Strengthening the Role of Ministries of Finance in Driving Climate Action

A Framework and Guide for Ministers and Ministries of Finance

Full Report: Consultation Draft

The Coalition of Finance Ministers for Climate Action is initiating an open consultation with stakeholders on how to strengthen the role of Ministries of Finance in driving climate action. The objective is to set out guidance in the form of a 'Ministry of Finance Framework for Climate Action', of which this is a draft. The framework will be launched in early 2023 and presented to Finance Ministers in April 2023.

At this stage, we especially welcome the advice of reviewers in the following five areas:

1. What role should Ministries of Finance play in driving climate action? Are their mandates and roles sufficiently well defined?
2. What steps in the 15 action areas and beyond outlined in Part C of this report are the most critical to achieving progress? Are there any missing?
3. How do you view the usefulness of the proposed framework? What additional evidence should be considered?
4. What organizational reforms are the most important for strengthening the capability of Ministries of Finance to act on climate? How should Ministries prioritize their efforts?
5. What are the key challenges that hold back progress by Ministries of Finance? How can these be overcome?
6. What key actions can the Coalition of Finance Ministers for Climate Action take to most effectively support its members to deliver on the agenda proposed in this guide?

Note: The final version of this guide will contain several additional features, including;

- *An implementation guide outlining specific actions Ministries of Finance can take to implement the agenda presented in this report.*
- *Further reading and key resources for each area, as well as a list of areas where further research is needed.*
- *Further reading for all case studies referenced.*
- *More explicit links to the climate-nature nexus throughout the report.*

It will also be professionally designed - including a visualization that will help readers navigate the framework throughout the report.

Authors and Acknowledgements

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Foreword

The need for a guide to mainstreaming climate action emerged as a key priority within the Coalition of Finance Ministers for Climate Action in 2022. In February 2022, the Helsinki Principle 2 workstream published the report Strategies for Mainstreaming Climate Action in Ministries of Finance: Governance, Capacities, and Research Practices. In assessing the current capacity of Ministries of Finance to address climate change and mainstream climate action, it found that many lack capacity and expertise to drive climate action at the speed and scale required—but also there is wide recognition that Finance Ministers and Ministries hold critical policy tools for driving climate action through economic, fiscal and financial policies. To better understand, recognize, empower and operationalize their role within the national and global context, a gap must be filled and in November 2022 Ministers agreed to launch a global public consultation on the role of Ministries of Finance in driving climate action.

The leadership of national climate policies typically sits with other ministries—such as Ministries of Environment—and requires significant engagement and action across all parts of government. Therefore, Ministries of Finance need to engage in dialogue and partnership with other ministries, decision-makers, and stakeholders more broadly on climate. An enhanced leadership role, by Ministries of Finance, as recommended in the guide, can only be undertaken with a clear articulation of their core tasks and responsibilities at the national level, and by introducing this role into national climate governance frameworks.

This 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. The guide is not supposed to be prescriptive: rather, it aims to provide a comprehensive 'menu of options' to help member countries to mainstream climate action into economic, fiscal, and financial policy through enhancing their core functions and capabilities according to their specific national circumstances.

Although there is 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. Their priorities for action will depend on their own circumstances and challenges. The Coalition will work towards supporting its members in this work in various ways, together with its institutional partners.

This work has been the effort of a wide range of stakeholders and collaborators, and has drawn on contributions from over 30 different institutions and individuals. The Coalition is especially grateful for the advice of Professor 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 of the guide, supported by a senior advisory group of leading experts and by consultations and contributions from 15 Coalition member countries to gather inputs for and strengthen the report. Finland and Rwanda have led the work on behalf of the Coalition, as country-leads of the Helsinki Principle 2 workstream.

We would now welcome and value your views on this draft version of the guide for consultation, before moving to finalisation in Spring 2023.

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Introduction

This report 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. Its principal audience is intended to be Ministries of Finance, but it is designed to be useful to anyone seeking to better understand the role of Ministries of Finance in driving climate action.

The urgency and scale of climate action

The urgency and scale of action required to tackle the climate crisis cannot be overstated. Under the Paris Agreement, the world has agreed to keep global temperatures within 1.5 degrees Celsius of the pre-industrial average, requiring the world to reach net zero greenhouse gas emissions by 2050. Beyond this threshold small changes in temperatures can lead to dramatic shifts in Earth's entire life support system, with significant implications for economies and people. To keep the world on a pathway to net zero by mid-century, we need to make a 45% reduction in global greenhouse gas emissions by the end of this decade from 2010 levels. Yet we are currently on track to see a 14% increase (IPCC, 2022). Urgent action is therefore required to rapidly lower emissions. At the same time, the speed of climate change is accelerating, and its impacts are more serious than anticipated (ibid.). Nature loss too, inextricably linked with climate change, is declining at unprecedented rates (IPCC, 2021) . This calls for great urgency on adaptation and resilience, including the restoration and protection of biodiversity and natural capital, as well as addressing loss and damage.

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, buildings, transportation, industry and agriculture (NCE, 2018). It will require reimagining the coping mechanisms to adapt to the fast-changing climate and to look at new ways to significantly boost resilience. These changes will demand a massive 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 will be needed globally by 2030 to meet the goals of the Paris Agreement (Stern, Bhattacharya, et al., 2021). Investment and spending, including on loss and damage and the just transition in emerging markets and developing countries (other than China) alone will need US$2.4 trillion by 2030, half of which will need to come from external sources (Songwe et al., 2022).

The role of Ministries of Finance in driving climate action

Ministries of Finance hold significant levers for accelerating climate action. The scale of transformation required demands coordinated action across government that goes beyond the remit of sectoral ministries. As center-of-government bodies at the crux of coordinating economic, fiscal and financial policymaking, responsible for managing well over US$20 trillion in public spending globally,[1] Ministries of Finance and their Ministers are uniquely placed to help secure the sustainable, inclusive and resilient future we need. They must therefore be at the heart of promoting, coordinating, and financing government-wide climate action. By taking climate action seriously, Ministries of Finance will be better able to tackle the current series of interlinked crises they face and achieve their core objectives of macro stability, growth and the responsible management of public finances.

Ministries of Finance are not yet fully utilizing their powers to drive climate action. Strengthening their role in climate-related policymaking will require substantial changes to governance and in-house functions. This will require Ministries of Finance to take further steps to mainstream climate action

[1] Government expenditure typically under the purview of Finance Ministries is ~30% of global GDP on average, totalling over $85 trillion (see Zouhar et al. (2021) and IMF WEO Database for further details).

into their organizational strategies and core policy areas, including through reforming macroeconomic strategy, reforming fiscal policy through budget and tax, and reforming financing and the financial system. To do this, Ministries of Finance will need to strengthen their mandates and build the necessary leadership, coordination, staffing, skills and analytical capabilities through far-sighted organizational reforms. Table I1 summarises the key entry points for mainstreaming climate action into the core functions and capabilities of Finance Ministries (which are built on in Tables A1 and A3 of this report).

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 have recognized that they and their ministries hold important levers for accelerating climate action.[2] 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.

Table I1. Mainstreaming climate action in Ministry of Finance functions and capabilities (Summary)

Thematic area	Core Ministry of Finance functions	Opportunities for mainstreaming climate action
Macroeconomic 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 • Greening national development and sector strategies • Shaping innovation and industrial strategies • Developing investment strategies including by assessing investment needs for the transition
Fiscal policy and budget management [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 • Public investment strategy and policies* • Policies on public procurement • Accounting policies and guidelines • Implementing global standards for tracking revenues and expenditures	• Mainstreaming climate action within MTEFs 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 • Regulation of financial institutions	• Domestic resource mobilization including frameworks for debt financing, green bonds, and sub-national finance for climate action • Greening publicly backed financial institutions and central banks • Catalyzing private capital through greening the financing sector, innovations in financing models and sustainable finance roadmaps • Disaster risk finance and insurance

[2] https://www.financeministersforclimate.org/

	• Management and regulation of other government assets and liabilities • Managing shareholdings and relationships with IFIs, MDBs, IOs	• Leveraging international climate finance
	Core Ministry of Finance capabilities	**Opportunities for mainstreaming climate action**
Leadership and governance [Capability 1]	• Ministry mandate, strategy, and senior leadership	• Strengthening champions at senior and official level to drive climate mainstreaming • Strengthening mandate reflecting MoF 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
Collaboration [Capability 2]	• Processes for coordination and collaboration with other government departments and actors	• Processes for driving effective collaboration on climate action with other public agencies, private sector, civil society, MDBs, global financial architecture, other actors • Effective communication strategies for consultation and communication around climate policies
Human and analytical [Capability 3]	• Staffing structure and skills • 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 (including macroeconomic indicators and forecasting) • Alternative metrics of national prosperity

Purpose of this guide

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 that they face. It provides a framework and guide that Ministries can use to inform their own assessment of how to mainstream climate action into their own operations. It focuses on how Ministries of Finance can enhance their core functions and capabilities to drive climate action at the pace and scale required, while providing a realistic pathways and priorities to implement key changes.

The guide lays out both a strategic and practical agenda for action. 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 overcome the barriers to action that they face to 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 that 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.[3] This report aims to make a contribution towards closing this gap. It should be seen as a starting point, which will be refined following feedback.

