The tripartite coordinated approach led the overarching National Development Plan for 2020–25, which includes a chapter on climate change and aims to support alignment of the country's Green Growth Strategy, NDCs and other national climate policies with national development priorities to ensure effective budgeting and implementation.

The Ministry of Finance has also been essential in ensuring climate change is institutionalized into the national public financial management (PFM) system. Some PFM laws and regulations have been reviewed and updated to ensure consistency with national climate policies. For example, the Public Finance Management Act (2015) provides a contingencies fund that can be used to respond to natural disasters and extreme events and be leveraged to support adaptation policies. The Green Growth Strategy has fostered strategic policy reforms such as greening the procurement system to ensure sustainability of government expenditure by integrating social, environmental and economic dimensions into national public sector procurement policy.

The whole-of-government approach to managing climate risks as part of economic policy is supported by a climate finance unit established within the MOFPED. This unit will coordinate the Ministry of Finance's climate change actions and engagement with other ministries and agencies.

Source: Prepared by the Ministry of Finance of Uganda

In some countries the Ministry of Finance plays a leading role in coordinating the whole-of-government response to climate change. For example, in **Denmark** the Ministry of Finance was designated to chair a Climate Task Force at senior official level to develop analysis and prepare and coordinate submissions to the Cabinet committees on major, crosscutting climate policy proposals (see Box B20).

Ministries of Finance are also engaging in collaboration and coordination with line ministries to develop and implement climate-related policies in key sectors. This is especially important when designing major fiscal incentives for these sectors, as outlined in Function 2. Examples include:

- In **Greece**, the Ministry of Finance is collaborating with the Ministry of Environment and Energy and the Ministry of Development and Investment on developing a Sustainable Financing Strategy, supported by the European Commission (DG Reform). A joint Steering Committee, and a joint core Project Management and Technical Team with the participation of all three line ministries, have been formed to coordinate technical support. Systematic inter-ministerial exchanges on sustainable finance-related technical issues are promoting the formation of formal and informal long-term, productive communication channels among line ministries. Additionally, a wide range of stakeholders, including the Hellenic Federation of Industries and the Hellenic Bank Association plus regulatory and supervisory authorities like the Bank of Greece, have been invited to contribute to a consultation process supporting the identification of barriers and opportunities in encouraging the flow of green finance. The project is expected to produce the framework for the Ministry of Finance to lead the implementation of a comprehensive National Sustainable Financing Strategy, which it is hoped will be embraced by all national public and private sector stakeholders and supported by enhanced capacities and expertise within the administration of the three line ministries.
- In **Uruguay** in 2009, renewable electricity generation, renewable energy service providers and manufacturing of renewable energy equipment were declared of 'national interest' to allow renewables to benefit from tax incentives, including income tax reductions for renewable electricity generation, renewable energy service providers and manufacturing of renewable energy equipment, and VAT exemptions for wind and solar power equipment (see Box B4). Several key ministries and agencies, including the Commission for the Application of the Investment Law within the Ministry of Economics and Finance, worked together to design the scheme and evaluate project applications for tax benefits. Similarly, when Uruguay issued its first sustainability-linked bond in 2022, the Ministry of Economy and Finance coordinated the process, working with four additional ministries to inform KPIs for the bond, establish a monitoring protocol for each KPI, and consider how funds might be most effectively disbursed. Uruguay describes the inter-ministerial collaboration as a self-reinforcing, whole-of-government approach, requiring clear communication and data-sharing to achieve progress.
- The **Egyptian** Ministry of Finance led inter-ministerial consultations at the national level, in particular with the Ministry of Foreign Affairs and the Ministry of Environment, to pave the way to launch the Sustainable Debt Coalition at COP27. Prior to COP27, the Ministry of Finance collaborated with the Ministries of International Cooperation, Foreign Affairs and Environment to organize a meeting for African Finance Ministers, alongside the 2022 International Cooperation Forum, held in Egypt in September 2022, where the idea of forming the Sustainable Debt Coalition was introduced and obtained wide support from African countries. Following the positive reception from several African states, and the national adoption of the Sustainable Debt Coalition initiative as one of Egypt's working tracks during the activities of COP27, the Ministry of Finance is now working with the Ministry of Foreign Affairs to table this initiative at the international level and begin operationalizing it.

Coordination of a whole-of government approach can also be handled by a dedicated agency. For example:

- **France** in 2022 created the General Secretariat for Ecological Planning, under the authority of the Prime Minister, which coordinates the development of national strategies for climate, energy, biodiversity and the circular economy and aims to ensure that these strategies are implemented by all the ministries concerned

and translated into action plans. It coordinates working groups preparing roadmaps and objectives for each economic sector to meet five green objectives, including reduction of greenhouse gas emissions, climate change adaptation and biodiversity restoration. The Ministry of Finance actively engaged in most of the working groups and is currently in charge of two groups: sustainable finance and decarbonizing industry.

While line ministries are often split into small units focusing on a narrow set of specific issues, Ministries of Finance have an ability to take a broad systemic approach to climate policy. Some Ministries of Finance oversee the process of bringing the issues relevant to climate change together and balancing diverse measures proposed by line ministries. For example, in **Ireland** the elaboration of the Climate Action Plan is coordinated through the Department of Finance, which develops measures in collaboration with the Department of the Environment, Climate and Communications.

Many Ministries of Finance are developing their own coordination mechanisms and/or participating in existing coordination mechanisms with other stakeholders, including the private sector, civil society and arm's length agencies. Examples include:

- In **Chile** the Ministry of Finance actively participates in or hosts several roundtables and working groups on specific sustainable and climate finance issues involving non-governmental stakeholders, in addition to sitting on the Council of Ministers for Sustainability (see Box B21).
- In **Ireland** the Department of Finance has created a climate economy group, which draws contributions from other relevant agencies, including those dealing with public expenditure and reform, the Debt Management Agency, and the central bank, and may invite other stakeholders such as the Environmental Protection Agency to present to the Ministry or the Climate Change Advisory Council, which advises the Minister for the Environment on the carbon budget.
- In **Uruguay** the Ministry of Finance together with the central bank and with support from the IDB, IDB Invest and the United Nations System is promoting a Sustainable Finance Roundtable, in which different members of the financial system participate with the objective of promoting the integration of environmental, social and governance (ESG) aspects into the decisions of market agents.
- In **France** the Ministry of Finance coordinates sector decarbonization roadmaps with stakeholders from industry and local government.

The Coalition of Finance Ministers for Climate Action Sherpas meet in Helsinki, March 2023

Box B20. Denmark: The role of the Ministry of Finance in coordinating government policy

The Danish government has taken several steps to ensure that climate and environment aspects are analyzed and taken into consideration in political decision-making. Denmark's Minister for Climate, Energy and Utilities is a permanent member of the Cabinet's Economic Committee, which is chaired by the Minister for Finance and handles policy decisions that have significant economic or fiscal consequences. The Minister for Climate, Energy and Utilities chairs the Cabinet's Green Committee, tasked with ensuring that climate and environment considerations are strengthened and integrated into government policies.

In 2020, the Danish government established a Climate Task Force at senior official level to develop analysis and prepare and coordinate submissions to the Cabinet committees on major crosscutting climate policy proposals. Because the climate policy effort needed to meet Denmark's 2030 emissions reduction target requires a mix of significant public investment, regulation and economic incentives across all sectors of the economy, the Ministry of Finance was tasked to chair the Task Force. This gave the Ministry of Finance a central role along with the Ministry for Climate, Energy and Utilities and other sectoral ministers in the development, coordination and political negotiations of the government's policy proposals.

Since taking office in 2019, the Danish government has delivered political agreements on a significant number of climate policy packages:

- Green transition in road transport (2020)
- Green housing agreement (2020)
- Waste management and circular economy (2020)
- Climate agreement for energy and industry (2020)
- Agreement on North Sea oil and gas extraction (2020)
- Climate agreement for agriculture (2021)
- Green tax reform (2022)
- Greener and more secure Denmark—acceleration of renewable energy and phase-out of gas (2022).

Source: Prepared by the Danish Ministry of Finance

Opportunities for action

Ministries of Finance should have a central and active role in inter-agency and stakeholder coordination and ensuring a whole-of-government approach to climate change policy. In particular, they should build strong collaborative relationships with Ministries of Environment and other key line ministries. Ministries of Finance should consider:

- Identifying areas requiring coordination and collaboration related to climate change across the key functions in national development and climate strategies, investment planning, macro and fiscal policy, financing, and the other key capabilities, and including them in internal climate strategies or plans.
- Reflecting participation of the Ministry of Finance in coordination mechanisms on climate change in its mandate and internal strategies and allocating resources accordingly.

- Ensuring the Ministry of Finance is represented in the key decision-making and consultative mechanisms related to climate change policy and is taking an active role in these forums to ensure policy alignment and coherence, and delivery of a whole-of-government approach to climate action. This also requires that the Ministry is part of the ministerial group in charge of climate issues.
- Ensuring internal governance arrangements on climate change within Ministries of Finance explicitly address intra- and inter-departmental coordination, and engagement with non-governmental stakeholders. This includes:
  - Ensuring staff are designated internally to cover each of the coordination and collaboration mechanisms and communicating the internal divisions of responsibilities externally
  - Ensuring continuity in focal point roles to develop stronger relationships with external counterparts.
- Expanding collaboration with line ministries and other stakeholders to maximize mutual capacities and build on joint expertise. Ways to do this include through working groups, roundtables, joint training programs and consultations on policy proposals.
- Establishing clear feedback mechanisms for coordination and consultation mechanisms on climate change for interactions with both public and private stakeholders. This includes providing information on how the input received during the consultation has been treated and being transparent on the next steps.
- Strengthening collaborative relationships between Ministries of Finance and Ministries of Environment, including through recognition of mutual differences in backgrounds, and relative strengths and constraints, including through holding joint seminars or informal discussions, for example to share latest developments on the relevant policy instruments or learning from past projects, to bridge potential differences in expertise, to learn from each other, and to join the country's delegation at the international climate negotiations.

Box B21. Chile: Coordination on green finance strategy with other actors by the Ministry of Finance

The Ministry of Finance in Chile is part of the **Council of Ministers for Sustainability** and participates in several roundtables and working groups on specific sustainable and climate finance issues involving non-governmental stakeholders.

Through the **public–private green finance roundtable** the Ministry of Finance is constantly engaging with regulators and financial market participants. As part of this initiative, the Ministry has led webinars and workshops to strengthen the financial market's capabilities to better understand and manage the risks associated with ESG and climate issues. It has also led initiatives that have ended up guiding public policies and set best practice in the Chilean financial sector, including a Taxonomy Roadmap for Chile toward consolidating green finance, published in 2021.

One of the Roadmap's recommendations was to establish a Preparatory Committee to give advice on the structural elements of a future Chilean green taxonomy. This committee is composed of specialized professionals from the Ministry of Environment, the CMF (financial regulator), Pension Funds Supervisor, and the Central Bank of Chile as well as the Ministry of Finance; and is supported by the IDB with CBI. The taxonomy will be one of the main policies to funnel more investment into sustainable projects. It will set clear definitions on what activities contribute to sustainable and climate-related objectives based on science and in coordination with the private sector.

The Ministry of Finance is also part of the **inter-ministerial roundtable for financing the green hydrogen industry,** and other working groups and roundtables including the Natural Capital Committee; the Working Group on Finance and Sustainable Development, Pacific Alliance; the Community and Regional Climate Finance and Action Group (GaFiCCor); the Gender and Climate Change Roundtable; the Bunker Fuels Roundtable; and the Task Force Roundtable on Article 6.

Source: Prepared by the Ministry of Finance of Chile

Capability 3. Human capacity, expertise and economic decision-making tools

Helsinki Principles 2 and 4

Mainstreaming climate action across Ministries of Finance will require substantial changes to staffing, skills and expertise, including the analytical tools used within Ministries. This section first discusses enhancing the skills and expertise of ministerial staff (Capability 3a), and second, enhancing economic decision-making tools and data-driven analysis to inform decision-making (3b).

Capability 3a. Enhancing skills and expertise

Context and role of Ministries of Finance

Climate change is a fast-paced and relatively new policy issue for Ministries of Finance: hence many lack the relevant subject matter expertise and complementary staffing capacity to drive the transition to net zero. Most Ministries of Finance therefore have plans to expand their expertise across a range of areas (Coalition of Finance Ministers for Climate Action, 2022f), independent of whether they have decided to set up a dedicated climate unit (see Capability 1).

Ministries of Finance will need to develop and utilize new skills and expertise to fulfill responsibilities arising in responding to climate change. While the exact skills required will depend on each Ministry's work and priorities, a basic understanding of the latest climate science and climate change economics is required to increase awareness and facilitate the mainstreaming of climate into all ministerial operations. In addition, based on the framework used in this report, skills and areas of expertise can be identified that will be crucial for a successful transition. These include technical skills in developing national strategies, investment planning, and designing specific fiscal and public policy measures spanning key elements of taxation, debt and budget management, alongside skills related to raising, blending and steering finance. They also include more crosscutting expertise, such as the sectoral knowledge needed to be able to understand the challenges and investments in key economic sectors.

Table B4 provides an overview of the required skills and expertise that Ministries of Finance should seek to expand through hiring or upskilling staff.

> **Most Ministries of Finance have plans to expand their expertise across a range of areas, independent of whether they have decided to set up a dedicated climate unit.**

Table B4. Overview of climate action skills needed in a Ministry of Finance fit for the 21st century

Essential skills and expertise	
Crosscutting - Fundamentals of climate science - Climate change and environmental economics - Risk management - Sectoral expertise - Climate law	
Developing climate and development strategies - Developing NDCs, NAPs and LTSs - National adaptation planning - Greening national development planning - Green industrial policy - MRV frameworks and tools, tracking of financial flows	**Raising, blending and steering finance** - Raising, blending and steering finance - Green financial markets and instruments (incl. debt and bond instruments) - Mobilizing and accessing climate finance, including adaptation and disaster risk finance - Financial sector supervision and stress-testing - Green infrastructure financing - Understanding of SOEs, SWFs, and NDBs - MDB and DFI policies and strategies
Investment planning - Climate investment needs assessments - Green investment planning - Greening and strengthening public investment management - Building and greening project pipelines, project support for bankable projects - Climate investment appraisal	**Just transition** - Distributive impact assessments - Socioeconomic and regional development - Social security systems and reforms - Mainstreaming gender into climate planning
Taxation, debt and budget management - Macroeconomic analysis of climate change - Green fiscal policy (and application in key sectors) - Fiscal risk management - Carbon pricing, subsidy reform - Green budget planning and reporting - Greening public financial management - Greening public investment management - Green public procurement - Environmental policy evaluation	**Decision-making tools and models** - Macroeconomic tools - Climate-economy models - Sector models - Policy and project appraisal tools

Source: Prepared by the authors

Barriers to action and ways to overcome them

A recent survey and interviews for this guide reveal that many Ministries of Finance are struggling with four key skills and capacity challenges that are preventing them from more proactively driving climate action:

- **Limited awareness of climate change issues.** Ministry staff at all levels tend to lack awareness of climate issues and their impacts, which can mean that the case for expanding expertise and recruiting specialists is not sufficiently well understood.
- **Shortage of dedicated staff.** Many Ministries of Finance, particularly in developing countries, only have a small number of staff dedicated to working on climate action full-time. Even ministries with larger climate units struggle to keep on top of a fast moving and expanding agenda. In a recent survey by the Coalition of Finance Ministers 43% of respondents noted that their Ministries of Finance did not have sufficient capacity to develop or implement a climate change strategy, but positively, most reported having plans to increase the Ministry's capacity in this area (Coalition of Finance Ministers for Climate Action, 2022g).
- **Significant skills gaps.** Ministries of Finance lack both more general climate and climate-economics-related skills, and staff with relevant subject expertise, such as on green finance or green budgeting. This is aggravated

by the fact that many staff come from economics or finance backgrounds, while social, computer and natural scientists are rare.

- **Lack of tools and models.** The use, development of, and access to tools needed to inform high-quality decision-making need to be bolstered considerably. This is discussed in Capability 3b.

Attracting and retaining skills and expertise on climate is also inherently difficult and Ministries of Finance seeking to do so face a range of barriers. These include:

- **Intensive resource requirements of designing in-house training programs.** Particularly for Ministries of Finance with fewer resources and smaller teams, building in-house training programs is unlikely to be a feasible option. Even for Ministries with more capacity it will be impossible to offer an up-to-date training program that covers all the specialist skills required.
- **Expensive external training.** While in-house training can be supplemented or replaced with external training, access to specialized training can still be difficult for staff from low-income countries, as well as for small and vulnerable middle- or high-income countries that have relatively limited fiscal resources.
- **Restrictions on hiring additional staff.** Hiring specialized staff can be difficult, particularly for Ministries experiencing tight budgets and/or staffing limitations. In addition, existing skill requirements for new staff centered on the traditional 'core' functions of Ministries of Finance might make it difficult to find staff with suitable climate skills
- **Difficulties in retaining expertise and knowledge.** High staff turnaround and reliance on external consultants supported by internationally funded projects make it difficult to retain expertise on climate change in Ministries of Finance over the long term (see for instance the case of Fiji, Box B16).
- **Failure to institutionalize external knowledge.** Ministries of Finance often struggle to obtain research and evidence from academia and the wider research community to match the pace of and scale of transformation in macroeconomic and fiscal policies required to build the sustainable, inclusive and resilient economy we need. As a result, interactions between researchers and policymakers are often limited. Where joint projects emerge, they are often one-off, issue-specific projects that are far removed from the continuous, broad and thorough collaboration that is needed to ensure evidence-based policymaking.

Ministries of Finance can take measures to expand their skills and expertise and to address some of these barriers. Most importantly, when seeking to enhance staff capacity and expertise, they should consider combining several measures, by investing in training and capacity-building programs, hiring specialist staff, engaging in peer-to-peer learning and knowledge networks, and improving collaboration with external knowledge providers including universities, think tanks and international organizations. As well as creating personal capacity by training individual staff, they should also seek to increase long-term institutional capacity, especially in Ministries with high staff turnover.[54]

Training staff on climate issues is critical for developing the necessary in-house expertise, but little investment in such training has been made to date. According to the Helsinki Principle 2 survey, only four Ministries of Finance offer training in climate-related issues (Coalition of Finance Ministers for Climate Action, 2022g).

Two types of training are needed in particular:

1. **Dedicated staff working directly on climate change topics need to acquire a blend of both specialist and crosscutting skills,** with the balance depending on the size and priorities of the cadre working on climate issues (see Table B4). Depending on their size and capacity, Ministries of Finance can either build dedicated in-house training programs or take advantage of the growing number of training programs offered online or in person by international institutions and universities. Many of these are offered for free or at subsidized rates for participants from low-income countries (Coalition of Finance Ministers for Climate Action, 2022g).

[54] Many officials interviewed for this guide highlighted the excitement of staff to work on climate issues, and the relative ease of hiring experienced staff. As Ministries of Finance expand their work on climate this could help retain staff, particularly in developing countries where financial incentives to improve staff retention are often limited.

2. **All ministerial staff need to receive some basic climate training** to ensure that all staff have awareness and understanding of climate issues and how they affect the work of the Ministry. This could be done by integrating climate into general Ministry of Finance training courses, or by designing a dedicated climate training course for all staff (e.g. as the US Treasury is doing).

Climate training should not be a one-off event for either of these groups, but rather a sustained and continuous effort. Ministries of Finance should take care to avoid 'competence greenwashing' (Schumacher, 2020)—sending their staff on short-term courses at the expense of fundamentally rethinking the different skillsets teams need and building the required expert-level technical knowledge. Meanwhile, to stay up-to-date with the latest developments, drawing on knowledge and material from a wide range of sources is essential.

External training is often expensive, so Ministries of Finance may prefer to benefit from the growing number of climate-specific training programs aimed at government officials, offered online or in person by international institutions, NGOs and universities. Many of these courses are offered free of charge or at subsidized rates for participants from low-income countries. The Helsinki Principle 2 report provides an overview of relevant training opportunities (Coalition of Finance Ministers for Climate Action, 2022g). For instance, the IMF offers a free eight-week course on the macroeconomics of climate change for government officials. However, while available courses cover a wide range of topics, most are run by providers in the Global North, and there is a lack of courses tailored specifically to staff in Ministries of Finance.

As the responsibilities of Ministries of Finance on climate grow, expanding the number of staff working on climate will be as important as training existing staff. Many Ministries have recently substantially increased the number of staff working on climate-related issues. For instance, in the UK Treasury the number as risen from around 20 to, at times, more than 100 over the past decade. Interviews conducted for this report highlight that Ministries of Finance that have rapidly increased their staff have usually done so through a mix of moving staff internally, hiring from within the civil service, including the Environment Ministry, and hiring externally.

When hiring new staff, Ministries of Finance should consider the diversity of their workforce, in terms of skills and expertise. The fact that economists dominate in many Ministries of Finance can lead to insular thinking and consequent difficulties in coordinating with other line ministries (see Box B18). A lack of diversity and inclusivity within the economics profession itself is a major issue (e.g. Ambler et al., 2022). Staff diversification, including through hiring staff from Ministries of Environment or staff with backgrounds in climate science, will bring in environmental expertise and different ways of thinking, but also help improve coordination with other ministries. For instance, the **German** Ministry of Finance has traditionally exclusively hired staff trained as economists and lawyers, but is now also employing a growing number of social scientists and staff from other backgrounds. In addition, an equal gender balance can help to ensure that the specific needs of women are not overlooked in climate mitigation and adaptation. Recent evidence suggests that female representation among decision-makers is linked to more effective climate policy (Mavisakalyan and Tarverdi, 2019).

In addition to hiring and training, a range of options exist that can help Ministries of Finance to fill expertise gaps and upskill staff through domestic and international partnerships. This might include:

- **Engagement with knowledge networks and peer-to-peer learning.** Networks like the Coalition of Finance Ministers that provide a space to share experience and best practice, explore new topics and discuss with peers are valuable sources of information. Indeed, many interviewees highlighted the positive role the Coalition has in supporting knowledge development and exchange and the benefits its work brings to the individual Ministries of Finance. **Bilateral exchanges** between Ministries of Finance can be particularly useful to discuss the implementation of different policies and how to overcome specific challenges.

- **Regional learning and exchange networks.** Learning experiences can be particularly effective when they enable interaction between countries facing similar challenges and with similar existing capabilities and resources. Countries can leverage best practice and lessons learned from neighboring countries to enhance resilience to climate change.
- **Engagement with academia and other external research providers.** Academia and wider research communities can help Ministries of Finance to draw from a broad range of country-specific research, evidence and expertise. The HP2 survey finds that 64% of participating Ministries of Finance say they have some form of research institute that provides climate-related economic and policy advice (Coalition of Finance Ministers for Climate Action, 2022g). When engaging with the research community, Ministries of Finance should consider what research they need and who might be best placed to provide it. Governments are more likely to work well with academic researchers for deep dives into a particular topic or debate, policy monitoring and evaluation, and theoretical discussions and thought leadership, such as the Dasgupta Review on Biodiversity commissioned by the **UK** Treasury (Dasgupta, 2021). By contrast, institutional partners, think tanks and research institutes are more likely to be able to assist with applied empirical research, synthesis and analysis of existing literature with quick turnaround times to support more urgent policy questions. Ministries of Finance can establish collaboration with researchers by taking steps including:
  - Publishing areas of research interests online as a starting point for engagement with a range of researchers
  - Publishing consultations on policy proposals
  - Setting up an external advisory committee for specific projects to encourage sustained collaboration
  - Designing secondment schemes to bring researchers with the required skills in-house temporarily
  - Developing knowledge partnerships
- **Seeking assistance from bilateral donors and international institutions and capacity-building programs.** Ministry staff can participate in courses and workshops organized by these groups, and in capacity-building programs (see Box B22). Some initiatives, like the NDC Partnership's Economic Advisory Initiative, also temporarily embed economic advisors into Ministries.
- **Leveraging expertise from other government agencies and line ministries.** Ministries of Finance can work together with line ministries and other government agencies to tap into their climate expertise.
- **Hiring consultancies.** Where there are tight budgets or staffing limits, Ministries of Finance can consider careful hiring of short-term consultants to fill specific knowledge gaps or implement discrete projects. However, if not well managed, relying on consultants can have a range of drawbacks, including a relative lack of scrutiny compared with work produced by in-house staff, a lack of access to relevant stakeholders, and a possible lack of country-specific expertise. Most importantly, hiring consultants is unlikely to permanently increase capacity, whereas hiring or training staff can. Ministries of Finance can avoid these issues by, for instance, pairing a consultant with a permanent staff member to increase access and scrutiny while also creating a learning opportunity for permanent staff and facilitating the retainment of any knowledge created during the consultancy.

Fixing skill and staffing gaps and building systems that enable the regular expansion of knowledge will require sustained efforts by Ministries of Finance. For many advanced economies, rapidly expanding capacity is often a question of political will. The UK Treasury's response to the global financial crisis demonstrates that Ministries of Finance are able to act with flexibility and speed in times of crisis, providing that the crisis is a clear political priority (see Box A3). Similarly, the US Treasury has prioritized rapid (re)building of climate expertise since Biden took office. The example of Fiji (see Capability 1) shows that this can also be possible in developing countries. For most countries, however, sustained long-term efforts will be needed to build the relevant experience. In most cases, relevant measures will likely include a combination of all the approaches discussed in this section. One option to drive and formalize the expansion of skills is to incorporate capacity-building into Ministries' of Finance climate strategies and define clear objectives, actions and outcomes (see Capability 1).

Box B22. Selection of initiatives supporting capacity-building in Ministries of Finance

The **World Bank** is launching a new whole-of-government capacity creation program for climate action called C3A, which is targeted at Ministries of Finance and will feature knowledge from the most recent climate-related science and economic research. It addresses demand from Coalition and non-Coalition member Ministries of Finance; evolves as needs and knowledge change over time; and helps to highlight emerging issues across the whole of government. In addition, a live and interacting community of practice will be launched as a meeting place for practitioners. Priority will be given to knowledge ecosystems in partner countries to service the needs of Ministries of Finance at the country level.

The **Resilience and Adaptation Mainstreaming Program (RAMP)** together with the University Network for Strengthening Macrofinancial Resilience to Climate and Environmental Change support central ministries, including Ministries of Finance, in aligning economic development with macro-critical climate change risks and scaling up climate finance.

The **Green Fiscal Policy Network (GFPN)** is a partnership between UNEP, the IMF and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) to promote sharing of knowledge and best practice, and dialogue on green fiscal policies. It seeks to raise awareness of the potential of green fiscal policies to address environmental challenges and promote sustainable economic growth through research, policy analysis and advocacy. It also helps build partnerships among policymakers and stakeholders in different countries and regions.

Several climate funds also offer programs that can provide support to Ministries of Finance, including the Green Climate Fund's **Readiness Programme** and the Adaptation Fund's **Readiness Programme for Climate Finance.**

Information on many other programs that support Ministries of Finance on specific topics can be found in the relevant sections of this report.

Real world examples

Given the relatively nascent engagement by Ministries of Finance with the climate change agenda, efforts to build skills and staff capacity are fragmented and limited in time, scope and theme. However, a growing number of countries are investing in expanding their expertise through a variety of ways.

Some countries have started to integrate climate into their training programs. For example:

- In **Denmark** new staff in the Ministry of Finance attend a training course called Kickstart, which includes a general session on climate. In addition, Copenhagen University offers a popular climate change and economics module for civil servants.
- The **US** Treasury is currently developing a Climate Literacy Program to increase the climate change knowledge and expertise of all staff. This is part of a broader 'Rebuilding Program Capability' plan, one of the priority adaptation action areas outlined in its Climate Action Plan, which also foresees that each bureau takes stock of current skills and develops bureau-level climate action plans.
- In both these countries, staff also regularly attend internal and external workshops and webinars, such as those offered by the Coalition or the IMF.

Regional knowledge-sharing and training initiatives are also growing. For example:

- In 2021 the Helsinki Principle 4 Working Group and the World Bank hosted a regional conference on climate-informed public investment management for African countries, followed by a week-long training course in April 2022.

- The **Africa Green Finance Coalition,** announced at COP26 by Kenya's National Treasury, is intended to bolster pan-African collaboration too, and provide resources, expertise and services to harness the opportunities linked to the transition. The African Green Finance Coalition, as an African solution to African challenges, uses peer learning, peer review and expert advice to support Ministries of Finance and Environment, central banks and financial institutions to scale up the mobilization of green finance.
- The Nordic Council of Ministers has organized meetings and workshops, including in September 2022 on 'Integrating Climate into Macroeconomic Modelling'.

Boxes B23 and B24 discuss additional regional efforts in the EU and Latin America and the Caribbean.

Some Ministries of Finance have developed ad hoc or permanent arrangements to leverage external expertise. For example:

- The **Irish** Department of Finance has had a Joint Research Program with the Economic and Social Research Institute since 2015. Cooperation has often focused on carbon pricing. For instance, in 2020 the Institute examined how the impact of carbon tax increases could be made progressive through tax and welfare changes. This research informed budgetary decision-making in the 2021 budget, where the carbon tax was increased by €7.50 per tonne. It resulted in a progressive budget in which most benefits accrued to households with the lowest 40% of income, due to targeted increases in social welfare payments for retired people, families with children, and adults living alone (Coalition of Finance Ministers for Climate Action, 2022f).
- The **Korean** Ministry of Finance collaborates closely with a range of Korea's leading policy research institutes, requesting advice on academic topics.
- The **Danish** Ministry of Finance is serving as secretariat for the commissions of external experts tasked with developing proposals for new green polices. This has helped build up internal insight and capacity in the Ministry of Finance and to negotiate political agreements.
- The **UK** has established a Green Technical Advisory Group (GTAG) to provide independent advice to government on a green taxonomy (Green Finance Institute, 2022). The UK also has long-standing experience in commissioning research from leading academics, such as the Stern Review on the Economics of Climate Change (Stern, 2006) and Dasgupta Review on the Economics of Biodiversity (Dasgupta, 2021), well-known examples of the utilization of research in the planning and design of climate and economic policies.