[3] Notable exceptions to the so far limited literature are: Delgado et al. (2021) and Orozco and Jaramillo (2021)

The guide is designed to:

- Connect and leverage the existing workstream products of the Coalition of Finance Ministers for Climate Action **across all six Helsinki principles** and offer guidance on how Ministries of Finance can implement them (see next page).
- Shift the climate change discourse away from a focus on costs and risks towards an equal emphasis on the **net benefits and opportunities** of action.
- **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's Co-Chairs and Secretariat to build the **capability and capacity** of Coalition members under Helsinki Principle 2.

This guide ***is not*** a comprehensive deep dive into each topic, but it signposts more detailed reports, guides, and literature on each topic.

How to use this guide

The guide is divided into three parts:

- **Part A** explains why Ministries of Finance need to take climate action seriously, and how their climate leadership can help them deliver on their core priorities.
- **Part B** sets out a practical framework for Ministries of Finance to galvanize action and drive in the shift towards a zero carbon, climate-resilient future. Ministries can use the framework to help build their core functions and capabilities to act on climate.
- **Part C** presents an overall agenda for action for Ministries of Finance and suggests ways in which they can craft strategies tailored to their specific circumstances and local context.

The report is complemented by the following additional products:

- A high-level summary for Ministers
- A synthesis report for policymakers
- Several Annexes containing:
  - Table D1. The central role of Ministries of Finance in driving climate action vis-à-vis other actors across the economy and in key sectors
  - Table D2. Key entry points for mainstreaming climate action in budget formulation
  - Resource for Ministries of Finance *[to be added]*

About the Coalition of Finance Ministers for Climate Action

The Coalition of Finance Ministers for Climate Action brings together fiscal and economic policymakers from 81 countries in leading the global climate response and in securing a just transition towards 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 towards 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.

Methodology

This guide and framework are 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). The capabilities draw on a range of work including World Bank (2013) and (ODI (2016). Pioneering work by Orozco and Jaramillo (2021) and Delgado et al. (2021) as well as existing reports produced by the Coalition of Finance Ministers, provided additional inspiration.

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 for a list of members). The report has also benefited from semi-structured interviews with officials in 15 Ministries of Finance, namely:

- Bahamas (Ministry of Finance)
- Chile (Ministry of Finance)
- Denmark (Ministry of Finance)
- Finland (Ministry of Finance)
- Indonesia (Ministry of Finance)
- Ireland (Department of Finance)
- Jamaica (Ministry of Finance and Public Service)
- Malaysia (Ministry of Finance)
- Rwanda (Ministry of Finance and Economic Planning)
- Spain (Ministry of Economic Affairs and Digital Transformation)[4]
- Korea (Ministry of Economy and Finance)
- Uganda (Ministry of Finance, Planning and Economic Development)
- United Kingdom (HM 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.

'Ministries of Finance': A note on terminology

Throughout this report, the term 'Ministry of Finance' is used to broadly refer to those government departments 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., economic affairs or planning, and reflecting their portfolio they may be called 'Ministries of Finance and Planning' or 'Ministries of Economy'. In other countries the responsibilities referred to in this report may be split across more than one Ministry. Many countries have also established (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).

[4] 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

An opportunity to tackle multiple crises and drive economic prosperity

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 net zero greenhouse gas emissions by 2050, yet emissions keep rising. Getting the world on track to avoiding catastrophic climate change requires "wide-ranging, large-scale, rapid and systemic transformation" (UNEP, 2022b). This kind of decisive climate action can be the development and growth story of the 21st century (Stern, Bhattacharya, et al., 2021). It will not happen without significant leadership from Ministries of Finance.

At the same time, around the world national governments are struggling with a series of interlinked crises. On top of climate change, the world is facing a biodiversity crisis, an economic crisis in the form of slow growth, 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.

As described in the Introduction, by taking strong action on climate Ministries of Finance will be better able to 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. A rapid switch to renewable energy presents an opportunity for countries to deliver cheap, secure and clean energy and fight inflation.
2. Acting on climate will help Ministries of Finance to avoid escalating risks with macro-critical consequences.
3. Climate action can unlock significant growth and development benefits, while generating a variety of cost savings that alleviate pressure on public budgets.
4. Investing in resilience to the growing incidence of climate hazards can unlock a 'triple dividend': for the economy, society and environment.

These benefits are outlined in further detail below.

Benefit 1: Delivering cheap, secure and clean energy while moderating inflation

The current macroeconomic environment and inflationary pressures underscore the importance of countries investing in a renewable energy 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. While many countries are facing growing pressures for fiscal consolidation, the case for investing in climate action and renewable energy is stronger than ever before. New sources of renewable energy are now at cost parity or cheaper than many fossil fuel energy sources, as witnessed in the sharp reductions in the costs of wind and solar energy over the last decade (IRENA, 2021). Green energy investment can create new direct employment opportunities quickly, as renewables can be installed practically everywhere, rapidly and simultaneously (ILO, 2018). Moreover, if global inflationary pressures prove more persistent and the collective policy response more contractionary than expected, the case for supporting the renewable energy transition only becomes stronger. Expanding investment in renewables, electrification, and energy-efficiency will 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. Oil supply shocks have been a frequent occurrence 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). 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). 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 are likely to remain promising despite the challenges of often higher up-front financing needs (Llewellyn, 2022).

Investing in renewable energy infrastructure is not just about short-term recovery and inflation reduction—it is likely to generate substantial savings for national economies and enhance resilience to future shocks in the long run. 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 US$12 trillion by 2050, without accounting for climate damages or the co-benefits of climate action (Way et al., 2022). Meanwhile, countries such as **Uruguay** and **Finland** have already successfully diversified their energy sources away from fossil fuels. For now, these countries are proving to be better insulated from global energy prices changes and are experiencing lower rates of inflation than their neighbors (see Box A1).

Some governments are already addressing the cost-of-living crisis through expansion of renewables and sustainable transport modes with targeted support to citizens at the same time. For instance, **Lithuania** is combining a price cap on gas and electricity prices with a major investment of €1.12 billion to encourage greater energy security through renewable energy sources and green renovation production capacity. The **US** Inflation Reduction Bill, the most significant climate legislation in the US to date, explicitly recognizes the potential for climate action to help tackle inflation. It includes US$369 billion of funding for renewable energy and climate action over the next decade. It is hoped that the increased production of a range of goods, from solar panels to electric vehicles, will increase supply relative to demand and bring down prices in the medium run (The White House, 2022). Other examples of countries that are addressing the cost-of-living crisis while driving climate action are provided in Box A1.

Box A1. Examples of Finance Ministers addressing the cost-of-living crisis and tackling inflation through investing in renewable energy and climate action

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

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

- **Lithuania** is planning to present a support package for the soaring energy prices in the country, which could be the largest package of its kind in the EU. The plan is to invest €1.12 billion in energy independence, including renewable energy sources and green renovation production capacity. Grants will be given to modernize buildings and to 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** has introduced new measures to boost its renewable sector with the Emergency Renewable Energy Package. The measures make it easier for wind and solar farms to sell their electricity directly on the market for 18 months without going through the existing process of Contracts for Difference (CfDs). Additionally, France has doubled the size of the Oléron offshore wind zone with the aim to build 40 GW of offshore wind by 2050 (WindEurope, 2022).

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

- **Spain** provided free rail tickets for short and medium-distance journeys throughout the fall of 2022 to help citizens deal with rising inflation. The scheme has been recently extended until the end of 2023 when its effects on the economy and environment will be assessed (Euronews, 2022b).
- Over the summer of 2022, **German** citizens had access to all regional public transport in Germany for a single ticket of only €9 per month. The major price reduction created financial incentives 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 an extension to subsidized public transportation and to introduce a new monthly 'climate ticket' priced at €49 as part of the inflation-relief package (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 recently managed to contain its inflation at a relatively low rate (3.5%) compared with the EU average of 10%. 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 renewable sources or low-carbon emission technologies and electricity prices were not 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% (European Commission, 2022).
- In **Uruguay**, the Ministry of Finance has supported the transformation of its energy system to nearly 90% renewable energy production – the highest rate in Latin America. Uruguay is now seeing lower inflation rates than in all other Latin American countries: The median increase in the annual inflation rate was 5% for the main economies of Latin America (as of September 2022, compared to 2021), compared to 1.5% in Uruguay (MoF Uruguay, 2022).

Source: Prepared by Oleksandra Plyska (Grantham Research Institute)

Benefit 2: Avoiding escalating risks that could have macro-critical consequences

Without action on climate, Ministries of Finance are likely to face a range of escalating risks that could produce macro-critical consequences. They will have to deal with more frequent and intense shocks as the physical impacts of climate change and global decarbonization adversely affect asset values, economic activity, and jobs. This will negatively affect 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. Especially prominent risks include:

- **Cascading economic shocks**: 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). Even this is likely to be a significant underestimate, given the tipping points in the climatic system that are likely approaching. Moreover, the drivers of climate change are rapidly depleting nature and biodiversity, undermining the natural capital upon which our economy is based (see Box A2).
- **Budgetary shocks:** The failure to assess and mitigate climate-related risks will lead to higher public expenditures for reconstruction of infrastructure, disaster relief, and write-downs of stranded assets, coupled with adverse impacts on the tax base. Already, natural disasters are causing direct

damage to power generation and transport infrastructure, costing about $18 billion a year in low- and middle-income countries alone, which is expected to rise with climate change (Hallegatte et al., 2019). 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 will rise to 41%, 52% and 37% respectively in a 2° C warming scenario (Marsh Mclennan, 2022). According to insurance broker Aon (2021), natural hazard-related catastrophes caused USD 2.98 trillion of damage between 2010 and 2019, 50% higher than the previous decade.