When seeking to enhance staff capacity and expertise, Ministries should consider combining several measures, by investing in training and capacity-building programs, hiring specialist staff, engaging in peer to-peer learning and knowledge networks, and improving collaboration with external knowledge providers. As well as creating personal capacity, they should also seek to increase long-term institutional capacity, especially in Ministries with high staff turnover.

Box B23. EU: Supporting the implementation of green budgeting practices through tailor-made training

The European Commission has developed a technical support initiative to help Member States build administrative and technical capacity for developing a green budgeting framework at the national level. The training is funded by the EU via the Technical Support Instrument and supports the alignment of current or planned national green budgeting practices with the European Commission's Green Budgeting Reference Framework (European Commission, 2021). The technical support project provides Member States with practical training and tailored support in piloting green budgeting tools, such as identification of green and brown items in specific sectors of their national budget. The initiative targets staff of Ministries of Finance and ministries responsible for climate and environmental aspects of the budget. Training sessions are organized by the Commission with Expertise France, and in cooperation with the Institute for Climate Economics (I4CE).

Current capacity development support is delivered in the format of three modules:

- Module 1 is organized in a joint session for several countries together, to facilitate knowledge-sharing. It introduces the concept of green budgeting, provides an overview of existing green budgeting frameworks and national practices, and some basics on performance budgeting and green tagging.
- Module 2 is carried out separately by country, consisting of case studies that are tailored to country-specific needs focusing on a specific sector selected by each Member State. The case studies provide an understanding of the main methods and challenges of identifying tax expenditure and revenue that are relevant to climate and environmental objectives.
- Module 3 is a country-specific guided diagnostic/self-assessment of the national green budgeting framework, focusing either on the governance/institutional set-up for green budgeting or on existing practices, and concluding with recommendations on areas for improvement.

All Member States have already completed the introductory webinars, which accommodated more than 500 participants in seven sessions, while country-specific sessions have been periodically conducted since September 2021. The training is an opportunity for participants to gain exposure to the latest developments in green budgeting and interact with experts from the European Commission and other international organizations along with green budgeting practitioners from other Member States. As a result, participants have developed a solid understanding of existing frameworks and approaches at national, EU and global level, including methods and challenges to identify revenue and expenditure relevant for environmental policies.

In the medium term, the training will help participants implement tools and recommendations to better consider environmental goals in budgetary decision-making. The practical knowledge acquired will have a major positive impact on greening public budgets, contributing to the green transition in line with the goals of the European Green Deal, through:

- Supporting national authorities to obtain the necessary technical know-how to design and implement green budgeting reforms.
- Contributing to a mainstreaming of green budgetary policies and processes.
- Promoting efficiency, accountability and transparency of policies, as well as parliamentary oversight of national effort toward the green transition.

The European Commission stands ready to further support Member States in the next phases of reform implementation, including green budget tagging, environmental impact assessments and green spending reviews.

Source: Prepared by the European Commission

Box B24. How the Inter-American Development Bank (IDB) is helping Latin America and the Caribbean implement green fiscal policies

The IDB is working with governments to mitigate and adapt to climate change and promote a sustainable and just transition to green economies in Latin America and the Caribbean. The Bank is working closely with Ministries of Finance to design and implement green fiscal policies that will help its member countries not only invest more but also improve the efficiency and effectiveness of their spending to address climate change.

The Bank has been working to close knowledge gaps and develop instruments for Ministries of Finance to include climate considerations in medium-term fiscal planning and budgeting and to measure and monitor climate-related spending. As a result, the Bank and the Government of Germany created a €17.5 million trust fund in 2021 to help increase the transparency, effectiveness and efficiency of climate-related fiscal policy and management in the region. The fund finances country-specific technical assistance projects in activities such as the preparation of national climate finance strategies and instruments, development and implementation of fiscal policy instruments and methodologies to track and evaluate climate-related public resources and expenditure, promotion of partnerships and knowledge exchange about green fiscal policies, and support for capacity-building on matters related to fiscal policies and climate change management.

In 2022, the fund supported the creation of a knowledge sharing platform—the Regional Climate Change Platform of the Ministries of Economy and Finance of Latin America and the Caribbean. This enables Ministries of Finance to exchange best practice in the design and implementation of green fiscal policies and help them better align their public finances with national resilience and decarbonization goals. The activities are aimed at improving decision-making and supporting the design and implementation of countries' commitments under the Paris Agreement. They are also expected to contribute to efforts to leverage additional sources to finance the transition to net zero and climate-resilient economies.

Under this current strategy, the IDB expects its member countries to have the building blocks to better measure and plan their climate spending, an important prerequisite to designing and implementing more robust and comprehensive green fiscal policies, which can be financed by IDB in the future through instruments such as policy-based and investment loans.

Source: Prepared by Huascar Eguino (IDB)

Opportunities for action

To proactively drive climate action, Ministries of Finance will need to develop and utilize new skills and staff capabilities. This will require significant investment in the hiring and training of staff, along with building relationships with knowledge networks and external research providers.

In particular, Ministries of Finance should consider the following steps:

- **Assess skills gaps.** Ministries of Finance first need to have a clear plan of what capacity to deal with climate change already exists internally and what expertise can be sourced externally and how. They should therefore consider conducting an assessment of existing skills and capacity gaps, including of 'dormant' skills that might not currently be being used. The list of training areas above (Table B4) and the Framework for Ministries of Finance can help inform these assessments.
- **Develop a training plan.** In a second step, Ministries of Finance should consider developing a training plan to specify how existing gaps can be filled and how to ensure that staff can stay up-to-date. The plan should target the training needs of climate staff and of all other Ministry staff and consider all possible measures discussed

in this section, including in-house and external training, peer-to-peer learning, and collaboration with external knowledge providers.

In addition, Ministries of Finance should:

- **Consider creating a regional or global network of research institutions,** which could support the work of Ministries of Finance, including Coalition members, and provide the necessary evidence base for scaling up investment and enhancing fiscal policies to drive climate action. It could also support the establishment of bespoke research institutions to support Ministries of Finance at the national or regional level where no suitable institutions exist. This could initially focus on the Global South, where improving access to research, evidence and skills is particularly urgent.
- **Consider loosening staff hiring requirements** to allow hiring of staff with more diverse expertise and backgrounds.
- **Improve global training opportunities and access to them,** by engaging with external training providers. Ministries of Finance should also encourage training providers to consider making exceptions for small and climate-vulnerable countries that are not in the low-income category but might also require access to free training.
- **Expand peer-to-peer learning,** to build bilateral exchanges particularly between Ministries of Finance in developing countries and those in countries that have already made greater steps toward mainstreaming climate. Some interviewees also voiced their interest in the possibility of secondment or exchange programs that could see subject experts from different countries spending time in another Ministry.

Capability 3b. Enhancing skills and expertise

Context and role of Ministries of Finance

All models are wrong, but some are useful (Box and Draper, 1987)

To act on climate, Ministries of Finance have a fundamental need for strong analytical capability to inform high-quality decision-making. As well as internal Ministry of Finance capability, this includes the related capabilities in relevant line ministries, state-owned enterprises, investment funds, development banks and financial sector regulators.

Moreover, as the climate continues to change, the public sector will more than ever need precise data, predictions and projections to assess risks and identify opportunities. Reliable information will help to accelerate the switch to the net zero, climate-resilient economy—information on climate hazards, asset exposure, vulnerability, emissions, and new technologies and their cost profiles.

Ministries of Finance will need to place an ever-greater emphasis on upgrading existing tools and/or developing new tools to support decision-making, supported by high quality data. Ministries of Finance already use a wide range of analytical tools to support economic decision-making, from macroeconomic and budget modeling and forecasting approaches to providing guidance to line ministries on cost–benefit analysis. To make improvements, Ministries of Finance need to better understand:

- **The impact of physical climate risk** on the economy and public finances over time.
- **The economic, social and financial costs and benefits of long-term decarbonization and resilience pathways,** including direct and indirect impacts at the macro and micro level, and the risks of business-as-usual.

- **The economic, social and financial impacts of different policy options** to reach decarbonization goals and enhance resilience, and the trade-offs between them. These include sectoral and regional impacts (including on employment): for example, determining how a region dominated by a heavy, carbon-intensive sunset industry might be affected.
- **The specific fiscal implications of the combined long-term economic, policy and financial changes.** These typically include a mix of positive changes through new tax mechanisms, industries benefiting from the transition, new sources of exports, impacts on productivity, reduced subsidies, and reduced expenditure on health, and negative changes through lower tax revenues from fossil fuels, reduced consumption in select sectors, industries suffering from the transition, export losses from stranded assets, incremental investments in clean infrastructure, and the cost of workforce retraining and support measures.

It is especially important that Ministries of Finance understand the impact channels of the transition on the public finances. These tend to operate in two stages:

- **The micro and macroeconomic impacts from physical climate impacts and climate action.** These operate through altering the demand, supply and distribution of goods and services; fundamental structural change in the economy with its impacts on productivity, jobs and stranded assets; and direct and indirect economic damages from physical climate impacts.
- **The direct and indirect fiscal impacts from these economic changes.** These operate through impacts on tax revenue and spending. For example, in the short term a carbon tax can increase tax revenue whereas a subsidy for renewable energy can increase public spending. The long-term fiscal impacts are the most difficult to estimate.

Four main strands of decision-making tools can support Ministries of Finance in this journey:

- **Macroeconomic tools.** These estimate the economy-wide costs and benefits, including fiscal impacts, of climate policies and investment at scale. They include numerous approaches such as Computable General Equilibrium Models (CGE), macro-econometric models, dynamic stochastic general equilibrium models, and simple spreadsheet models. Newer approaches that attempt to tackle the significant shortcomings in these approaches include Agent Based modeling, system dynamics models, disequilibrium macroeconometric models, and social accounting matrix approaches.
- **Climate–economy models.** These tend to estimate physical climate impacts and the economic costs of reaching decarbonization targets and historically have given insufficient attention to the risks of tipping points, net benefits, structural change, and innovation. They include numerous approaches such as bottom-up climate-energy models and Integrated Assessment Models (IAMs).
- **Sector models.** These tend to focus on estimating sector-specific costs and benefits, including fiscal impacts of climate policies and investment in the oil, gas and transportation sectors, without factoring in links with the wider economy.
- **Policy and project appraisal tools.** These tend to focus on estimating the direct and indirect economic impacts of major policies or large-scale investment programs and projects at a single point or several points in time. They include traditional static cost–benefit analysis approaches and newer approaches that seek to address their shortcomings in assessing how a policy will affect the processes of change over the course of time by transforming the economy, such as risk–opportunity assessments, recently pioneered by the Economics of Energy Innovation Systems Transition programme (EEIST).

All these approaches have their uses, advantages and disadvantages. Ministries of Finance should give priority to tools that are able to assess the potential for climate tipping points and for climate action and investment to drive dynamic change in the economy.

Contrary to common current practice, often it may be more effective to mainstream climate action by revamping existing Ministry of Finance tools rather than reinventing the wheel, provided the existing approaches are fit for purpose. This has been demonstrated, for example, by:

- **Uganda,** which factored green investment into its preferred existing macroeconomic model —the Maquette for MDG Simulations (MAMS)—used by the Ministry of Finance, Economic Development and Planning, to inform powerful new commitments on climate (New Climate Economy, 2018). This demonstrated that green investments could boost GDP by 10% by 2040, create 4 million jobs, and reduce emissions by nearly 30% over a conventional growth pathway.
- Other examples, pioneered by the Global Commission on the Economy and Climate and New Climate Economy in partnership with national governments, include new macroeconomic assessments of the dynamic economic and jobs benefits of decarbonization pathways, which have informed NDC revisions. Analysis of **Indonesia**, for example, showed that a low-carbon growth path could deliver GDP growth averaging 6% per year until 2045, help accelerate poverty reduction and boost jobs, with many other co-benefits (ibid.).

Emerging evidence suggests that Ministries of Finance should be especially cautious in their use of the older forms of macroeconomic and climate–economy modeling tools such as CGEs and IAMs. A growing group of economists have identified significant shortcomings in these models.[55] In simple terms: they tend to underestimate the risks of climate change and the opportunities of a transition to a net zero economy (albeit some IAMs are exclusively energy system models). This is because they underestimate non-linearities and tipping points in the climate system, are often designed to formulate theoretically 'optimal policies' rather than those that are empirically tested, and often dramatically underestimate the pace and potential of the zero carbon energy transition. In short: many models portray the transition as a process of marginal changes to economic output rather than as a structural transformation of technologies, institutions and practices and typically preclude the possibility that net zero innovations could improve welfare (Hepburn et al., forthcoming).

New ways to capture sectoral and technology shifts more accurately than existing CGE and IAM models do are being demonstrated by global efforts such as the Deep Carbonization Pathways project which has developed low-emission pathways for 16 countries based on an innovative pathway design framework (Waisman et al., 2019). There are also several system dynamic models such as that used by Earth4All, the flagship initiative of the Club of Rome, which integrate economic and social factors with planetary boundaries—capturing the physical limits of the planet.

Ministries of Finance should follow four important 'principles' when considering the development of their analytical capabilities and tools. In simple terms: use many approaches, make them simple and transparent, and 'do' scenarios:

- **Diversity of approaches.** Consider the use of a broad suite of different tools and approaches depending on the specific policy question or issue at hand, which naturally will involve choices between the specificity and generality of models or tools.
- **Matching approach to capability.** Consider the use of simpler methods and tools when there are not yet extensive multi-disciplinary tools available at the national level. Qualitative knowledge can sometimes be the best available, especially in capturing uncertainty.
- **Transparency and ease of explaining results.** Consider methods and tools that are transparent in their assumptions and about their pros and cons, and easy to explain to decision-makers. The more complex the model, the harder it is to explain the results.
- **Scenario and sensitivity analysis.** Consider undertaking scenario and sensitivity analysis using, for example, a range of baseline scenarios, discount rates and assumptions about future technological costs and benefits.

[55] For example: Ackerman et al. (2009); Beinhocker et al. (2018); Cai et al. (2016); DeCanio (2003); Dietz et al. (2021); Farmer and Lafond (2016); Hickel (2018); Ives et al. (2021); Meng et al. (2021); Mercure et al. (2016); Murphy (2018); Pindyck (2013); Pollitt and Mercure (2018); Rosen and Guenther (2015); Stern (2013, 2018, 2022), among many others.

When considering the use of macroeconomic models Ministries of Finance should ensure that they are able to factor in: the processes of transformative change and disequilibrium processes; non-linearity and uncertainty in physical and economic impacts; technological innovation as an endogenous, path-dependent process; equity and justice; and the empirical validity of a range of policy options based on historically tested data. For many developing countries, analytical approaches should include consideration of currency risk, which is salient when low-carbon projects are invested in foreign currency but bring returns in domestic currency. While equilibrium-based models can be used to envisage a desired end-state of a low-carbon transition, disequilibrium models will be more helpful for identifying which policies will be most effective in driving change—including innovation, investment, technology diffusion and cost reduction, as well as emission reductions.

It is important that Ministries of Finance, with other line ministries, consider how to tap into emerging developments in data science and Artificial Intelligence (AI). As aptly stated by *The Economist*, the world's most valuable resource is no longer oil, but data (The Economist, 2017). Data science and AI are emerging as powerful weapons in the fight against climate change, with applications from identifying national emissions and methane hotspots to forecasting clean power supply based on weather and precipitation patterns. AI techniques are being increasingly deployed in finance, in areas such as asset management, credit underwriting, and blockchain-based finance. AI can also be applied to accelerate research into new technologies such as synthetic biology, nuclear fusion, and carbon capture, usage and storage (CCUS) (Stern and Romani, 2023). Ministries of Finance can consider tapping into these developments as they revamp their analytical capabilities in addition to using the financial tools they possess to support the development of new national capabilities in climate-related data science.

Barriers to action and ways to overcome them

Ministries of Finance typically face a wide range of barriers to building their analytical capabilities, including:

- **Data availability and access.** Despite the plethora of global databases that can be obtained, often freely, from different organizations—such as the Global Trade Analysis Project (GTAP), the World Input-Output Database (WIOD), International Energy Agency and multiple sources of climate risk data—there remain issues of availability and access. One issue relates to time lags in data updates, which can cause problems when economic structures are changing rapidly. Other concerns are data coverage, especially in relation to tax and expenditure instruments, data comparability, and a lack of publicly available and accessible data on the costs of new technologies, the latter often causing a major barrier to private sector investors. The rapidity of developments in data science and AI can also be hard to track for public officials.
- **Shortcomings in modeling approaches.** Issues that are especially challenging to capture and quantify include innovation, the development of untested technologies, investor confidence, industrial competitiveness, the creation of new jobs, the resilience of social and economic systems, changes in preferences, disruptive changes in markets, the specifics of climate policy options, political economy issues, climate tipping points, and financial impacts.
- **Capacities.** Ministries differ in the resources, both human and financial, they have available to conduct or commission studies. It is important to have some modeling capacity and knowledge within the Ministry to at least be able to interpret results and communicate them well. Maintenance of the capacity to run, develop and interpret models in light of current events is as critical as their construction. (Coalition of Finance Ministers for Climate Action, 2022e)

There are particularly strong barriers to acquiring improved models that address some of the shortcomings with CGE and IAM approaches. These include:

- **Momentum.** Policymakers and civil servants are used to the current generation of models; convincing these stakeholders to invest time in adopting new approaches can be challenging.
- **Historical investments.** The current generation of models, despite their flaws, have thousands of person-years of investment and careers built on them. Many stakeholders want to avoid their models becoming 'stranded'.
- **Intellectual conservatism.** Many policymakers and civil servants in senior positions received their economics training during a period when theory was emphasized over empirical validation (in the 1980s–2000s).
- **Credibility.** There is a strong social network effect for current models, some of which were developed by credible individuals and institutions, meaning people can be reluctant to switch to new models.
- **Politics.** While enhanced or new models would be an objective improvement on previous approaches, climate action is a highly politicized issue. Thus, as new models are likely to produce answers to certain questions that are different from those produced by current models, there will be those who support and those who oppose those answers. (Hepburn, forthcoming; Stern, Stiglitz, et al., 2021)

It is possible to create strategies for Ministries of Finance to overcome these barriers, but due to the challenging nature of doing so, the process will likely need to be iterative and adapted over time.

Key aspects might include:

1. **Assessing the most pertinent questions to address.** Before making major investments in new analytical capability, Ministries of Finance should start with a mostly qualitative exercise to consider some major questions. For example, what actions, technologies and changes are needed to reach carbon neutrality by the target year? What are the potential direct and indirect channels through which climate change policies impact the economy and fiscal balances? Who would be the winners and losers under different policies?
2. **Gathering data.** Ministries should then assess their data requirements, and map opportunities to fill in potential gaps, including using the data and insights of other ministries, research institutions, national statistics offices, experts, and international organizations, and leveraging developments in access to 'Big Data' and the latest data science and AI developments.
3. **Building capacity.** Ministries should consider hiring and maintaining specialists with mastery of modeling tools and methods. This is important for obtaining modeling work that is relevant for the Ministry's needs, but also for efficient communications and using modeling results for policymaking. Knowledge of approaches for 'decision making under deep uncertainty', 'risk–opportunity analyses' (Sharpe et al., 2021), and 'multi-criteria decision analysis' (MCDA) can be especially useful.
4. **Investing in partnerships.** Nationally, Ministries should cooperate with various stakeholders, including experts from different fields and sectors. As Geels et al. (2016) argue, "a research agenda that integrates understanding of the social processes with technical analysis…is necessary to catalyze a transition to a low-carbon world." Securing high-level political and administrative support will also be critical.
5. **Starting simple.** Once the required resources are in place, Ministries can roll out new approaches and tools. Even simple spreadsheet calculations can provide a good start, which can be built on by more complex approaches, backed up by multiple scenarios and sensitivity analyses. (Coalition of Finance Ministers for Climate Action, 2022e)

Real world examples

The Coalition of Finance Ministers has provided a comprehensive overview of current approaches to modeling the fiscal impacts of climate action, including their pros and cons. It includes a review of approaches being spearheaded by a range of countries with involvement or leadership by Ministries of Finance. For example:

- **Chile** has looked far into the economic impacts of options for achieving carbon neutrality under deep uncertainty.
- The **UK** Treasury, in its Net-Zero Review (2021), has undertaken an initial assessment of projected changes in tax revenues over time from going to net zero, albeit only partially identifying alternative sources of revenue.
- **Finland** has taken a deep look into the impacts of environmental tax reform.
- **Denmark's** GreenREFORM Model aims to create a readily available one-stop-shop for consistent assessments of the economic and fiscal impacts of climate policies and the climate impact of economic policies, along with traditional budgetary and fiscal objectives. This project aims to integrate state-of-the-art data on technology costs and comprehensive data from Statistics Denmark's environmental–economic accounts into a dynamic general equilibrium model, addressing some of the shortcomings in previous approaches.

There is now greater recognition that traditional approaches to assessing climate policy impacts are not sufficient guides for future economic and fiscal strategy. Recent analysis, for example, shows that some of the world's greatest successes in low-carbon transitions to date—i.e. where innovation was accelerated, jobs created, and costs and emissions were cut—were achieved by policies generally not supported by traditional analysis (such as cost–benefit analysis [CBA]) or advice (Grubb et al., 2021). These successes include targeted investments in clean technologies, market-shaping subsidies, public procurement, and state-backed concessional lending. At the outset, static CBA considered these investments poor value in terms of dollars per tonne of avoided emissions (given that CBA tends not to effectively consider the potential for declining costs with cumulative investments or the dynamic benefits), but over time they proved highly effective. For example:

- In **India** these types of measures led to the cost of efficient lighting falling by 85% over four years, bringing electric lighting to hundreds of millions of homes for the first time.
- In the **UK** targeted subsidies cut the cost of offshore wind by around 70% in a decade, making it a cheaper source of electricity than gas (Grubb et al., 2021).
- In **Brazil** the share of onshore wind in electricity generation rose more quickly than in any other major emerging economy, creating 150,000 jobs.
- Progress in **Germany** and **China** contributed disproportionately to the cost declines that have made solar power the cheapest electricity in history.

While countries pursued these policies for a variety of strategic industrial, social and environmental reasons, their outcomes in purely economic terms may be considered highly successful (ibid.).

Exciting new approaches to national accounting are also available, driven by Ministries of Finance that are helping countries to redefine their priorities for economic prosperity. These tend to focus on a fundamental reappraisal of the primary benchmarks of economic performance used by Ministries of Finance by going beyond standard GDP metrics to include a wider range of metrics important for human wellbeing and living standards; see Box B25.

Box B25. New national accounting approaches—beyond GDP

Gross Domestic Product (GDP) is recognizable as the headline indicator used by Ministries of Finance around the world to forecast and track changes in a nation's wealth as represented by the value of goods and services produced. It was only after World War II that GDP became the lead method of measuring wealth. Developed during the Great Depression in the 1930s, GDP was initially leveraged by the US and UK as a proxy indicator to determine whether they could afford to go to war. In the decades following WWII, GDP rapidly became shorthand for a country's prosperity and progress. Growing the economy was seen as the main path to world peace; and GDP was the tool of choice to track such growth.

Among its successes, growth in GDP has seen millions lifted out of poverty and considerably reduced child mortality. As economic growth expands a country's tax base, it enables governments to spend more on public services such as health and education. Higher incomes also increase households' ability to pay for goods and services that improve quality of life.

However, the preoccupation with using growth in GDP to broadly represent economic wellbeing has played a major role in driving environmental and social costs, fueling resource depletion, climate change, and rising inequality. In a diverse range of countries sustained increases in GDP per capita have not always translated into improvements in life satisfaction or human happiness (Sachs and Layard, 2019). Simon Kuznets, chief architect of the US national accounting system, who helped develop GDP in 1934, cautioned against equating GDP growth with economic or social wellbeing. As he noted: "The welfare of a nation can scarcely be inferred from a measurement of national income." Yet GDP continues to feature prominently in countries' assessments of their economic progress and prosperity.

Some countries, however, are starting to take a broader perspective on how to further develop and invest in their economies. In 2021, the UN System of Environmental Economic Accounts (SEEA) was officially adopted by the UN Statistical Commission. At least 90 countries have implemented the SEEA, including many Coalition members (OECD, 2022b; SEEA, 2021). Individual countries are making similar moves, e.g. **Rwanda** is developing Green GDP metrics by subtracting environmental costs from traditional national accounting approaches.

Measuring wellbeing is emerging as an approach among some governments to embed a more holistic vision of progress that allows them to integrate, compare and report on what matters most for their society's wellbeing, now and for future generations. This is forming the foundation for wellbeing budgets. The process typically begins by developing a wellbeing framework that maps qualitative and quantitative evidence across social, political, economic, cultural and environmental domains. Over half of OECD countries now have wellbeing frameworks (OECD, 2022b). Well-known examples include **Bhutan's** Gross National Happiness, **New Zealand's** Living Standards Framework, the **Netherlands**' Wellbeing Monitor, **Scotland's** National Performance Framework and **Canada's** Quality of Life Framework. Gender budgeting processes are another emerging approach. The UN is currently developing recommendations for a set of metrics to measure progress beyond GDP to be presented at the 'Summit for the Future' in September 2023.

In addition, more work is looking at the economy's demands on the biosphere, such as the work pioneered by Johan Rockstrom and Earth4All hosted by the Club of Rome. These projects look at the interconnected issues and complex problems faced by humanity to explore different future scenarios on Earth. The increasing awareness of these mutually reinforcing challenges is driving some governments to consider directing their economies toward purpose beyond GDP growth as an end in itself.

The move to shift the way we view and measure prosperity is supported by a host of initiatives: e.g. by the European Commission, World Bank, OECD, UN, Wellbeing Economy Governments Partnership (WEGo), and the Wealth Accounting and the Valuation of Ecosystem Services Partnership. These initiatives provide new or

complementary means of measuring an economy's prosperity, feeding ongoing debate over whether GDP should be improved on, replaced or supplemented. Having a dashboard or basket with a very small and select set of indicators to offer insightful complementary information alongside GDP may well be the preferred compromise for now. These indicators could be released synchronously and in conjunction with GDP figures to create greater understanding of underlying dynamics and trigger the necessary policy debate.

Source: Based on contributions from Renilde Becque (WRI), Amanda Janoo (WeAll) and Samantha Power (World Bank)

Opportunities for action

Ministries of Finance should invest in the right decision-making and analytical approaches in partnership with line ministries to make more effective choices on climate policy and investment, taking into account the limitations in many existing modeling approaches. This should be supported by investments in accessing new forms of data (including real time data) on climate risk and the environmental, social and economic impacts of economic sectors and emerging technologies critical for the net zero transition.

Ministries of Finance should consider:

- **Investing in their in-house analytical capabilities** to assess climate and transition impacts by drawing on a range of tools and approaches. This should include in-house staffing, data and financial resources, including tracking the latest developments in data science and AI.
- **Leading, with key line ministries, country and sector studies** that look in detail at physical climate risks, the costs and benefits of long-term decarbonization and resilience pathways, and the impacts of different policy options, paying particular attention to the specific fiscal implications.
- **Drawing on a range of analytical approaches and tools** with a focus on those that:
  - Address the most pertinent questions they face, especially the fiscal impacts of physical climate risks, the net zero transition, and specific policy options
  - Consider the opportunities to identify new (direct and indirect) sources of tax revenue alongside identifying revenue risks
  - Take into account the shortcomings of traditional general equilibrium and CBA approaches by capturing non-linear climate impacts and non-marginal changes from investments in the net zero, climate-resilient economy
  - Facilitate cooperation and capability-building with lead line ministries, state-owned enterprises, investment funds, development banks and financial sector regulators
  - Are well matched to the capacity of the Ministry and relevant line ministries
  - Build on or integrate into existing in-house modeling and appraisal approaches, where existing approaches are fit for purpose
- **Providing training in dynamic analytical and modeling approaches** to all staff involved in policy design and appraisal, especially to strengthen the interpretation and communication of results and increase understanding of the impacts of climate action on economic transformation.
- **Investing in new indicators of economic prosperity** to avoid GDP serving as the sole or dominant compass on which to base investment and budget decisions or to measure the success of policies.
- **Resourcing statistical agencies, meteorological offices and other data-providers sufficiently** so that they can provide the necessary input into models.

Part C. Priorities for action for Ministers and Ministries of Finance

This part of the report presents an overarching agenda to enable Ministries of Finance to make progress on mainstreaming climate action.

Read this to:

- Understand how the framework from Part B can assist in assessing country-level progress and priorities for action
- Discover principles to navigate trade-offs
- Consider 15 transformative actions across building capabilities and capacities, core policies and working with others
- Find out about the implementation support the Coalition will provide

The need for country-specific approaches

This guide has outlined a wide range of opportunities for Ministries of Finance to drive climate action. All Ministries of Finance will have to prioritize and sequence the steps they take and consider the unique context in which they each operate. The work of the Coalition of Finance Ministers to date has shown that building the capabilities and driving transformational reform across the areas outlined in the guide will be demanding for any Ministry. While a comprehensive approach would be ideal, many may have to take a more gradual, step-wise approach, focused on a few key areas in which they might have the most immediate initial impact. From that point, they can build their action further.