- **Increased cost of capital:** The changing climate has a material impact on sovereign risk and the cost of capital 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). A growing range of tools are being developed such as ASCOR (Assessing Sovereign Climate-related Opportunities and Risks) that are making it easier for investors to track government emissions reduction targets, climate-related policies, legislation, carbon pricing, sectoral policies and adaptation planning and preparedness (PRI, 2022).
- **Reduced competitiveness and market opportunities**: In a world where most countries ramp up climate action, late movers will risk reduced growth, productivity and competitiveness (Systemiq, 2020). Changing consumer preferences and the introduction of border carbon adjustment mechanisms could also negatively impact exports in traditional economic sectors (UNCTAD, 2021).
- **Increased risk of climate litigation:** Climate litigation is now recognized by the IPPC as a factor that can have a significant impact on the 'outcomes and ambition' of climate governance (IPCC, 2022). With over 2,000 documented cases of climate change litigation around the world, litigation presents a growing risk for 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).
- **Human suffering and social discontent:** Groups negatively affected by climate impacts and a disorderly transition face increased vulnerability and poverty. While adaptation is essential, limits to adaptation are already being reached in some locations. Climate change is already pushing upwards of 26 million people temporarily or permanently under the international extreme poverty line every year (Hallegatte et al., 2017). This number is expected to rise to 130 million by 2010 without adequate action on climate (Jafino et al., 2020). 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 action by Ministries of Finance, it is unlikely that countries will meet their domestic and international policy commitments, creating tensions with other key line ministries and global partners.

Benefit 3: Unlocking major growth and development benefits while generating cost savings that alleviate pressure on public budgets

Taking strong action on climate change can help countries meet their core economic and social objectives by driving growth and development. The costs and risks from climate policies are not only manageable but are significantly outweighed by their benefits (IMF, 2022a). Indeed, 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. As above, investing in the transition is becoming easier and cheaper by the day. Within the last 10 years, the cost of large-scale solar projects has fallen by 85% and onshore

wind by 56% (IRENA, 2021). Solar and wind power are now the cheapest forms of new energy generation in countries covering over 70% of global GDP (BloombergNEF, 2021).

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

- **Spurring innovation and discovery:** Innovation is the key to sustainable growth. The net zero transition is 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. Frontrunning countries will be the best positioned to benefit. Ministries of Finance can play a key role in providing funding and incentives for climate-friendly innovation (see Box B1 on innovation).
- **Maximizing job opportunities:** Estimates suggest that a transition to net zero can create up to 65 million new low-carbon jobs by 2030—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 some locations. For instance, Reyes et al. (2021, in Eguino and Delgado, forthcoming) find that NDC implementation in Latin America and the Caribbean could create 15 million jobs. In the near term, too, climate-friendly 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). 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).
- **Promoting a wide range of social, health and environmental co-benefits**: Climate action offers an opportunity to capture a wide range of environmental, social, gender-related, and health benefits. For instance, investments to reduce short-lived climate pollutants such as black carbon arising from incomplete combustion could result in 0.7–4.7 million avoided premature deaths annually (Shindell et al., 2012). Such actions can also significantly reduce pressure on health services. In China, implementation of air pollution prevention and control measures during the 13th Five-Year Plan period (2016–2020) prevented 380,000 premature deaths and resulted in estimated health-related economic benefits of CNY 2.49 trillion, far outweighing the policy costs of CNY 1.78 trillion (CAEP and EFC, 2022). Addressing nature loss is critical for a successful transition to net zero, and investing in the green economy can protect the natural capital on which our economies depend (see Box A2). And given that climate change disproportionately impacts women and girls, climate action can create new opportunities to bring women into the workforce and to protect their livelihoods. BCG (2021) estimates that closing the gender gap in the green economy could increase global GDP by 1.7% annually.
- **Improved fiscal sustainability:** The tax bases of many countries are already shifting due to higher vehicle energy efficiency, electrification, and shifts towards 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 by identifying new sources of revenue for investment in the new economy and to ensure an orderly transition to net zero. In the medium term, climate policy can lead to new sources of tax revenue as fast-growing clean sectors become consolidated as major new pillars of the economy. And, as discussed above, investing in renewable energy and reducing expensive fossil fuel imports could bring substantial benefits to public budgets. New renewable projects added in 2020 are estimated to result in lifetime savings for emerging economies of up to US$156 billion, compared with business-as-usual (IRENA, 2021).

A2. Climate action is essential 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). The recent Helsinki Principle 5 Coalition report (Coalition of Finance Ministers for Climate Action, 2022a) 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. The 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 tradeoffs between nature and climate action, which 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 strategically manage them.

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 through 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, 2022)

Benefit 4: Investing in resilience can unlock a 'triple resilience dividend': for the economy, society and environment

The economic impacts of climate change are already evident for many countries in the form of extreme temperatures, rising and acidifying oceans, and increasingly frequent and more extreme weather events like wildfires, droughts, hurricanes and floods. As above, these impacts put lives and livelihoods at risk and the impacts carry an ever-higher price tag. A recent study (AON, 2021)estimated natural hazard-related catastrophes caused nearly US$3 trillion of damage from 2010 to 2019, 50% higher than the previous decade. However, investing in adaptation and resilience can generate a so-called triple resilience dividend (Global Commission on Adaptation, 2019; Heubaum et al., 2022; Roezer et al., 2021), of avoided losses, economic benefits, and social and environmental benefits – see Figure A1.

The Global Commission on Adaptation (2019) estimates that investments of US$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 US$8.9 trillion, a benefit-cost ratio of 4.8 to 1, and a net present value (NPV) of US$7.1 trillion. The second and third dividends are especially important since they accrue regardless of whether the actual climate risk materializes. Initial analysis suggests that combined, the second and third dividend 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, further highlighting the value of adaptation investments (Heubaum et al., 2022).

Figure A1. Summary of potential benefits from investing in adaptation and resilience

	Dividend 1: Avoided Losses • Early warning systems (EWS) save lives and assets worth at least 10 times their cost. Just 24 hours warning of a coming storm or heat wave can cut the ensuing damage by 30 percent. Spending US$800 million on EWS in developing countries would avoid losses of US$3 billion to US$16 billion. • Infrastructure that is more climate-resilient can add around 3 percent to the upfront costs yet provides benefit-cost ratios of around 4:1. With US$60 trillion in projected infrastructure investment between 2020 and 2030, the potential benefits from early adaptation are enormous.
+	**Dividend 2: Economic Benefits** • Reducing flood risks in urban areas lowers financial costs, increases security, and makes high-climate risk investments more viable. London invested in Thames River flood protection, making investments in Canary Wharf and other East London developments viable. • Drip irrigation technologies developed for water scarcity are now used widely because they lead to higher crop productivity than traditional irrigation systems.
+	**Dividend 3: Social and Environmental Benefits** • Mangrove forests provide over US$80 billion per year in avoided losses from coastal flooding and protect over 18 million people. They contribute US$40 billion to US$50 billion yearly in nonmarket 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: Heubaum et al. (2022), from Global Commission on Adaptation (2019).

Unlocking the development and growth story of the 21st century

The combination of these benefits and opportunities and avoided costs and risks mean that climate action can be the 'development and growth story of the 21st century' (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. On the one hand, failure to address climate change will create an unstable and hostile world, which will make the ability of countries to achieve their development goals very difficult at best, and impossible at worst. One study, for example, suggests that without strong climate action the loss and damage from climate change in developing countries could reach US$290–580 billion in 2030 and US$1.1–1.8 trillion in 2050 (Markandya Anil and González-Eguino, 2019). This would force these countries to divert resources away from economic development and poverty reduction to address these costs. At the same time, climate measures that damage livelihoods, including those of the poorest and most vulnerable, could face strong opposition and would likely fail.

On the other hand, climate action can provide considerable development benefits and help in the fight against poverty (Lankes et al., 2022). And poverty reduction itself reduces climate vulnerability. Under an improved development scenario that assumes rapid and inclusive growth with universal access to basic services, the impacts of climate change on poverty would be significantly reduced, from an additional 132 million to 68 million people in poverty in 2030, according to one recent study (Jafino et al., 2020).

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

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

Capturing these significant economic and wider benefits will require far-sighted leadership by national decision-makers, including Ministers of Finance. 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 the transition. Not every Ministry of Finance is the same. There are important differences across countries between the mandates, organizational structures and cultures of Ministries of Finance that may impact on their role in driving climate action or supporting the role of other government ministries and agencies (Allen et al., 2015, 2016; see also Part C). Yet they typically have a shared set of priorities, which, as discussed above, climate action can help them achieve. And they 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. These functions and capabilities and how they can be enhanced are the subject of 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 net zero.
- They usually have direct control over **macro-fiscal policy and regulatory functions,** including taxation, budget and debt management, enabling them to oversee the policy reforms needed for 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 US$20 trillion,[5] and a crucial role in collaborating with line ministries to 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, and often play key roles in regulating the financial sector and can help shift these institutions onto a green trajectory.
- They are owners of a range of powerful **tools and approaches,** from macroeconomic forecasting and modeling to economic impact assessments and provision of guidance on investment appraisals that shape the spending decisions of other government departments.

A successful transition to net zero will therefore only be possible with the active involvement and leadership of Ministries of Finance working hand in hand with other actors, including the public and private sectors, non-governmental organizations (NGOs) and academia.

Ministries of Finance have both the incentive to act to drive climate action to achieve their core objectives, and the experience to do so: in the past they have responded to other major economic

[5] Government expenditure typically under the purview of Finance Ministries is ~30% of global GDP on average, totalling over $85 trillion (see Zouhar et al. (2021)and IMF WEO Database for further details).

challenges where they have similarly taken a lead role in tackling immense risk and driving transformation. In the decades following World War II, Ministries of Finance, often together with planning ministries and public financial institutions, played a proactive coordinating role in industrial and economic transformation across many of today's wealthiest countries (Mikheeva and Ryan-Collins, 2022). This approach enabled South Korea, for example, to become one of the most dominant industrial powerhouses and exporters of the 21st century in less than four decades (see Box A3).

Their response to COVID-19 demonstrated that Ministries of Finance can be flexible, innovative leaders, tackling the challenges of the day to protect citizens and businesses. During the early months of the pandemic, some reached new heights of popularity as crisis managers, winning praise for their leadership, innovation and decisive actions to protect lives and livelihoods. Globally, over US$18.16 trillion was 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., 2022). As well as highlighting the potential of Ministries of Finance as active investors in the economy, this spending led to renewed debates about the current fiscal rules governing government spending on investment (see also Function 3a in Part B). Similarly, the role that many Ministries of Finance played in responding to the 2008 Global Finance Crisis demonstrates just how fundamental their leadership can be in a national crisis (see Box A3). Ministries of Finance that can bring similar qualities to bear to tackle the climate crisis, and in rethinking 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.

Box A3. The powerful role played by Ministries of Finance in 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

In the UK, 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 global financial crisis was marked by relative financial stability and so in 2007 few Treasury staff had any direct experience of managing a crisis and only a small policy team within its walls was 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 Northern Rock crisis to about 120 officials working directly on financial stability in the summer of 2009, by redeploying staff from elsewhere in the Treasury, as well as through new recruitment. With many new staff, the induction process was found to be important, and a formal induction program was launched.
- **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 cut back.
- **Drawing on pockets of expertise in-house** 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. This meant that mainstream Treasury officials built up 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 to manage the asset protection scheme. These bodies had more flexibility in recruitment than the Treasury, and so were more easily able to attract people with relevant expertise (HM Treasury, 2012).

Lessons for Ministries of Finance from the UK case study 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 a political priority.
- Tackling climate change will require Ministries of Finance to develop and utilize new knowledge, skills and capabilities. Like the UK Treasury, Ministries could consider setting up crack units, which can leverage new expertise internally and externally.

- Ministries of Finance will need to embed new climate skills change in their operations and training. They can learn from the UK Treasury's experience of developing programs to fill gaps in in-house skills and capabilities.
- The UK Treasury's experience of dealing with the global financial crisis demonstrates that 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 Korean Ministry of Finance and Economic Planning board (now part of the Ministry of Finance) played an active role in driving Korea's industrialization under President Park.

Under the rule of Park Chung Hee (1961-1979), Korea experienced rapid economic growth and industrialization (Irwin, 2021), 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 (Kim, 1991). Park's government played an active role in controlling the process of economic development from the start (Kim, 2017).

- One of Park's first acts in government was to **create the Economic Planning Board (EPB),** now part of the Ministry of Finance (IIE, 2003). The EBP was responsible for inter-ministerial policy coordination and developing the series of five-year plans that guided South Korea's development. 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. Korea's development strategy was focused on export-led industrialization (Kim, 2019), so the government directed policy measures heavily towards sectors with high export potential.
- **The EPB formed coalitions with other sectoral ministries** to encourage export-led growth. The EPB controlled the government's budget and so had power to influence the other economy-related ministries of the Ministry of Finance and the 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, 1992).
- **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 towards the outcomes the government desired. This enabled Korea to respond to changing global markets and the country's 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 commercial banks, development 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 Korea's experience for today's Ministries of Finance include:

- Ministries of Finance can learn from the active role that Korea's EPB and Ministry of Finance played throughout the country's development, in directing and supervising other actors to drive rapid change in targeted sectors.
- Ministries of Finance have a central position in government and can ensure that action on climate is integrated across the entire economy. The role played by Korea's EPB in spearheading and coordinating the government-wide development efforts is instructive for other Ministries of Finance because it demonstrates the need to employ a whole-of-government approach to tackling the climate challenge.
- The Korean example also demonstrates how 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.
- Korea's development experience shows that a long-term strategy can help to guide the actions of different players towards 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 (Grantham Research Institute), with input from Youngsun Koh (Ministry of Finance, Korea)

The nature of the climate challenge and opportunity will require Ministries of Finance to urgently bring similar qualities to bear to tackle the climate crisis and increase the resilience of their economies. Those that can bring these qualities 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 and sustained drivers of the zero carbon, climate-resilient economy, coordinating across the full range of economic, fiscal, and financial policy agencies.

The Coalition of Finance Ministers for Climate Action demonstrates that Finance Ministers can also work together as a global family to identify collective challenges and work jointly towards shared solutions. The benefits of the zero carbon, climate-resilient economy can be captured more quickly and efficiently through collective efforts, on policies such as carbon pricing, international climate financing, investment in new technologies, and greening the global financial system. Seventy-nine 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.

Ministries of Finance cannot act alone and should seek to promote a collaborative approach. Climate action requires structural transformation, investment and innovation across all sectors of the economy. This demands strong cross-agency collaboration and integrating climate action into the decision-making of all government departments. While Ministries of Finance play a key role, Ministries of Environment, Energy, Transport, Planning, Development and many others have an equally critical part to play—and many 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 budgets. It is equally important that Ministries of Finance work alongside and support Ministries of Environment, Climate and Development in the key international climate processes and fora, such as the UNFCCC Conference of the Parties and in designing national climate strategies.

The urgency of action and need to scale up investment

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, with existing commitments still falling 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 nationally determined contributions (NDCs) points to a temperature rise of 2.4–2.6°C by the end of the century (UNEP, 2022). 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 US$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 US$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 US$11 trillion in 2018 still largely invested in higher 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 US$18 trillion spent on recovery and rescue, less than US$1 trillion (around 5%), can be considered green (O'Callaghan et al., 2022).

Global investment to mitigate and adapt to climate change needs to be significantly increased. Climate action, at its heart, is characterized by transformation in all the key systems and related sectors of an economy (New Climate Economy, 2018). To achieve this transformation, many countries will need to increase their investments in all forms of capital—physical, human, natural and social—to reverse the trends of slow growth, declining investment and low public spending that have followed the global financial crisis and COVID-19; and to bring some emerging markets and developing countries back from the brink of a collapse in investment (Coalition of Finance Ministers for Climate Action, 2021b). A range of estimates now exist,[6] covering different locations and sectors, estimating investment needs from both the public and private sectors:

- The IEA (2021) has analyzed a net zero by 2050 scenario and estimates that global annual investment in the energy sector will need to reach US$5 trillion by 2030. This is more than double the US$2 trillion average annual investment the energy sector received in 2016–2020.
- Vivid Economics (2021) estimates global investment is needed of US$2.6 trillion per year from 2021–2025 and US$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 US$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 US$2–2.8 trillion per year by 2030.

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 3–4% in emerging markets and developing countries (Stern et al., 2021; Bhattacharya et al., 2022, Songwe et al., 2022). Yet less than US$653 billion in annual climate investment was deployed in 2019/20 (CPI, 2022), with a particular shortfall in adaptation finance, which is five to 10 times below current needs (UNEP, 2022a).

While an investment push is needed in economies across a wide range of areas, investment should be prioritized (Songwe et al., 2022) in areas including:

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 and distribution as well as storage and backup capacity, and the acceleration of the coal phase-out. The decarbonization of energy end-use will require action on transport, including building low emissions transport infrastructure and the electrification or conversation to hydrogen of all transport 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

[6] See Table A2.2 page 90 in Songwe et al. (2022) for an overview. It is important to note that these mainly focus on energy transformation, and to a lesser extent natural capital. There is substantial uncertainty on the costs of adaptation and resilience, as well as 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 the estimates are on the conservative side (World Bank, 2022a).

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 transition to a net zero, resilient economy. A just transition ensures a fair and wide distribution of the benefits of the transition as well as targeted support for those individuals, businesses, organizations, and regions that may be adversely impacted. Investments will be needed in the form of targeted programs—e.g. to retrain workers—and to build and expand social safety nets.