Ministries of Finance tend to differ from one another in several key ways. These include:[56]

- **The level of power they have in relation to other ministries.** Some Ministries of Finance are politically powerful entities with strong technical capacities and capabilities that play a significant role in the economic and financial policymaking agenda (**France**, the **Netherlands** and the **UK** are good examples). Some are less powerful than Ministries of Economy or Planning, and sector ministries such Energy, Transport and Agriculture.
- **The level of responsibility they have for economic and public finance issues.** In some countries, there is more than one ministry charged with finance issues—e.g. **Australia, France, Turkey** and the **US**. Nearly half of countries have separate Ministries of Finance and Economic Planning.
- **The degree of new capabilities they require to take on additional climate action responsibilities.** Many Ministries of Finance lack some of the basic staff levels and skills that could be built upon or repurposed, especially in emerging markets and low-income countries.
- **Their culture of decision-making.** Ministries differ widely in their institutional and cultural characteristics. More 'traditional' Ministries tend to be 'segmentalist', compartmentalizing functions with weak horizontal and vertical coordination. They tend to be short-term, resistant to change, and risk-averse. Others have a more 'integrative' culture, tending to be more encouraging of cooperation and flexible business processes, more open, more communicative, smaller, and to take a broader policy perspective.
- **Their level of flexibility in adopting new tasks and functions.** Countries vary widely in the extent to which ministries have freedom to make changes in their organizational and staffing structures.
- **The structure of economies in which they operate.** This differs markedly depending, for example, on the sources of emissions and vulnerability to climate impacts. Countries that are more exposed to natural disasters naturally will give greater attention to fiscal measures to tackle these events. Countries with highly carbon-intensive energy systems naturally will want to give greater attention to measures to decarbonize energy and transportation systems.

[56] Based on Allen et al. (2015, 2016) and additional contributions by Richard Allen.

- **The level of power central government has in relation to other regions.** In federally organized states, Ministries of Finance are likely to have less budgetary autonomy than in unitary states.

These differences mean that the scope for rapid organizational change will differ markedly across countries. The experiences and work done to date under Helsinki Principle 2 and interviews that informed this guide demonstrate that first and foremost, transformational change will depend on the degree of political priority attached to climate policy and the strength of political and senior leadership, and on climate governance arrangements. To some degree this helps to determine the availability of financial resources and technical assistance to support reform. However, differences in the characteristics described above also matter greatly.

Accurate identification of these characteristics is fundamental to determining appropriate organizational reform strategies. For example, where organizational segmentation is strong, the establishment of crosscutting teams with representatives from relevant departments and units can be especially useful to help drive reform. Where there are strong skills gaps, more flexible salary structures to attract specialized or scarce skills might need to be considered. Where there is a weak track record of organizational reform, change management strategies can be developed to manage the risks associated with restructuring. This might initially lead to incremental, but still important, changes to existing units, functions and responsibilities of the Ministry rather than changes to the whole structure.

Assessing progress and priorities

Although there is no one-size-fits-all solution, a core set of considerations can help Ministries of Finance to set priorities for strengthening their functions and enhancing their capabilities to respond to climate change. They can take a step-wise approach towards full mainstreaming, as outlined in Figure C1.

Figure C1. Mainstreaming climate action into Ministry of Finance (MoF) functions and capabilities—a vision for the future

Source: Authors' depiction. Adapted from Orozco and Jaramillo (2021)

The following are some example questions that Ministries of Finance can use in their initial self-assessment (see Stage 1 in Figure C1) and to determine their progress and further areas to prioritize as they move along the path toward fully mainstreaming climate action (Stages 2 and 3).

Determining the nature of the challenge

- Does the Ministry have sufficient understanding of:
  - The key sectors that will need to be transformed for the net zero, climate-resilient transition?
  - The key risks and opportunities, including potential economic, social and environmental co-impacts and physical and transition risks in each sector and for the economy as a whole?

Prioritizing efforts across functions and capabilities

- Does the Ministry have sufficient understanding of the relevant policy areas within its remit, in which it will need to play a role in addressing these risks and opportunities and delivering the transformation to a net zero economy?
- Has the Ministry taken action to mainstream climate into these policy areas? In particular:
  - Function 1: Has the Ministry been involved in developing strong national climate plans (including LTSs, NDCs and NAPs) and sector and/or industrial policies to support the transition? Are these strategies and plans linked to national development and investment planning?
  - Function 2: Is the Ministry using the budget, wider public financial management system and procurement processes to drive investment in the transition? Is the tax and subsidy system designed to accelerate climate action, including through the use of new measures such as carbon pricing and fiscal incentives for key sectors? Has a robust review of the overall tax system for compatibility with delivering on Paris commitments been considered?
  - Function 3: Has the Ministry given consideration to the different sources of finance, as well as the role of the overall financial system in financing the transition? Are steps being taken to green public-financing institutions, and to work more closely with central banks?
- Does the Ministry have sufficient understanding of the capabilities needed to deliver on the key functions? Has it taken action to mainstream climate into key capabilities, including:
  - Capability 1: Do the Ministry's mandate, mission and vision, organizational strategy and institutional set-up enable engagement on climate change?
  - Capability 2: Is the Ministry represented in key government climate coordination mechanisms and does it have systems in place to consult and coordinate with key external stakeholders?
  - Capability 3: Has the Ministry assessed existing and required knowledge and expertise, models, tools and data to support decision-making processes?
- What are the areas in which immediate progress can be made? What will need to be considered over a longer time period?

Further questions can be used to help prioritizing within functions and capabilities. A full list of diagnostic questions for each function and capability will be developed as a follow-up product to this guide.

Irrespective of effective mechanisms to prioritize efforts by Ministries of Finance, progress can be made, even in resource-constrained environments.[57] There is a common perception that some Ministries may not be able to make strong immediate progress due to capacity and resource constraints. However, the work for this guide has demonstrated that Ministries even in the lowest-income countries have been able to demonstrate remarkable leadership and innovation.

[57] Based on contributions by James Brumby (World Bank).

There are at least three further reasons to remain optimistic about the potential for progress:

- **Reform is not a linear process**. Yet, whether thought of as 'working with the grain' or 'iterative adaptation,' there is considerable evidence to suggest that marshalling sufficient resources to make a discernible difference even in resource-constrained environments is possible. Fritz et al. (2014), for example, found that strengthening PFM in fragile states is possible and can happen quite quickly. Part of the reason for this is that the critical path of some reforms does not necessarily involve other reforms, or it relies on different human and systems capacity from other functions.[58]
- **A considerable degree of constraint on capacity may be due to the poor use of that capacity.** Accordingly, a reform program can address both the supply of capacity and the design of processes to make better use of that supply. One way to do this is by matching competencies on the supply side with those required on the demand side.
- **Evidence in other work suggests that quite often, capacity will follow shifts in political leadership and/or a change in the authorizing environment.** Even in resource-constrained environments, capacity typically develops if the commitment to the reform program is credible. And while there may be issues at times with the domestic political or senior internal commitment to the climate agenda, the external environment in the climate space is rapidly evolving, such that waning commitment will likely become less and less optional.

[58] For example, improving the ability to forecast systemic macro risks will likely involve different capacities from those involved in negotiating a line ministry's budget. Similarly, creating a climate hub or centre of excellence in understanding climate will not necessarily suck resources from key pre-existing functions, including functions such as routine budget execution and accounting.

Navigating trade-offs[59]

Effective prioritization also means managing trade-offs. This is a core component of decision-making in Ministries of Finance. Resources are limited, uncertainty is high, and policy options are plentiful. Sometimes, advancing progress on climate goals might seem to come at the cost of deprioritizing other development needs, such as health and education. Sometimes these trade-offs are real; at other times there are opportunities to make progress on multiple objectives concurrently. This defines the process of mainstreaming climate into economic decision-making.

Climate action typically forces policymakers to confront trade-offs on 'substance' at two levels:

- At the *macroeconomic* level—balancing the achievement of a wide range of priority objectives such as economic growth, equity, job creation, health and education outcomes, reducing emissions, enhancing resilience, energy security and protection of the public finances; and
- At the *policy* level—determining the best policy mechanism to deliver these objectives on the basis of effectiveness, efficiency, equity and other relevant criteria. In the case of reducing emissions, this might include determining the balance of public versus private investment, the use of carbon taxation versus emissions trading systems, or the use of untargeted versus targeted cash transfers to support vulnerable groups in the transition.

In public policy analysis, the concept of 'dominance' describes situations where one policy is better than all others in delivering objectives based on relevant criteria—but dominance rarely occurs. Other considerations often come into play for ministers and senior officials, including 'political feasibility' determined by short-term versus long-term impacts, ease of communicating the message, and ability to get Cabinet colleagues on board. They can also include 'administrative feasibility' and 'legal feasibility.' Whereas economists and technocrats often focus almost solely on 'substance', these other aspects tend to be even more important for policymaking where the reality is that there is often just too much evidence out there for decision-makers to consider. This results in resorting to shortcuts, such as relying on a few targeted pieces of research or the views of powerful actors and lobbyists, rules and norms, party lines, or ideological beliefs. It also means that a change in administration can shift everything onto a different track.

Despite the complex constellation of factors influencing decision-making, ministers and senior officials can follow several core principles to help them navigate the trade-offs they face. Most important is to recognize that in many cases 'perceived' trade-offs of supporting climate progress in policy can be very different to 'actual' trade-offs. This is not to say that all climate actions can generate 'win–wins'. There are real and genuine trade-offs in sectors such as land-use where there are very strong confluences of competing uses. There are often intertemporal trade-offs, particularly related to financing climate actions whereby the short-term costs are often more sizeable than alternatives. It is also not to say that ministers and senior officials do not have a complex set of considerations when weighing up different spending priorities between, say, climate action and investing in more immediate day-to-day spending priorities such as waste collection, health or education. But it *is* to say that the solution space for generating win–wins is often far wider than is commonly accepted.

Core principles for decision-making that can be helpful for Finance Ministers to consider when confronting trade-offs, whether perceived or real, include:

- **Search for synergies before focusing on trade-offs.** The long-term benefits of climate-positive policies are often underestimated, as are the negative consequences of traditional fossil-heavy interventions (Ekins and

[59] This section has especially benefited from the input and advice of Brian O'Callaghan (Oxford Smith School), Jim Brumby (World Bank), and Himanshu Sharma (UNEP).

Zenghelis, 2021; Rising et al., 2022). Adopting a win–win mindset, mainstreaming climate into economic policy means designing programs across sectors and ministries that meet development objectives while also capturing climate benefits. For instance, if building a new school, Ministries of Finance might suggest using green materials, installing solar panels, and making the design resilient to changing climatic conditions. If subsidizing smallholder farmers, they might suggest higher subsidies for farmers who are supporting regenerative agriculture and sustainable use of fertilizers. Climate synergies exist across all sectors and in all countries—Ministries of Finance can signal to line ministries that finding these synergies is essential. Identifying the co-impacts (co-benefits and adverse side-effects) can be especially useful (Cohen et al., 2021). This approach can help to provide the knowledge base to plan interventions that realize win–win opportunities and contribute simultaneously to multiple objectives.

- **Do not let uncertainty quench ambition; consider the risks from business-as-usual.** In countries where competing narratives on climate exist, Ministries of Finance should act in-line with the precautionary principle[60] and not let disagreements on the fine details of future forecasts prevent them from acting on overall trends: that is, they should not let uncertainty be an excuse for inaction or under-investment. Rather than asking, 'Can I afford to act on climate?', ministers can instead be encouraged to ask, 'Can I afford not to?' They should give equal consideration to the risks from business-as-usual, despite the uncertainties. This could include identifying the risks from higher public expenditures for reconstruction, disaster relief and write-downs of stranded assets, and the impacts on competitiveness for late movers.
- **Revise outdated assumptions.** Climate policy decisions are often made using obsolete information and data. The pace of technological innovation in many green sectors has been staggering (Way et al., 2022), demanding a humble approach to any decision-making that incorporates technological and cost assumptions (see Aghion et al., 2019). For example, residential solar panel system costs dropped 64% over the period 2010–20 and utility-scale costs by 82% over the same period (Feldman et al., 2021), yet many policymakers continue to cite cost arguments from the 2000s to suggest that solar power should be limited. Since climate technologies, adoption rates and investment continue to surprise on the upside (more progress than expected), shrewd Ministries of Finance might also ensure that policy designed today has the scope to capture unexpected upsides, including incremental strategic competitive advantages in frontier industries. Ministries of Finance should continually seek the most updated information relating to climate technologies and policies, being careful to avoid prevarication a either the positive or negative direction (McLaren and Markusson, 2020).
- **Account for second- and third-order impacts.** The positive impacts of climate interventions and the negative impacts of traditional policies on a domestic economy are often underestimated. In part, this appears related to a failure to account for the second- and third-order impacts of these interventions. For example, an investment in new wind-powered electricity generation is likely to immediately create jobs and boost GDP, often doing so more effectively than traditional investments (see O'Callaghan et al., 2022). In some nations, it could also enable electrification of new communities. Second-order effects could include cheaper electricity for households, a stronger domestic renewables industry, and in the case of new electrification, more productive hours for households. Third-order benefits could include economy-wide productivity gains, leading to higher tax income and therefore greater fiscal space to enable other investments.
- **Standardize criteria for ex-ante impact assessments.** Ministries of Finance need to consider each policy decision in relation to their other decisions and government priorities. This way, when trade-offs are necessary, policymakers can ensure that when considering net impacts, every priority is advanced. Criteria for making assessments should include some that are ministry-specific, based on sectoral mandates, and others that are applied universally across the government, defined by national priorities and international commitments.

[60] Article 3 of the UNFCCC establishes that "Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects." This precautionary principle rejects the claim that uncertainty related to physical climate impacts or the pace of technological development justifies inaction.