The different proportions of capital that will need to come from public, private, and international sources for these investments 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 therefore 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, as well as countries with less developed capital markets, provide a more challenging environment for private investment and will require governments to play a more active role. In addition, governments will have a key role in putting in place the supporting policies for private investment to materialize, including de-risking throughout the investment cycle.

The good news is that there is sufficient global capital and liquidity to close these investment gaps (IPCC, 2022) 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 will be essential (ibid.). However, this agenda is not just about governments investing more, it is also about spending more wisely and shifting away from investments that lock in unsustainable development pathways (Eguino & Delgado, forthcoming). 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 US$500 billion of capital available globally each year that could be reallocated towards the transition (ETC, forthcoming).

Delivering this funding will require nothing less than a transformation of the global financial system - as the Conference of Parties explicitly recognized for the first time at COP27 (UNFCCC, 2022b). Ministries of Finance can be drivers of this transformation. Not only do they have a key role to play in raising and redirecting public and private capital towards climate action by laying out clear national strategies and investment plans, creating the right fiscal policies, and upgrading financial instruments within responsible macroprudential frameworks. They also hold considerable leverage over other key actors in the financial system, including central banks, commercial banks, and multilateral development banks, and can encourage them to shift towards a net zero aligned financial system.

Strengthening the role of Ministries of Finance to act on climate

To get their economies on track to reach net zero and unlock the investment needed, Ministries of Finance now need to strengthen their roles considerably. They will have to help tackle the wide range of market and non-market failures that sit at the heart of the climate challenge, and which lead to underinvestment in the new economy. These include the negative externalities of emissions, but also knowledge spillovers, infrastructure lock-in, network externalities, co-benefits, split incentives, information costs, and coordination problems (Stern, 2022a). They demand that Ministries of Finance act across a wide range of areas governing key aspects of macro, fiscal, and financing policy. There are no 'silver bullets' to climate policy; initiatives such as carbon pricing and subsidy reform need to be complemented by many other measures in smart packages of reinforcing fiscal, regulatory, and financing measures to unlock the investment needed to meet the speed and scale of the challenge.

Strengthening functions

To strengthen their roles, Ministries will need to mainstream climate action into key functional areas routinely carried out as part of their core responsibilities. These typically include macroeconomic and investment strategy, fiscal policy and regulatory and supervisory functions. 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. Hence, these act as 'key entry points' for mainstreaming climate action within the core functions of Ministries of Finance (see Table A1), and the starting point for the framework presented in Part B.

Table A1. Mainstreaming climate action in core Ministry of Finance functions

Thematic area [Alignment with Part B Framework]	**Core Ministry of Finance functions**	**Opportunities for mainstreaming climate action**
Macroeconomic 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 including by assessing investment needs for the net zero, climate-resilient transition, including through identifying and developing bankable projects and programs
Fiscal policy and budget management [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

Thematic area [Alignment with Part B Framework]	**Core Ministry of Finance functions**	**Opportunities for mainstreaming climate action**
Budget management	• Formulation of multi annual expenditure frameworks and annual budgets 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, green 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 financing sector (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 voluntary carbon markets, and country platforms)

Source: Adapted from Allen at al., 2015, 2016 which summarizes the core policy / regulation/ transactional functional areas covered by most Ministries of Finance. This is updated to identify key 'entry points' for mainstreaming climate action.

*Areas most often shared with independent agencies or other agencies, as per Allen et al., 2015, 2016. See also intersection with analytical capabilities.

Enhanced action by Ministries of Finance will require them to work hand-in-hand with other line ministries and actors across these functional areas. It is especially important that they actively enable and support the leadership of line ministries and other actors, including through the power of the budget. They will also need to work in a co-leadership role in other areas, alongside taking a lead in policy areas for which they are directly responsible. Table A2 provides a snapshot of the typical split of responsibility.

Table A2. The Role of Ministries of Finance in climate action across core functional areas vis-à-vis 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/transport/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 systems
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 including by assessing investment needs for the net zero, climate-resilient transition, incl. through identifying and developing bankable projects and programs • Fiscal incentives and regulation for transforming key sectors such as energy, transport, 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 bonds for sustainable investment • 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: Based on Table D1 in the Annex and other sections of the report.

Strengthening capabilities

To deliver on this agenda, Ministries of Finance will need to overcome the systemic barriers and institutional inertia that hamper their more active engagement in the climate agenda. 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 (Coalition of Finance Ministers for Climate Action, 2022c; Mikheeva and Ryan-Collins, 2022; Orozco and Jaramillo, 2021, interviews for this report):

- **Limited awareness and willingness** at the main levels of leadership within Ministries to Finance 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 an economic issue, that belongs under the purview of environment or dedicated climate change ministries.
- **Concerns about risks to the tax base** from electrification and phasing out fossil fuels.

- **Weak institutional basis** for involvement, including a lack of explicit mandates formalizing the Ministries' role to help drive climate action, and a lack of coordination with line ministries.
- **Limited expertise and technical capacity**, including a limited number of staff with climate-specific expertise and 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 hesitance to make active use of fiscal policy and tax incentives, earmarking of tax revenues, green taxes, and non-market mechanisms to drive climate action.
- **A natural skepticism towards new spending commitments,** connected to the Ministries of Finance's role in the budget process.
- **A lack of cross-sectoral thinking,** due to Ministries of Finance traditionally being organized along sectoral lines.
- **Preoccupation with current macroeconomic challenges,** without sufficient attention paid to the connections between climate action and tackling current macroeconomic crises.

In many cases, Ministries of Finance will need to place a special emphasis on overcoming acute challenges in their capabilities to act on climate. Interviews for this report demonstrate that Ministries of Finance often know 'what' strategies and policies are needed but require leadership, stronger mandates and institutional set-ups, and better staffing and technical capabilities to act. These gaps significantly hamper the ability of Ministries of Finance to deliver on the core functions outlined above. Table A3 summaries the capabilities that are most relevant.

Table A3. Ministry of Finance capabilities needed for climate action

Thematic area [Alignment with Part B Framework]	**Core Ministry of Finance capability**	**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 MoF 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
Coordinative [Capability 2]	Processes for coordination, and collaboration	• Processes for driving effective collaboration on climate action with other public agencies, private sector, civil society, MDBs, 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

Source: Drawing on various including World Bank (2013) which looked at internal capabilities of Central Finance Authorities and informed by (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).

The remainder of this report presents a framework that Ministries of Finance can use to inspire action on this agenda and to inform reforms to their core functions and capabilities. It highlights some of the many examples of visionary leadership by Members of the Coalition of Finance Ministers across these functions and capabilities. These provide strong reasons for hope and optimism.

Examples include members shaping national climate strategies and mainstreaming climate into development strategies. Some countries are introducing a range of progressive fiscal and other public policy reforms including carbon taxation, subsidy reform, fiscal incentives in the energy sector, and reforms to taxation of extractive industries, vehicle ownership, land, and property. Some are utilizing the power of the public purse via the budget, public procurement, and bond financing to help drive economy-wide climate action. Major efforts are being made to introduce national disaster and recovery funds and insurance mechanisms, and future proof the public finances. Some Ministries of Finance are also taking steps to enhance their capabilities. Some countries are redefining their roles and mandates across the board. Others are setting up dedicated climate units to drive action across the whole-of-government. Some are radically upskilling their teams. A snapshot is provided in Tables A4 and A5. However, despite these positive examples, more work needs to be done by Ministries of Finance everywhere to systematically integrate climate into their core functions and capabilities.

Table A4. Examples of Ministries of Finance good practice in the functions detailed in Part B

Action area	Country examples	Page Number
Function 1: Reforming macroeconomic strategy through shaping national plans and transition strategies (Helsinki Principles 1 and 6)		*To be added*
Nationally Determined Contributions (NDCs)	- Rwanda MINECOFIN leading on NDC revision - Sudan MOFEP as a focal point in NDC implementation - Norway MoF responsible for NDC Economic Measures	
National Adaptation Plans (NAPs)	- Fiji MoE costing the NAP - Togo aligning the NAP process with national budget planning	
Long-Term Strategies (LTSs)	- UK's launch of Net zero Strategy with HM Treasury involvement - Burkina Faso's MoF involved across all stages of LTS process	
National development strategies	- Uganda MOFPED's National Development Plan and Green Growth Strategy - Nigeria MoF leading the National Development Plan	
Industrial and innovation strategies	- China providing incentives for renewable energy and electric mobility - Morocco's green industrialization strategy - Japan's Green Growth Strategy as a part of industrial policy **- Korean Ministry of Finance board driving industrialization***	
Investment strategies and needs assessment	- Rwanda MINECOFIN identifying investment needs as part of NDC - Saint Kitts and Nevis assessing investment barriers as part of NDC - Finland's MoF part of cross-ministerial green transition finance working group	
Project Pipelines and Prioritization	- Kiribati's NDC Investment Plan including a project pipeline - Indonesia MoF's KPPIP coordinating infrastructure planning - The UK establishing the new UK Infrastructure Bank	
Function 2: Reforming fiscal policies and the budget process (Helsinki Principles 3 and 4)		
Economic incentives and fiscal policy	**- Role of MoF in driving energy sector transformation in Uruguay** - Indonesia raising gasoline and diesel prices - India eliminating diesel subsidies - Finland, Argentina, Colombia, Chile and Canada introducing carbon pricing	
Smart Policy Packages	- Chile's MoF introducing an integrated Green Finance Strategy - Sweden introducing revenue-generating policy instruments - China adjusting fiscal incentives for polluting firms	
Future-proofing public finances	- Costa Rica introducing Green Tax Reform led by MoF - Switzerland introduction of road user charging - US piloting road use charges as substitutes for fuel tax	
Managing fiscal risks	- Bahamas' MoF identifying climate infrastructure investment opportunities	
Expenditure and budget frameworks	- France MoF preparing a Green Budget - Nepal's MoF including a Climate Budget - Canada's Strategic Environment Assessment for policy and program proposals	

Action area	Country examples	Page Number
Greening public investment management	- Mexican MoF's sustainability indicators for public investments - Ethiopia's public investment management guidelines - Costa Rica's disaster risk analysis in National Public Investment System	
Green procurement	- Costa Rica authorizing green public procurement	
Function 3: Reforming financial policy and the financial system to raise, steer and blend finance (Helsinki Principle 5)		
Broadening the tax base	- Rwanda Revenue Authority under MoF implementing reforms to tax collection	
Debt financing, including through green bonds	- Belize signing a debt-for-climate swap - German sovereign green bonds - Fiji dedicating green bonds to adaptation measures - Chile and Uruguay issuing a sovereign sustainability-linked bond	
Sub-sovereign finance	- UK Treasury and City of London use of land-based financing - Uganda's MOFPED improving tax administration and collection - Johannesburg and Mexico City issuing green bonds	
Greening NDBs and GIBs	- Germany's KfW investing in environmental protection - Bancoldex in Colombia financing low-carbon public transport	
Leveraging sovereign wealth funds and state-owned enterprises	- Norway's Government Pension Fund Global plans with support of MoF - Italy's CDP Green, Social and Sustainability Bond Framework mandated by MoF - MoF in New Zealand issuing investment framework for Superannuation Fund - Temasek integrating climate into its strategy in Singapore	
Reforming central bank activities	- UK Treasury changing the remit of the Bank of England's Monetary and Financial Policy Committees	
Greening the financial sector	- Netherlands NCEP financial sector commitments - Luxembourg launching Sustainable Finance Initiative - Germany MoF launching a Sustainable Finance Strategy	
Innovations in financial models	- Indonesia creating an international framework for blended finance - The EU launching its External Investment Plan	
Green finance roadmaps	- Australia, the UK, Netherlands, Norway, Indonesia and Luxembourg developing green finance roadmaps	
Disaster risk finance and insurance for all	**- Jamaican MoF participating in developing risk financial strategy**	
Leveraging MDB and DFI capital	- BNDES in Brazil financing green development projects - NAFIN in Mexico supporting international climate finance projects - Rwanda Green Fund (FONERWA) as a vehicle for climate finance	
Accessing voluntary capital markets	- South Africa issuing carbon credits - Congo Basin countries developing a harmonized framework for carbon credits	
Country platforms	- South Africa launching International Just Energy Transition Partnership	
Cross-cutting		
Ensuring a just transition	**- Irish MoF using carbon taxation to support a just transition** - Canada's Just Transition Task Force mitigating social impacts of transition - Spain's just transition agreements for climate-affected regions	

*Bold = detailed case study provided

Table A5. Snapshots of Ministry of Finance climate leadership to enhance core capabilities detailed in Part B

Action area	Country examples	Page Number
Capability 1: Leadership and governance (Helsinki Principle 2)		*to be added*
Revamping MoF mandate on climate change	- US Treasury's key role in climate initiatives - Germany's new climate law shifting focus in MoF - UK adopts Net Zero Strategy - Disaster risk driving climate action in Bahamas's MoF - MoF Uruguay's mandate changes through budget law - Peru's MOEF engaging in policies aimed at negative climate externalities **- Denmark MoF's update of its mission statement**	
Developing internal Ministry of Finance strategies on climate change	- US Treasury Strategic Plan includes 'Sustainable Treasury Operations' - Irish DoF's Statement of Strategy promotes sustainable goals - New Zealand Treasury's Strategic Intention aims to navigate climate change - Finland's MoF secures future prosperity - Chile published Financial Strategy on Climate including the role of MoF	
Enhancing governance and organizational set-up	**- Fiji MoE setting up a Climate Change and International Cooperation Division** - India creating the Climate Change Finance Unit within the MoF **- Denmark's MoF setting up a Centre for Climate, Green Economy and the EU** - Ireland's Department of Finance establishing a Climate Unit - MoF Chile establishing the Green Finance Unit - Climate Finance Unit established within MoF in Uganda - The UK setting up an expert team at HM Treasury **- The US Treasury creating a Climate Hub**	
Capability 2: Coordination and collaboration (Helsinki Principles 2 and 4)		
Improving collaboration and coordination	- Sudan's coordination of NDC implementation led by the MoF - Institutional involvement of MoF in NDC implementation in Jordan - US whole-of-government approach with assistance of the Department of Treasury **- Denmark setting up a Climate Task Force** **- Uganda's MoF role in coordination of climate response** **- MoF in Chile creating the public-private green finance roundtable** - DoF in Ireland creating a climate economy group	
Capability 3: Human capacity, expertise and economic decision-making (Helsinki Principles 2 and 4)		
Upgrading skills and expertise	**- EC supporting the implementation of green budgeting among EU Members** **- IDB providing support on green fiscal policies** - Nordic Council of Ministers research journal and meeting on modeling - UK Treasury and the Green Technical Advisory Group - Irish DoF's joint research program with Social Research Institute - US Treasury Climate Literacy Program **- UK Treasury building capacity to respond to the Global Financial Crisis**	
Enhancing analytical capability	- Denmark's GreenREFORM Model	

*Bold = detailed case study

Part B. A Ministry of Finance framework for climate action

Introduction

This part of the report details a framework that Ministries of Finance can use to mainstream climate action into their operations by enhancing their core functions and capabilities to act on climate in several 'action areas'. The areas are directly related to implementing the Helsinki Principles.

In-line with Tables A1 and A3, the framework is organized around three 'core functions' and three 'core capabilities' that are features of Ministries of Finance:

- **Core functions** are those routinely carried out by Ministries of Finance as part of delivering their core responsibilities.
- **Core capabilities** are those that impact the ability of Ministries of Finance to fulfil their core functions.

Each function and capability is broken down into several action areas.

The three functions that can be enhanced for Ministries of Finance to mainstream climate are:

- **Function 1: Reforming macroeconomic strategy through shaping national plans and transition strategies** for sustainable, inclusive and resilient growth, in partnership with others *(Helsinki Principles [HPs] 1 and 6)*
  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** for the net zero, climate-resilient transition
  - **1e: Identifying and developing bankable projects and programs**
- **Function 2: Reforming fiscal policies and the budget process** through reforming tax systems, macroeconomic incentives and mainstreaming climate in the budget *(HPs 3 and 4)*
  Reforming tax systems and macroeconomic incentives
  - **2a: Transforming macroeconomic incentives through carbon pricing, subsidy reform and other fiscal policy measures**
  - **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
  - **Conclusion: Combining instruments into smart policy packages** to drive transformation

  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: Reforming the financial system and instruments** to raise, steer, and blend finance at unprecedented speed and scale from a wide range of domestic, private and international sources *(HP 5)*
  - **3a: Mobilizing domestic revenue to finance investment**, including through debt financing, green 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 voluntary carbon markets and setting up country platforms

Ministries of Finance do not typically lead on the development of national climate strategies or investment strategies (Functions 1); they develop these in partnership with other line ministries and support them 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 be bought into) what overall national objectives need to be delivered through fiscal and financing policy 'downstream', potentially undermining ambition and implementation.