Other supporting principles that can be useful to facilitate decision-making include:

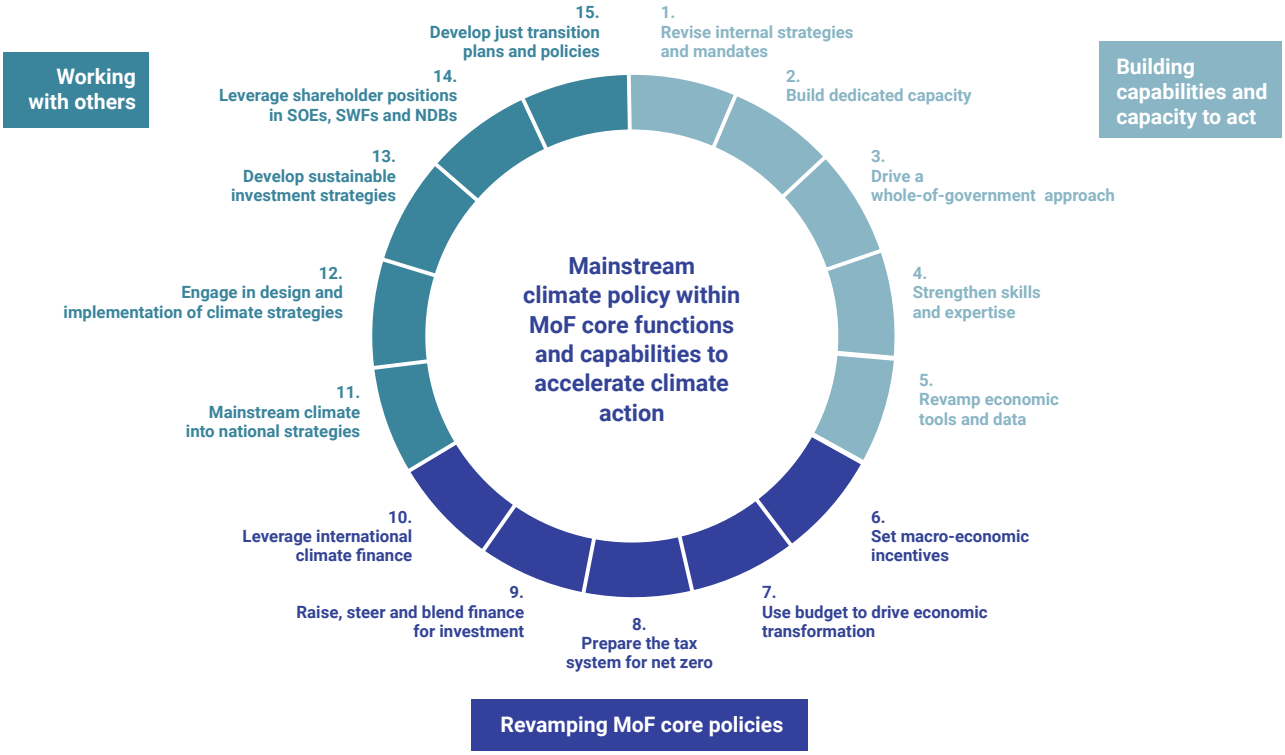
- **A focus on outcomes,** not on alternatives. Focusing on outcomes—such as tonnes of carbon abated, dollars of economic impact, jobs created or lost—taking into account second- and third-order impacts, can give policymakers direction when crafting policy. It helps to understand what they are trading off against with one policy versus another. This process can be made easier by using an outcomes matrix that visualizes the different outcomes of a policy across different dimensions.
- **Considering ranking rather than rating options.** Where outcomes are difficult to quantify, it can be better to consider them in terms of better and worse, i.e. ranking rather than rating different policy options. This can be a useful exercise when the budget constraint is uncertain and gives policymakers a general idea of which policy is better than another. The use of enhanced economic modeling tools using multiple scenarios or multi-criteria analysis can support this process (see Capability 3b).
- **Using a questioning approach.** Starting with emerging decisions related to a particular policy or budget allocation decision, officials laying the foundation for the decision can keep asking each decision-maker involved, 'Why is that important?', until they reach the bedrock motives, interests and needs of each party involved. This can help to expose any contradictions and false trade-offs, and inform the emergence of clear priorities.

A range of emerging decision-support tools are emerging that can help Ministries of Finance navigate trade-offs, drawing on a number of these principles. The Sustainable Budgeting Approach (SBA), for example, is specifically designed to help policymakers navigate trade-offs in mainstreaming climate into budget processes (see Function 2c).

A call to action for Ministries and Ministers of Finance

As a result of the sum of the work informing this guide, we have identified 15 transformative actions for Ministries of Finance to take. If embraced by Ministries around the world, they can help to ensure the implementation of the Helsinki Principles and send a strong signal that the global economy is poised to follow a low-carbon, climate-resilient path.

15 transformative actions for Ministries of Finance



Building capabilities and capacity to act

By reforming and enhancing their own capabilities, Ministries of Finance can go faster and further in driving climate action across the core functions identified above. They can do this through:

1. **Dedicated Ministry of Finance strategies and strengthened mandates for climate action.** Organization-wide plans can help Ministries of Finances set concrete objectives and priorities and marshal internal resources to play a more active role in driving climate action internally and across government. Explicit mandates for driving climate action could come from legislation, the Government's overall program, or organizational strategy development processes.
2. **Building dedicated capacity for climate action.** This could include defining clear senior-level responsibilities for driving climate action, investing in new collaboration processes, and appointing designated staff as climate focal points. Where resources permit, dedicated climate change units could be established, combining redeployment of existing staff and recruitment of new experts.
3. **Active engagement in inter-agency and stakeholder coordination efforts.** Ministries of Finance are well positioned to drive a whole-of-government-and-economy approach to climate policy. At a minimum, they should identify the areas requiring collaboration and participation of the Minister and Ministry of Finance in existing inter-ministerial coordination mechanisms and provide dedicated resources accordingly. They should also help to develop strong relationships and multi-stakeholder platforms with the private sector and civil society.
4. **Investing in skills and expertise.** All staff should have awareness and understanding of climate issues, while specialist staff will need skills spanning climate economics, risk management, green fiscal policy and green finance, plus sectoral expertise. This can be achieved through in-house training, recruitment, peer-to-peer networks, engaging with academia and other knowledge providers, and leveraging expertise from other agencies. Ministries of Finance can start by assessing climate-related skill gaps and developing training and hiring plans.
5. **Revamping economic tools, data and decision-making approaches.** New tools and data are needed to better assess the costs, benefits and fiscal impacts of zero-carbon, climate-resilient economic development pathways and investments. Overcoming the shortcomings of traditional general equilibrium and cost–benefit analysis using a diversity of approaches that capture non-linear climate impacts, non-marginal changes in the economy, and use scenario analysis is especially important. Utilizing cutting-edge data science and exploring new indicators of economic prosperity should be considered.

Core policies

Ministries of Finance should focus on the policy areas in which they can have the most significant immediate impact based on their primary responsibilities. This should include:

6. **Introducing fiscal policies to transform macroeconomic incentives for climate action.** Ambitious carbon pricing schemes and subsidy reforms should be introduced, supplemented by other fiscal incentives and regulatory reforms to transform the key economic systems required for the zero-carbon, climate-resilient transition. Ministries of Finance should contribute to ensuring coherent policy packages that capitalize on the strong interactions between pricing and non-pricing instruments while avoiding contradictions.
7. **Using the budget and public financial management to drive transformation in all sectors of the economy.** By making it clear in the budget and medium-term expenditure framework that climate is a national priority, this is perhaps the most critical entry point for driving climate action across all government departments and reducing the risks and cost of capital for the private sector. This should build on existing public financial

management processes so that climate action is mainstreamed throughout the entire budget cycle and that detailed line ministry budgets fully reflect government climate priorities and include aligning public investment management and procurement practices with climate objectives.

8. **Redesigning the tax system for net zero and climate resilience.** Ministries of Finance could undertake a detailed review of the entire tax system as the foundation for reform. This might include considering new forms of environmental taxation, motoring taxes, road pricing, property and land taxation and reforming general taxation. Ministries of Finance should also be able to comprehend the impacts that climate-related risks might have on the economy and public finances, including through identifying and planning for known and unknown contingent liabilities.
9. **Raising, steering and blending finance for investment at unprecedented speed and scale.** Ministries of Finance should consider domestic revenue mobilization to underpin national investment in the transition through broadening the tax base, the responsible use of green and other thematic bonds for investment, and enhancing sub-sovereign finance. This should be complemented by the development of comprehensive sustainable finance roadmaps that include measures for greening the entire financial system to make finance flows align with the Paris Agreement and Kunming-Montreal Global Biodiversity Framework, the use of disclosure mechanisms and transition plans, the provision of disaster risk financing and insurance for all, and use of blended finance and country platforms to help aggregate investment pools.
10. **Leveraging international climate finance.** In relevant countries, Ministries of Finance should work with Foreign Affairs Ministries and development agencies to develop dedicated climate finance strategies to attract international climate finance. All Ministries of Finance should call for enhanced support for climate action by the regional and multilateral development banks through building coalitions for increasing finance and reducing the cost of capital. Shareholders and other countries should encourage an increase in international climate finance, especially concessional finance and finance for adaptation.

Working with others

These measures should be complemented by building strong partnerships with other government agencies and stakeholders across a suite of broader policy areas. Priorities for proactive Ministry of Finance leadership and engagement include:

11. **Mainstreaming climate action into national growth and development strategies.** It is critical that climate action and sustainable economic development are considered together. Ministries of Finance should work with relevant line ministries to help integrate climate action into national development plans and sector strategies related to energy, transportation, cities, land use, industry, and water. This should include considering the greater use of 21st century industry and innovation strategies to manage and invest in the transition to net zero.
12. **Active engagement in national climate strategies.** This should include proactive leadership by Ministries of Finance in the development and implementation of Nationally Determined Contributions, Long-Term Strategies and National Adaptation Plans and should support other agencies to develop fully costed strategies as the basis for attracting public and private investment.
13. **Developing sustainable, inclusive and resilient investment strategies.** Ministries of Finance can work with other agencies and private sector stakeholders to assess economy-wide and sector-specific investment needs, identify steps for overcoming impediments to investment, determine potential financing splits, and build mechanisms for translating investment planning decisions into concrete programs and pipelines of projects, including through the budget and public capital investment planning.
14. **Driving the green transformation of state-owned enterprises, national development banks, and sovereign wealth funds in cooperation with central banks.** Ministries of Finance can use their supervisory or

shareholder positions to green state-owned enterprises, national development banks, and sovereign wealth funds. They should work with central bank governors to refresh their remits on monetary policy and financial stability to drive climate action and explore opportunities for fiscal and monetary policy coordination, while avoiding encroaching on central bank independence.

15. **Developing just transition plans and policies.** Ministries of Finance can work with other agencies to develop just transition plans for all key sectors of the economy, ensure climate policies consider potential positive and negative social impacts and that all citizens are included in decision-making and benefit from the transition. They should give particular attention to the creation of green jobs, reskilling of workers, and regeneration of areas phasing out fossil fuel production.

Coalition of Finance Ministers for Climate Action implementation plan

The Coalition of Finance Ministers is committed to supporting its members to implement the actions described in this guide and ways it might do so include:

1. A program of strategic engagement among its members and beyond to enhance *awareness and recognition* by Ministers of Finance, other relevant Ministries, and more broadly about the important role they have to play in driving climate action and the concrete actions needed to mainstream climate within their core functions and capabilities, efficiently and effectively.
2. Enhanced *training and technical assistance programs* for Ministries of Finance, starting with the programs offered or being designed by the Coalition's Institutional Partners, including the World Bank, IMF, World Resources Institute, NDC Partnership, UN Family, development partners and academia.
3. Developing *knowledge and research partnerships* of relevant actors to ensure the accessibility of high-quality analysis and research to Ministries of Finance, taking inspiration and benefiting from existing networks and practices.
4. Deepening *awareness and dialogue on implementation of the guide* using regional workshops or country 'roadshows' targeted at political leaders, Finance Ministers, senior management teams and staff, and relevant partners.
5. Organizing *global or regional debates* with stakeholders in areas of contestation to enhance global consensus around the important role of Ministries of Finance in driving climate action.
6. Receiving *ministerial feedback and sharing of experiences* on how to make progress in strengthening the role of Ministries of Finance and their engagement in global climate processes using the late 2023/early 2024 Ministerial Meetings.
7. Supporting *engagement of Ministries of Finance in national and global climate processes* in the run-up to COP28 on climate and COP16 on biodiversity.

The important point is for Ministries of Finance to develop strategies for mainstreaming climate action within their core operations, recognizing that short-term and long-term efforts are needed. Developing such plans will benefit from close collaboration with other Ministries, relevant agencies and partners. It is important to step up efforts now on priority actions.

There is no time to lose; the impacts of climate change are escalating and acting sooner will drive significant benefits.

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Part D. Appendices

Appendix 1. The central role of Ministries of Finance in relation to other actors in driving climate action

This table presents a non-exhaustive list of policies that will typically require Ministry of Finance (MoF) leadership or involvement. It gave rise to some of the summary tables and diagrams included in the main part of the guide but because it adds extra detail, it does not align with those completely. Green shading indicates where co-leadership between Ministries of Finance and relevant line ministries such as Water, Energy, or Transportation is likely to be needed, usually pertaining to the design of sector-specific fiscal incentives. Grey shading indicates leadership by either the MoF or relevant line ministry. An 'X' in a box indicates a leading role; a blank box indicates no leading role.