The three capabilities Ministries of Finance can develop to play a more active role in climate action are:

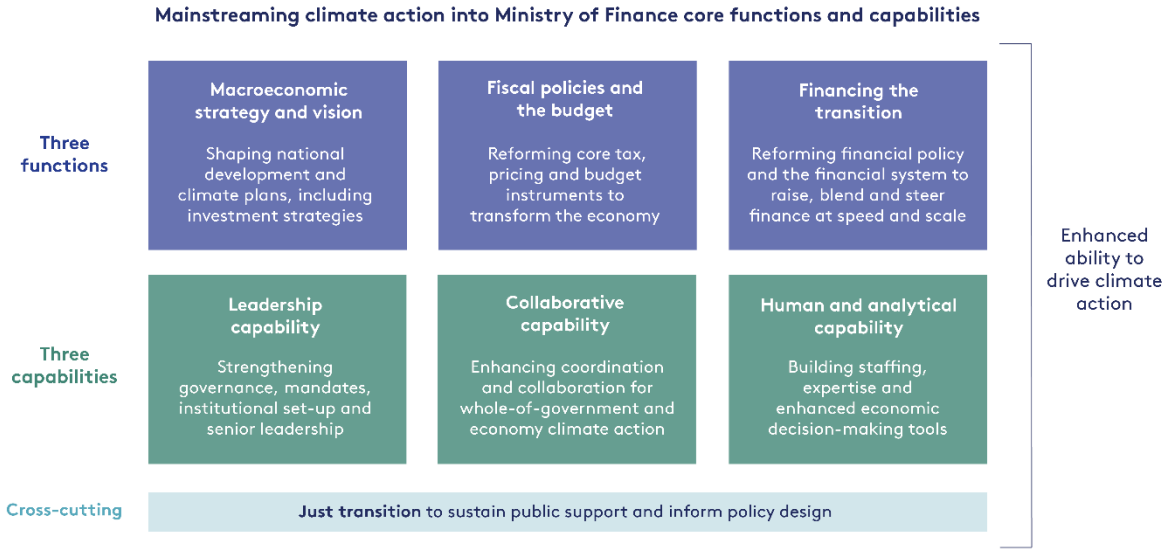
- **Capability 1: Strengthening leadership for climate action** through a revamped vision, mission, and mandate and institutional set-up for climate action to provide strategic clarity on the direction of travel *(HP2)*
  - **1a: Strengthening the mandate** of Ministries of Finance
  - **1b: Developing organizational climate strategies**
  - **1c: Formalizing governance structures and organizational set-up**
- **Capability 2: Enhancing collaboration and coordination** within and outside government for a whole-of-economy approach to climate action *(HP2)*
- **Capability 3: Building human capacity, expertise and economic decision-making tools** for climate action *(HP2 and HP4)*
  - **3a: Enhancing skills and expertise** of ministerial staff
  - **3b: Enhancing economic decision-making tools and data-driven analysis** to inform decision-making

One cross-cutting issue is particularly important: the critical need for Ministries of Finance to drive forward a just transition to sustain public support and inform effective policy design. Discussion is also provided throughout of the need for Ministries of Finance to navigate the broader domestic and global environment and political economy helping or hindering action on climate.

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
- Key opportunities for action—suggested options and ways forward for Ministries of Finance
- Further reading and resources *[to be added]*

Figure B1. Ministry of Finance framework for climate action



Source: Authors' compilation

All these functions and capabilities are inextricably linked. Strengthening one but not the other 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 discernible benefit. Alternatively, a Ministry may have the upfront capacity to develop a new analytical tool but not the in-house skills to maintain and upgrade it over time. This underscores the need to consider comprehensive reviews 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 is discussed further in Part C.

Using the framework

The remainder of this guide outlines a wide range of opportunities for action that can be considered by Ministries of Finance, within the structure of the framework. Each Ministry of Finance will have to prioritize and sequence the steps it takes and consider the unique context in which it operates. 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.

Encouraging Ministries of Finance to develop smart packages of mutually reinforcing strategies, investment plans, policies, and financing measures is one of the overriding objectives of the framework, to take advantage of the interactions between measures.

Function 1. Reforming macroeconomic strategy through shaping national plans and transition strategies

[Helsinki Principles 1 and 6]

This section 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. Function 1 spans five action areas, divided into two parts:

Shaping national climate and development strategies

- **Function 1a: Participating in the development and implementation of climate strategies**, including:
  - Long-Term Strategies,
  - Nationally Determined Contributions and
  - National Adaptation Plans.
- **Function 1b: Greening national development and sector strategies.**
- **Function 1c: Shaping 21st century industrial and innovation strategies.**

Shaping investment and transition strategies

- **Function 1d: Developing investment strategies including by assessing investment needs** for the net zero, climate-resilient transition.
- **Function 1e: Identifying and developing bankable projects and programs.**

Shaping national climate and development strategies

Introduction

The zero carbon, climate-resilient transition will demand that Ministries of Finance play an important role in placing climate action at the heart of national development through active participation in developing national climate strategies and integrating climate action into national development plans.

By embedding climate action within national development priorities, governments and Ministries of Finance can achieve their core economic and social objectives, at the same time as tackling climate risk. Most governments still have a long way to go to embed climate action within national development priorities, and to see climate action as a key driver of economic prosperity and competitiveness. The insufficient policies and measures currently outlined in the latest NDCs, as well as the limited attempt to 'green' the recovery from COVID-19, indicate a lack of integration between climate and national development priorities. Despite evidence to the contrary, which demonstrates the strong link between climate action and good development (see Part A), this is exacerbated by the perception of strong trade-offs between climate and development combined with an implementation gap that needs to be urgently addressed through active public policy and financing.

Ministries of Finance therefore have a central role to play in both the design and implementation of national climate strategies and strongly integrating climate action within national development priorities. Proactive engagement by Ministries of Finance in policy debates can play a critical role in bridging knowledge gaps on the economic case for action while maximizing the synergies and reducing trade-offs. Working closely with the respective lead agency, typically Ministries of Environment,

Ministries of Finance can ensure that plans are backed by clear investment strategies, that this investment is unlocked by supporting macro, fiscal, and other polices, and can then be financed through a mix of public, private, and other sources of capital. These elements are covered in further detail in the 2nd part of Function 1, as well as Functions 2 and 3.

Function 1a. Participating in the development and implementation of climate strategies[7]

Introduction

Long-Term Strategies (LTSs), Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) are key national climate planning instruments. They are also excellent tools to help Ministries of Finance identify key investment and budget priorities, and other ways to integrate climate action into their day-to-day activities.

Ministries of Finance need to systematically engage more with these national planning processes. With proper engagement, Ministries of Finance can ensure that plans are adequately costed and that they consider their financial implications, 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, such as Ministries of Finance, 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).

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, while only 11% of members have no engagement at all in NDC formulation, validation and implementation processes, 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. 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 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), leading to a misalignment between NDCs and the long-term targets. There is thus a need for Ministries of Finances 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 all three key stages of the climate plan process. This includes:

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

- **Formulation:** (i) Ensuring robust evaluation of policies, measures and scenarios from economic and fiscal perspectives, including that the measures proposed consider costs and benefits, and are reliably costed. (ii) Ensuring robust governance processes and making use of their convening power to support and coordinate the ministries responsible for formulation and implementation, and the involvement of the private and third sectors. (iii) Identifying relevant fiscal and public policy levers for building an enabling environment for implementation.
- **Implementation:** (i) Mainstreaming measures and policies outlined in climate plans into national planning, decision-making and budgeting processes under the purview of the Ministries of Finance and work with line ministries to integrate plans into sectoral budgets (as discussed in Functions 2 and 3). (ii) Ensuring adequate resourcing for implementation, including by developing dedicated implementation/financing plans.
- **Monitoring and revision:** (i) Developing systems to monitor implementation and track climate finance (ii) Feeding lessons into the plan's next iteration.

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.

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.

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 (LTS). LTSs are encouraged under the Paris Agreement and this was further stressed in the Glasgow Climate Pact adopted at COP26 in 2021, urging countries to develop long-term strategies 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 long, medium and short 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).

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, 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 understand 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.

More specifically, engagement by Ministries of Finance in the LTS process offers them a range of important benefits. These include improving their 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 investments. 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 to address climate crisis (see Function 3).

Real world examples

Compared to NDCs, developing long term development strategies is still a relatively novel process and there often less strong involvement by Ministries of Finance. Yet, there are strong emerging signs of Ministry of Finance leadership by certain countries. Further examples are also outlined in the Helsinki Principle 1 reports.

- The **UK** launched its Net Zero Strategy in 2021 with the goal to lower greenhouse gas emissions to 'net zero' by 2050. The strategy lays out the UK's vision for a decarbonized economy, as well as guidelines and steps to take across key sectors to keep the UK on track for its NDCs and upcoming carbon budgets—five-year statutory caps on total emissions set by the UK's Climate Change Committee. The strategy sets targets to reduce emissions for each sector of the economy and for capturing the remaining emissions with green carbon capture technologies or natural carbon sinks. The development of the UK's Net Zero Strategy was supported by the Treasury from the beginning. The Treasury assesses the fiscal implications and risks of the transition as well as 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 also assessed the key issues for the UK economy as it decarbonizes, including costs and benefits of the transition, household impacts, the effect on government finances, and the economy's competitiveness.

- In **Burkina Faso**[8], the Ministry of Finance was involved in all stages of the LTS process, including: (i) leadership in sectoral groups to ensure the integration of the cross-cutting finance in the development of LTS pathways; (ii) in the LTS Technical Monitoring Committee, the scientific and technical body charged with analyzing the quality and relevance of the data and documents collected, and proposing options for LEDS implementation; (iii) the LTS Steering Committee; and (iv) leading the support and review of technical aspects of the LTS strategy.
- In the case of the **Ethiopian** LTS, the 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, cutting across other aspects of this report:

- In **Chile**, a macroeconomic evaluation of their net zero objective found that enhancing the set of 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 (IADB, 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 promote an integrated model of value creation in the long term, in which the social, environmental and economic dimensions are incorporated in a balanced manner.
- Similarly, with regard to understanding the implications of LTS for the domestic economy**, North Macedonia** 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.
- To estimate investment needs, **Cambodia** assessed the investment needs for the LTS and estimates that the public financing needed for the LTS will amount to almost US$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 remaining requirements.
- To increase access to sources of finance, **Costa Rica**'s LTS defines short-term policy actions which formed the basis for policy-based loans from the IDB, the French Development Agency (AFD), and the World Bank. The LTS also establishes a list of priority issues for which the government is requesting support, thus allowing the Ministry of Finance and the rest of the government to coordinate technical assistance from international donors.