Development goal	Policy approaches	National policies	Type of intervention: Fiscal (F) Regulatory (R) Information (I) Governance (G)	Leading role for MoF incl. with other finance agencies (assessment based on whether measure has direct fiscal implications)	Leading role for line ministries (non-financial) supported by MoFs (incl. through the budget)
Cross-cutting macro and fiscal policies	Transform economy-wide incentives	• Establish carbon pricing or taxation	F	X	
		• Remove fossil fuel subsidies	F	X	
(Selected examples)	Reform budget processes	• Revise budget preparation process to incorporate delivery on national development and climate strategy	R*	X	
	Reform government procurement	• Green government procurement systems (incl. to reduce footprint of government building stock)	I; F	X (NB, may be central procurement agency)	
Transform cities	Spatial planning	• Establish national urban spatial planning frameworks that promote compact, connected, clean cities • Promote compact cities through public service, housing, and infrastructure provision	R* F		X X (incl. through budget)
	Reform urban development tax and regulatory incentives	• Implement national property and land tax reforms to encourage liveable density, with a focus on design rather than implementation	F	X	
		• Revise fiscal and regulatory incentives favoring less dense/sprawled development	F	X	X
Low-carbon transportation	Multi-modal mobility planning and infrastructure development	• Establish national mobility policies	R*		X
		• Fund low-carbon and accessible transportation infrastructure incl. for EVs, cycling, and walking	F	X	X (incl. through budget)
		• Align national infrastructure spending priorities with multi-modal transportation goals	F		X
	Align pricing incentives with multi-modal transportation goals	• New forms of taxation on private vehicle ownership	F; R	X	
		• Fiscal incentives for use of public transportation modes, incl. to reach underserved populations	F	X	X
	Promote vehicle efficiency and clean, secure, affordable energy alternatives	• Enact fuel efficiency and alternative vehicle standards	R		X
		• Provide fiscal incentives for fuel efficiency and alternative vehicles	F	X	X
		• Enact low-carbon fuel standards	R		X
		• Fund charging infrastructure for cleaner vehicles and fuels	F		X (incl. through budget)
		• Implement fuel economy labeling for vehicles	I		X
		• Provide national driver training programs	I		X
	Optimize freight transport efficiency	• Establish national freight transportation planning and logistics policies	R*		X
		• Provide fiscal incentives or requirements for freight transportation mode shifting and optimization	F; R	X	X
		• Fund alternative freight infrastructure (e.g. rail)	F		X (incl. through budget)

Efficient buildings	Promote energy-efficient design of new buildings	• Establish national building codes for enhancing energy efficiency and climate resilience	R		X
		• Establish building energy certification and labeling programs	I		X
		• Provide fiscal incentives for efficient building design and construction	F	X	X
		• Ensure low-carbon energy sources are included in national building energy codes	R		X
	Promote energy-efficient renovations and retrofits of existing buildings	• Ensure building retrofit measures are included in national building energy codes, building energy certification and labeling programs, and incentives for efficient building design and construction	R		X
		• Establish energy efficiency funding programs	F		X (incl. through budget)
		• Adopt utility sector regulations and reforms to promote energy efficiency	R; G		X
	Encourage use of energy-efficient appliances, equipment and lighting	• Set minimum energy performance standards (MEPS) for appliances, equipment and lighting	R		X
		• Establish appliance energy efficiency labeling programs	I		X
		• Provide fiscal incentives purchase of energy-efficient technologies	F	X	X
Energy transition		• Provide fiscal incentives for purchase of distributed energy resource technologies	F		X
		• Adopt utility sector regulations and utility reforms to enable local energy systems (incl. reaching underserved)	G		X
		• Fund national and local energy supply projects	F		X (incl. through budget)
Efficient waste management	Promote integrated sustainable waste management	• Adopt utility sector regulations and utility reforms to enable local energy systems (incl. reaching underserved)	R*		X
		• Fund national and local energy supply projects	F		X (incl. through budget)
	Encourage waste prevention	• Enact extended producer responsibility policies	R		X
		• Enact policies to discourage or limit unnecessary waste	R		X
	Increase waste collection and recycling	• Establish national waste collection, recycling and circular economy goals	R		X
		• Provide funding, subsidies and incentives for waste management and recycling facilities	F		X (incl. through budget)
		• Design and implement taxes or levies on products to cover recycling and safe disposal	F	X	X
	Promote recovery of landfill gases and energy from waste	• Create landfill gas capture and utilization standards	R		X
		• Fund landfill gas energy and waste-to-energy infrastructure	F		X (incl. through budget)
		• Modify utility sector regulations to enable feed-in from landfill energy sources	G		X
Agriculture and land use	Avoid deforestation and degradation	• Laws to protect indigenous rights	R; G		X
		• Strengthen and expand protected areas	R; G		X
		• Introduce transparency laws around supply chains based on forest products	R; G		X
		• National programs for REDD+, incl. fiscal incentives for protecting standing forests and investing in alternative livelihoods	R*; F		X (incl. through budget)
	Reforestation and boosting agricultural productivity and yields	• National land use plans for reforestation	R*		X
		• Fiscal incentives for reforestation	F	X	X
		• Establish outgrower schemes and extension services for smallholders	R*		X (incl. through budget)
		• Support research, development and demonstration (RD&D) for new varieties and seed banks	F		X (incl. through budget)
		• Fiscal incentives for better soil and water management	F	X	X
Industry and services		• Fiscal incentives for national industrial energy efficiency	R*; F	X	X
		• Review and reform of taxation and royalty schemes for extractive industries	F	X	
		• National 21st century industrial strategy with macro and performance-based incentives for growth sectors and clusters	R*; F		X
		• Support RD&D for hard-to-abate sectors and new green industries	F; I		X (incl. through budget)
Innovation	Drive RD&D of low-carbon technologies	• Support RD&D of low-carbon technologies	F; I		X (inc;. through budget)

Adaptation and resilience	Water management	• National water allocation policies that establish the full cost of water and monitor water use	R*		X
		• Fiscal incentives for water conservation (e.g. water pricing/watershed payment schemes)	F	X	X
		• Land zoning and buffers for areas at significant risk from climate hazards	G		X
	Identifying and responding to climate hazards	• Funding for early warning systems and improving weather information	F; I		X (incl. through budget)
		• National programs for informal settlement and WATSAN infrastructure upgrading	R*; F		X (incl. through budget)
		• Set policies for regulation and disclosure by private sector of physical and transition risks	F: I	X (usually with other central financing agencies)	
		• Design new financial and insurance products with industry for enhancing resilience (e.g. weather-based insurance for small holders)	F	X	X
		• Establish national disaster reconstruction and recovery funds with contingent credit lines	G; F	X	
Just transition measures	Dedicated examples NB: policy measures above should also take into account social considerations in their design to ensure political support and effective implementation	• Fund national retraining, skill development, and relocation programs for relevant sectors	R* / F		X (incl. through budget)
		• National regeneration programs to attract new investment and jobs in impacted areas	R*; F		X (incl. through budget)
		• National social protection and security programs for impacted communities and workers and to enhance energy and food security	R*; F		X (incl. through budget)
		• National plan for integration and inclusion of marginalized groups, incl. women, indigenous peoples, ethnic minorities	R*		X (incl. through budget)
Other measures	Inter-governmental fiscal and financial capacities	• Reform regional and local fiscal powers to unlock new resources for climate action	G; F	X	X
		• Boost municipal creditworthiness to enhance sub-national investment in sustainable infrastructure	R		X
		• Revise fiscal transfer rules to provide additional grant transfers for climate action	F; G	X	
		• Build local government capacities on finance and revenue generation (incl. for smaller cities)	I		X
	Empower local governments with appropriate legal authority	• Devolve authority to local governments to manage low-carbon initiatives	G		X
	Enhance metropolitan coordination to encourage well planned cities	• Legally require metropolitan governance and coordination	G		X
		• Provide incentives for metropolitan governance and coordination	F; G		X
	Provide data, information and benchmarking	• Establish low-carbon development data programs	I		X
	Build local administrative and technical capacity for low-carbon development	• Provide low-carbon planning tools for local governments	I		X
		• Facilitate training opportunities relating to low-carbon development	I		X
		• Facilitate peer learning opportunities	I		X
	Enhance public education, stakeholder engagement, and government leadership	• Build capacity in public and stakeholder engagement	I		X
		• Build capacity in promoting sustainable behaviors incl. public health campaigns (incl. in low-income regions)	I		X

Notes: R = Regulatory tools; F = Fiscal tools; G = Governance reforms; I = Information and capacity-building. R* = National frameworks that are primarily regulatory tools but typically address all four factors (R, F, G and I).

Source: Authors, drawing on expert advisory group input, Coalition of Urban Transitions (2019), New Climate Economy (2018), Global Commission on Adaptation (2019)

Appendix 2. Key entry points for mainstreaming climate action in budget formulation

Timing (indicative)	Typical budget cycle activities (MoF and line ministries)	Examples of entry points for mainstreaming climate action	Responsible stakeholders
PHASE 1: STRATEGIC BUDGET PREPARATION PHASE			
12 months before budget	Budget framework paper (BFP) on medium-term strategic policy priorities	BFP should highlight the government's key specific and crosscutting climate change issues/strategies	MoF (with line ministries and other stakeholders)
	Update to macro-fiscal framework (incl. medium-term fiscal framework [MTFF]) based on recent GDP forecasts and latest revenue/expenditure/financing forecasts and fiscal risk framework	MTFF should incorporate analysis of macro-fiscal impacts of climate change and fiscal risks arising	MoF
	Independent opinion on fiscal strategy parameters and fiscal risks	Opinion should include assessment of fiscal impacts and risks related to climate change	Fiscal Council/MoF
	Adoption of revised medium-term policy priorities and initial fiscal parameters incl. the MTFF to guide sector plan updates and budget policy formulation	MTFF/medium-term budget framework (MTBF) should include guidance/reconciliation of overall and specific climate change/green transformation fiscal and budget policies/measures incl. those related to revenue and financing	Cabinet and MoF (in partnership with line ministries and other stakeholders)
10 months before budget	Issuance of revised policy priorities and fiscal parameters, incl. draft MTBF for Ministries, Departments and Agencies (MDAs) to enable updating of sector strategic plans incl. investments and activities of other entities such as SOEs	MoF Budget Framework Paper should outline overall policy priorities/fiscal measures related to climate change/green transformation for sector working groups/line ministries (LMs) to consider when developing strategic plans (ongoing and new), incl. financing/funding envelopes	MoF
8 months before budget	Review of previous and current years' plan/budget execution (policy efficiency, effectiveness, and impact)	MoF and LM responsible for climate change strategies should disseminate methodologies and analysis for LM assessment of implementation and impact of current climate change policy measures	MoF (in partnership with LMs and other stakeholders)
	Submission of draft updated sector strategic policies, plans, resource requirements, incl. prioritized ongoing and new investment projects/other measures to MoF	Establish key climate change related outcomes, priorities, outputs, performance indicators and targets to be achieved for each type of policy measure and resources required	LMs and SWGs
	Review of sector strategic plans, incl. investment plans for consistency with MTFF, MTBF and policy priorities	Determine between MoF and SWG/MDAs of extent to which strategic plans and actions are consistent with overall climate change strategy and available resources	Joint leadership – between MoF and LMs
7 months before budget	Updated macro-fiscal forecast, incl. impact of any proposed revenue measures	Consolidation, analysis and revised assessment of impact of proposed climate change/green transformation actions	MoF
	Fiscal and budget strategy paper review and submission	Review of consolidated plans for climate action	MoF/Fiscal Council
	Adoption and approval of fiscal and budget strategy and investment plans	Review and approval of fiscal measures related to climate action	Cabinet
6 months before budget	Prepare budget circular, incl. binding ceilings	Include resource allocations and financing (capital/recurrent/other) to support climate actions	MoF
PHASE 2: DETAILED BUDGET PREPARATION PHASE			
6 months before budget	Mid-year review of current budget and previous year's financial statements	Update assessment of current climate change policy measures and resource utilization against performance indicators and reformulate as needed to enhance impact	MoF (in partnership with LMs and other stakeholders)
	Audit report on previous year's annual accounts and financial statements		Auditor General
4 months before budget	Submission of draft budgets, for achieving agreed priority policy outcomes within agreed resource envelopes	Prepare specific annual and multiyear budgets (capital and recurrent) that aim to facilitate implementation of climate change strategies and policies agreed during strategic budget phase	Joint leadership between MoF and LMs
3 months before budget	Budget hearings (incl. discussion with international partners)	MoF and LM discussion of extent to which detailed plans and budgets are consistent with agreed climate change strategies and policies	Joint leadership between MoF and LMs

Timing (indicative)	Typical budget cycle activities (MoF and line ministries)	Examples of entry points for mainstreaming climate action	Responsible stakeholders
2 months before budget	Finalize budget proposals and documentation, incl. updated MTFF (incorporating any revenue measures) and Fiscal Council opinion	Incorporate budget commentary on climate change implications, proposed strategies and policies, specific measures to be adopted and resource allocations to support implementation	MoF/Fiscal Council
Budget release	Submission, review, and adoption of budget	Legislative review discussion and approval of climate change actions within agreed budgetary and resource framework	Legislature
PHASE 3: BUDGET EXECUTION AND REPORTING PHASE			
Debt and financing framework	Development of efficient financing strategy based on MTFF and MTBF, long-, medium-, and short-term financing requirements, and cash flow forecasts and instruments accessible in financial markets	MoF to develop a sustainable funding plan that considers volume and timing of proposed investments and other climate change financing requirements consistent with ongoing commitments, and sustainable debt portfolio and financing framework	MoF, central bank and Debt Management Office
Cash flow forecasting and release of funding	Forecast of short- to medium-term revenue, expenditure flows and resultant financing/cash buffer requirements consistent with overall financing strategy	MoF to establish reliable plan for ensuring budgeted funds are available for release to support proposed climate change policy measures and investments when required	Joint leadership between MoF and LMs
Budget execution (resource mobilization commitment, procurement)	Effective systems to provide for efficient resource mobilization and budget execution, particularly re. investment appraisal and selection, procurement and contracting, grant distribution, etc.	MoF to ensure budget execution system enables effective implementation of climate change policies (investment, regulatory, subsidies, grants, loans, etc.)	Joint leadership between MoF and LMs
Account-ing and performance monitoring	Effective financial management systems that support tracking of revenue/expenditure/ financing transactions using recognized classification standards reporting principles (i.e. Government Fiscal Statistics [GFSM] 2014, and International Public Sector Accounting Standards [IPSAS])	MoF to implement unified/standard budget and accounting classification system that supports performance/program budgeting and tracking and reporting of climate change-related transactions (expenditure, revenue, assets and liabilities)	Joint leadership between MoF and LMs
Financial and fiscal reporting	Financial accounting standards and financial systems that provide the information necessary for reporting financial performance and ensuring financial accountability	MoF to establish a system that facilitates (monthly/ quarterly) reporting of financial position/performance and resource utilization in respect to climate change policies/ performance indicators and complies progressively with Financial Statement requirements of IPSAS and GFSM	Joint leadership between MoF and LMs

Source: Prepared by Peter Murphy (Expert Advisory Group)

Appendix 3. Where and how Ministries of Finance can collaborate and coordinate with key government and external stakeholders

Stakeholder	Key areas for engagement ('What?')	Role of Ministries of Finance ('How?')	Corresponding areas of Part B
Government stakeholders			
Heads of government	• Developing a strong national vision for the zero-carbon, climate-resilient economy. • Driving a whole of government (WOG) approach to climate action.	• Take a proactive role in high-level coordination with Head of State with key line ministries in developing and financing national climate plans. • Clarify MoF's mandate on climate change and make business case for MoF to play major role in driving sustainable economic development.	Function (F) 1, Capability (C) 1, C2
Line ministries	• Collaborating and coordinating with other ministries on climate action as part of a WOG approach. • Mainstreaming climate considerations into investment planning and budgeting. • Improving access to climate finance. • Leveraging expertise across government on climate action.	• Set up, lead or join inter-ministerial climate coordination mechanisms and clarify responsibilities, incl. through dedicated MoF focal points/ climate change units. • Involvement in developing strong climate, investment, sectoral and national development plans and strategies. • Use budget responsibilities to ensure that strategic and detailed line ministry budgets fully reflect government climate action strategies and identified investment needs, incl. through issuing guidance. • Drive sector transformations through greening sectoral budgets, carbon pricing measures, targeted fiscal incentives, and other relevant measures. • Conduct skill exchanges and training across agencies.	F1, F2, C2
Centrals banks and supervisor	• Aligning fiscal and monetary policy. • Greening central bank operations.	• Set out and update central banks' responsibilities and remits to bring them in line with government net zero and climate resilience commitments. • Encourage central banks to mainstream climate change into monetary policy and prudential supervision frameworks. • Encourage central banks to leverage reserves for climate action through zero carbon, climate-resilient investment strategies. • Encourage sovereign green and other thematic bond issuance. • Consider climate criteria in central bank senior appointments. • Consider ways to strengthen fiscal and monetary policy coordination related to climate action.	F3b
Sub-national actors (e.g. federal states, cities)	• Driving investment in the green economy in cities and regions.	• Strengthening sub-national financing instruments such as land-based financing, property taxes, PPPs, municipal green bonds. • Reviewing and reforming sub-national financing arrangements to unlock finance for investment.	F3a
State-owned enterprises, sovereign wealth funds, national development banks	• Driving SOE, SWF and NDB investments in a low-carbon, climate-resilient future.	• Revise mandates and introduce incentives to incorporate climate change priorities, incl. through board appointments, procurement and reporting requirements, and management incentives. • Consider value of creating green public investment banks to drive public and private investment. • Ensure SOEs are part of carbon pricing arrangements. • Consider using NDBs as the fiduciary agent for international climate finance.	F3b
Climate councils/ external audit bodies	• Building expertise, transparency and accountability of climate action.	• Consider assessments by these bodies when developing strategies and policies related to climate action. • Seek feedback from bodies on draft climate policy and budget proposals. • Consider reports on progress in implementation of climate targets and policies when determining policy gaps and adjusting actions. • Work with bodies to build internal expertise through collaborations and request specific analysis. • Ensure adequate funding.	C2, C3

Stakeholder	Key areas for engagement ('What?')	Role of Ministries of Finance ('How?')	Corresponding areas of Part B
Statistical agencies and meteorological offices	• Enhancing data provision on climate risk, emissions, and new technologies.	• Collaborate on research, modeling and tools. • Consider reviewing metrics of national prosperity and national accounting frameworks. • Consider setting up/strengthening tracking systems for surveillance of climate-related risks. • Ensure adequate funding.	C3
Debt management offices	• Increasing access to finance.	• Co-develop responsible debt management strategy related to financing national climate plans, incl. considering review of fiscal rules. • Co-develop frameworks for issuing green and other thematic bonds. • Consider relevance of debt-for-climate swaps.	F3a
External stakeholders			
Public and civil society organizations	• Ensuring a just transition, incl. public participation in and buy-in into climate policy.	• Clearly communicate proposed policies and actions. • Include citizens and relevant stakeholders in consultations (and design) for key policies (e.g. through participatory budgeting, public and stakeholder consultations, specific calls for input). • Ensure costs and benefits of climate change are distributed equally, incl. by providing targeted support for impacted individuals and communities.	F1, Just transition
International and regional networks	• Ensuring international cooperation. • Driving reform of global financial infrastructure/ enhancement of international norms. • Accessing expertise.	• Engage through Coalition of Finance Ministers and other networks to exchange experiences, share expertise and strengthen case internationally for stronger role of MoFs in tackling climate crisis. • Coordinate policy internationally. • Shape global financial architecture and international norms and priorities around climate action, incl. through G7, G20, G99 and other networks.	F3, C2
Private sector (business and finance)	• Driving private sector investment in zero-carbon, climate-resilient economy by leveraging diverse pools of capital. • Greening the financial system. • Building better information base for development of policies, incl. sectoral policies and regulations. • Creating buy-in from private sector into key climate policies.	• Provide strong predictable sense of direction through communication of clear climate priorities and plans. • Consult with private sector in course of policy development. • Enable private sector investment through establishing and co-creating platforms for de-risking, blended finance, and PPPs. • Co-develop sustainable finance roadmaps with key private sector investors and businesses, supported by multi-stakeholder platforms. • Co-develop frameworks with private sector to align businesses, portfolios and strategies with net zero, incl. disclosure requirements and taxonomies. • Work with relevant national financial centers to develop plans for green financial centers. • Work with insurance and other relevant sectors to develop risk finance and insurance strategies.	F3c, F3e, F1, F2
International finance institutions, multilateral development banks, development finance institutions	• Ensuring enhanced support for climate action.	• Use shareholder positions in IFIs/MDBs/DFIs to call for enhanced support for climate action. • Encourage increase in international climate finance, especially concessional finance and finance for adaptation. • Proactively engage in development of new global funding mechanisms and architecture for climate action. • Consider establishment of country platforms in strategic priority sectors in partnership with IFIs/MDBs/DFIs.	F3e
Academia, research institutes, think tanks, international organizations	• Leveraging skills and expertise. • Driving research and knowledge development.	• Attend and co-develop training courses and capacity-building programs. • Consider and engage with relevant analysis and expertise. • Set up expert committees, research partnerships or secondment schemes to leverage expertise.	C3

Appendix 4. Supplementary case studies

The powerful role played by Ministries of Finance in recent economic history—the UK and South Korea

The UK Treasury and South Korea's Ministry of Finance demonstrate the critical role that Ministries of Finance can play in crisis management and economic transformation, offering important lessons for climate action.

1. UK—Building new capacity in the Treasury to respond to the global financial crisis

The Treasury acted quickly and flexibly to build new capacity and overcome resource and expertise deficiencies in its response to the 2007–2009 global financial crisis.

The decade prior to the crisis was marked by relative financial stability and so in 2007 few Treasury staff had direct experience of managing a crisis and the department had only a small policy team working on financial stability. Thus, at the onset of the crisis, the Treasury was under-resourced to deal with the scale and nature of the workload. It responded by:

- **Increasing staffing levels** from around 20 people working on the collapse of Northern Rock [the British bank that became an early victim of the crisis] to around 120 officials working directly on financial stability in the summer of 2009, by redeploying certain Treasury staff and recruiting new staff. This gave rise to the need for a formal induction program.
- **Creating 'crack teams'** by setting up a resolution team for the Northern Rock crisis, initially consisting of seven officials but quickly growing to 24. After Northern Rock was nationalized, the resolution team was reduced in size.
- **Drawing on in-house expertise** already dispersed throughout the Treasury, e.g. the Debt Reserves Management (DRM) team on capital markets and central bank balance sheets.
- **Taking advice from external experts** when in-house expertise was insufficient.
- **Building new knowledge and skills:** Most of the staff deployed to work on the crisis were 'generalists' and they had to learn on the job, assimilating new knowledge and experience throughout the crisis. New training schemes were developed to support skill development.
- **New arm's-length agencies** were set up to manage the delivery side of the crisis, e.g. the Asset Protection Agency. With more flexibility in recruitment than the Treasury had, these bodies were more easily able to attract people with relevant expertise (HM Treasury, 2012).

Lessons from the UK's experience for today's Ministries of Finance include:

- Some Ministries of Finance, especially those in higher capacity contexts, are able to act with flexibility and speed in a crisis, provided it is made a political priority.
- Tackling climate change will require Ministries of Finance to develop and utilize new knowledge, skills and capabilities. Ministries could consider setting up crack units that can leverage new expertise internally and externally.
- Ministries of Finance will need to embed new climate change skills in their operations and training, developing programs to fill gaps in in-house skills and capabilities.
- New agencies may be better equipped to manage certain types of tasks or be better able to attract staff with different skills. Ministries of Finance should consider delegating responsibilities to new and existing agencies that are better placed to handle the particular requirements of some actions on climate change.

2. South Korea—The role of planning for economic transformation

The Ministry of Finance and Economic Planning board (now part of the Ministry of Finance) played an active role in driving South Korea's industrialization under President Park.

Under the rule of Park Chung Hee (1961–1979), South Korea experienced rapid economic growth and industrialization, transforming it from one of the poorest countries in the world to a modern industrial power in under three decades, a feat that took other industrialized nations almost a century to achieve. Park's government played an active role in controlling the process of economic development from the start (Kim, 2017).

- **The creation of the Economic Planning Board (EPB),** now part of the Ministry of Finance, was one of Park's first acts in government (IIE, 2003). The EPB was responsible for inter-ministerial policy coordination and developing the five-year country development plans. Its jurisdiction included both current and capital budgeting as well as external funding, enabling the EPB to link policy coordination and planning to economy-wide resource allocation. South Korea's development strategy was focused on export-led industrialization (Kim, 2019), so the government directed policy measures heavily toward sectors with high export potential.
- **The EPB formed coalitions with other sectoral ministries** to encourage export-led growth. It controlled the government's budget and so had power to influence the other economy-related ministries, the Ministry of Finance and Ministry of Trade and Industry. These three ministries formed the core of the South Korean developmental state. The EPB relied on the Ministry of Finance to be the mobilizer of domestic capital, which it did through its management of the banking system (Kim, 1991).
- **Flexibility and adaptability** were maintained throughout the process of structural transformation. A dynamic approach was taken to the targeting of sectors over time. Further, the setting of incentives for the private sector allowed private entrepreneurs flexibility in navigating toward the outcomes the government desired. This enabled the country to respond to changing global markets and its relative factor endowments.
- **The financial system was a major instrument** used by the government to implement its export-led industrialization strategy during this period (Lechevalier et al., 2016). The most powerful tool was public-sector-initiated allocation of credit to prioritized sectors through 'policy loans' with low interest rates and favorable repayment terms, granted by development banks to exporting firms (Kim, 1991).
- **The Ministry of Finance sat at the top of the hierarchically organized financial system,** supervising and regulating the activities of other actors, including banks and the Bank of Korea (Lechevalier et al., 2016). It exercised tight control on all aspects of their activities up to the early 1990s.

Lessons from South Korea's experience for today's Ministries of Finance include:

- Ministries of Finance can benefit from taking an active role in directing and supervising other actors to drive rapid change in targeted sectors.
- Ministries of Finance have a central position in government and need to take a whole-of-government approach to ensure that action on climate is integrated across the entire economy.
- Public finance institutions, such as development banks, can play an important role in raising, blending and steering public and private investment. Ministries of Finance will need to consider greater use of existing national development banks or the creation of new financial institutions and tools, such as green investment banks, to drive action on climate change.
- A long-term strategy can help to guide the actions of different players toward a common goal. Ministries of Finance can apply this lesson in the context of climate change and recognize the importance of aligning fiscal policies with strategies for decarbonization and development.

Source: Prepared by Charlotte Taylor (formerly Grantham Research Institute, LSE), with input from Youngsun Koh (Ministry of Finance, Korea)

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Appendix 6. List of abbreviations

ADB – Asian Development Bank

AfDB – African Development Bank

BFP – Budget Framework Paper

BMZ – German Ministry for Economic Cooperation and Development [Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung]

BNDES – Brazilian Development Bank

BoE – Bank of England

CABRI – Collaborative Africa Budget Reform Initiative

CBA – cost–benefit analysis

CBAM – carbon border adjustment mechanism

CCDR – Country Climate and Development Report

CCF – Contingent Credit Facility for Natural Disaster Emergencies

CCRIF – Caribbean Catastrophe Risk Insurance Facility

CCUS – carbon capture, usage and storage

CEE – Central and Eastern Europe

CFA – Central Finance Agency

CFU – Climate Finance Unit

CGE – computable general equilibrium [model]

CiCLIA – Cities and Climate Change in Africa

CO_2 – carbon dioxide

COP27 – 27th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change

DAC – Development Assistance Committee [of the OECD]

DFI – development finance institution

DGE – dynamic general equilibrium

DMO – debt management office

DRF – disaster risk financing

EBRD – European Bank for Reconstruction and Development

EC – European Commission

ECB – European Central Bank

EEIST – Economics of Energy Innovation Systems Transition

EFSD – European Fund for Sustainable Development

EIB – European Investment Bank

EIP – External Investment Plan [EU]

EMDCs – emerging markets and developing countries

ESRI – Economic Social Research Institute

ETF – Enhanced Transparency Framework

ETS – emissions trading scheme/system

EU – European Union

EV – electric vehicle

EWS – early warning system

FC4S – Financial Centres for Sustainability

FSB – Financial Stability Board

FSOC – Financial Stability Oversight Council

G20 – Group of Twenty

GBSC – Green Bond Steering Committee

GCF – Green Climate Fund

GDP – gross domestic product

GEF – Global Environment Facility

GFPN – Green Fiscal Policy Network

GIB – Green Investment Bank

GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit [German Development Agency]

$GtCO_2e$ – gigatonnes of carbon dioxide equivalent

HLAG – High-Level Advisory Group

HLEG – High-Level Expert Group

HP – Helsinki Principle

I4CE – Institute for Climate Economics

IAM – integrated assessment model

IDB – Inter-American Development Bank

IFC – International Finance Corporation

IFI – international finance institution

IFRC – International Financial Reporting Standards

IIED – International Institute for Environment and Development

IMF – International Monetary Fund

IPCC – Intergovernmental Panel on Climate Change

IPSASB – International Public Sector Accounting Standards Board

IRA – Inflation Reduction Act [United States]

ISSB – International Sustainability Standards Board

KfW – German state-own investment and development bank

KPI – key performance indicator

LDCF – Least Developed Countries Fund

LM – line ministry

LTS – Long-Term Strategy

LVC – land value capture

M&E – monitoring and evaluation

MBUF – mileage based user fees

MDAs – Ministries, Departments and Agencies

MDB – multilateral development bank

MoF – Ministry of Finance

MRV – monitoring, reporting and verification

MTBF – medium-term budget framework

MTFF – medium-term fiscal framework

MW – megawatt

NAP – National Adaptation Plan

NDB – national development bank

NDC – Nationally Determined Contribution

NZECA – Net Zero Export Credit Alliance

NZSF – New Zealand Superannuation Fund

O&M – operation and maintenance

ODA – overseas development assistance

OECD – Organisation for Economic Co-operation and Development

PAGE – Partnership for Action on Green Economy

PDF – Project Development Funds

PEFA – Public Expenditure and Financial Accountability

PFM – public financial management

PIM – public investment management

PIMA – Public Investment Management Assessment

PPA – power purchase agreement

PPF – project preparation facilities

PPP – public–private partnership

R&D – research and development

RD&D – research, development and demonstration

REDD+ – reducing emissions from deforestation and forest degradation

RST – Resilience and Sustainability Trust

RUC – road user charging

SBA – Sustainable Budgeting Approach

SBTi – Science-Based Targets Initiative

SCCF – Special Climate Change Fund

SDGs – Sustainable Development Goals

SMEs – small and medium-sized enterprises

SOE – state-owned enterprise

SWF – sovereign wealth fund

SWG – sectoral working group

TCFD – Taskforce on Climate-related Financial Disclosures

tCO_2 – tonne of carbon dioxide

TFCR – Taskforce on Climate-related Financial Risks

TNFD – Taskforce on Nature-related Financial Disclosures

UNDP – United Nations Development Programme

UNEP – United Nations Environment Programme

UNEP FI – UN Environment Programme Finance Initiative

UNFCCC – United Nations Framework Convention on Climate Change

UoP – use of proceeds

VAT – value-added tax

VCM – voluntary carbon market

WEF – World Economic Forum

WOG – whole-of-government [approach]

The Coalition
of Finance Ministers
for Climate Action

www.financeministersforclimate.org