[8]Case studies on Fiji, Ethiopia and Burkina Faso were provided by Aaron Drayer (GGGI)

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 towards the achievement of the goals of the Paris Agreement. Successful NDC implementation and continuous enhancement is 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 reported any estimates of the cost of NDC implementation (Caldwell et al., 2022)hampering the ability of Ministries of Finance to then channel resources to climate activities, including to create jobs and reduce poverty. Indeed, 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, the Ministries of Finance are now leading the NDC preparation and implementation process (see below).

There are several reasons why Ministry of Finance engagement in NDC development and implementation is so important. Some of the most important reasons include (Coalition of Finance Ministers for Climate Action, 2020b, 2022f).

- **Ministry of Finance leadership and coordination strengthens the realization of climate benefits.** Ministries of Finance can play a key role in supporting 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, and international financing.** Ministries of Finance should contribute to the development of the 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. This can improve the chances of NDCs being designed as realistic and achievable commitments that can attract buy-in and investment.
- **Ministry of Finance leadership can ensure that NDCs contain the information needed for their successful implementation**. This includes 'SMART' objectives,[9] specific sectoral targets that are detailed and costed, implementation options and financing strategies. If these are missing in existing NDCs, countries can also consider developing a dedicated NDC Implementation Plan as part of the implementation process (UNDP et al., 2020).
- **Ministry of Finance input to NDCs can help to mainstream climate action early on within national investment planning, fiscal policy, budgeting, and procurement processes.** The central role that Ministries of Finance can play in these respects is covered further in Functions 2 and 3.

[9] Specific, Measurable, Agreed-upon, Realistic and Time-bound

- **Ministries of Finance can lead 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).

Real world examples

There are a range of case studies that 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' of Finance involvement in the different steps of NDC development and implementation.

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

- 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 on the key 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). Ahead of COP26, the President of the Philippines recognized the important role of the Department of Finance (DOF) in mobilizing finance and ensuring resilience against climate impacts and disaster risks. He 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**,[10] 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.

- In **Chile,** the Ministry of Environment is the NDC lead agency, but a strong institutional framework that allows 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. Additionally, the Ministry of Energy calculated costs for mitigation options, while the Ministry of Finance provided the GDP forecast for modeling different scenarios. With this approach, the government developed a good understanding of the costs and benefits

[10] Contribution from Sujala Pant (UNDP)

associated with climate action, and so identified what could and could not 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. To inform the NDC and its measures, it regularly prepares projections of greenhouse gas emissions (Coalition of Finance Ministers for Climate Action, 2020b).
- In cooperation with the World Bank and with the support of the National Climate Change Response System, the Ministry of Economy and Finance in **Uruguay** has developed a macroeconomic model (DGE) for modeling the effect of the country's next mitigation targets on key macroeconomic variables, which is informing the preparation of Uruguay's second NDCs.

National Adaptation Plans (NAPs)

Context and role of Ministries of Finance

Increasingly, more frequent and damaging extreme weather events are highlighting the imperative for bold adaptation action; 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 and increase public debt (see Part A). Yet, despite growing awareness of the urgency of adaptation action—as well as the high benefit–cost ratio of investment—the scale of adaptation financing remains far below estimated existing and future needs. The UNEP Adaptation Gap Report (2022a) estimated that annual costs of adaptation in developing countries alone could range from US$160 billion to US$340 billion annually by 2030 and rise from US$315 billion to US$554 billion by 2050, with recent estimates of cost in the upper range of these estimates. Although there has been an increase in adaptation finance, it remains severely underfunded: the total annual adaptation financing amounted to only around US$56 billion in 2019/2020 (CPI, 2022).

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.).

However, Ministry of Finance involvement in NAPs so far has been limited, with much scope for enhanced engagement. So far, only 40 NAPs have been communicated to the UNFCCC (2022b) and most countries are still too focused on planning, as opposed to implementing the plans and translating 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 Ministries established a workstream on adaptation, and a first survey it conducted highlights 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, 2022c).

Ministries of Finance have an important role to play throughout all four 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 planning process to increase awareness and alignment, 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 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 well-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 in 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 finds 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 towards mobilizing finance. The International Institute for Sustainable Development (IISD) provides a guide for developing such strategies, a process composed of three main building blocks (IISD, 2022): (i) identifying the financing gap; (ii) identifying potential sources of financing; (iii) identifying operational next steps such as building capacity, fostering relationships with key actors or preparing specific proposals.

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 Ministry of Finance leadership on both planning and implementation:

- 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 mainstream into national policies, including the NDC and the country's development goals. The MOEFPD is taking steps to align the NAP process with its national development and budget planning cycle, identifying key entry points for integration 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).
- The Fiji Ministry of Economy has developed a methodology to provide rapid and comparable cost estimates for the 160 prioritized actions in Fiji's NAP, covering the period from 2021 to 2025. An excel-based tool, it has low data input requirements compared to most other economic models and is designed to be easily adapted and updated.

Barriers to action and ways to overcome them

Several major barriers currently prevent most Ministries of Finance from contributing to strong national climate strategy plans. 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:** The main constraints reported by Ministries of Finance in the Coalition's Helsinki Principle 6 2020 survey were human resources (53% of respondents) and technical capacities (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. In particular, there is a need to improve data availability and projections to inform macroeconomic and macro-fiscal modeling of climate change impacts and benefits. For LTSs, there is a particular lack of granular information on long-term transition pathways and technology options for net zero, while data on adaptation is often particularly challenging (Coalition of Finance Ministers for Climate Action, 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 development 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 process to track climate finance flows, particularly for adaptation.

To overcome these barriers, Ministries of Finance should consider climate planning a core part of their responsibilities, investing resources into the 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, that can also be used for LTSs and NDCs (see case studies and Capability 3). Such governance structures could include a *Steering Committee* that gives the political and strategic steer to the project; a *Technical Committee* that gives the technical directions for the elaboration, facilitates data collection, ensures work is tailored to the needs of respective ministries, etc., composed by 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 should be considered carefully.
2. **Investing in capacity, tools, and data:** To ensure productive engagement on climate plans, it is essential to create and/or strengthen the capacities of Ministries of Finance to understand and integrate climate change into their mandates and tools, as well as to strengthen their capacities and support to mainstream climate change into public financial management (PFM), 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 (see Functions 2a and 4).

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 of Finance does not need to hold all knowledge and skills immediately to begin the journey of engagement. Rather, it can be an iterative process which 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. The NDC Partnership, for example, 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. UNDP Climate Promise also 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 as well as 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 fully costed national climate strategies – including LTSs, NDCs and NAPs – by investing resources to engage in all phases of the process – 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 in place or under consideration, as well as 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 and 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 getting more engaged over time as expertise and experience deepen.
- Ensure **alignment across LTSs, NDCs and NAPs** and encourage 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 in the process.
- **Considering taking on overall responsibility for climate plan development to** drive action and investment across government, as globally twelve Ministries of Finance have already done (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 for socioeconomic development. Most governments have a long-term vision or plan, either explicitly or implicitly. In developing countries and emerging markets, the large majority of countries have a long-term vision and/or national development plan in place. These are sometimes reflected in five-year plans. National Development 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 many 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 both the public and private sector towards 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 responsible line ministry to ensure that all strategies are consistent, financeable and feasible and accompanied by a supportive 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 in line with climate targets (discussed in detail in Section F2).

Tackling climate change and achieving socioeconomic development are two of the biggest challenges many countries face. As discussed in Part A, the two challenges can only be solved together—integrating climate into national development planning is therefore crucial. Indeed, aligning NDCs, LTSs and NAPs with NDPs is key to understanding the co-benefits between climate action and sustainable development, and an opportunity to ensure that investments for development, mitigation and adaptation are mutually supportive.

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). As a function of their focus on implementing the Sustainable Development Goals (SDGs), NDPs often include some climate-related targets. Still, in many countries, climate plans and NDPs lack explicit alignment. For instance, a review of African NDCs and NPDs reveals "critical gaps, tensions, and disconnection" between the two documents (Okereke, 2021). As a result, climate targets are not being adequately fed into national planning and budgetary processes, resulting not only in less effective NDCs, and NDPs that are ill-prepared to tackle the climate crisis, but more generally in a missed opportunity 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 strong NDC and LTSs which are prepared in knowledge of the 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 which represent the key economic systems typically responsible for the majority of emissions: energy, cities, food and land use, water, and industry (New Climate Economy, 2018). NDPs typically have dedicated strategies for these sectors, and it is increasingly common to develop dedicated green sectoral strategies that map out climate transition plans for key sectors. These typically complement both NDPs and national climate strategies. While the process of designing sectoral strategies is usually led by the relevant line ministry, Ministries of Finance involvement is crucial for three reasons: (1) ensuring alignment with overall national climate and development strategies; (2) facilitating cross-sectoral coordination where necessary; and (3) informing the design of sector-specific regulations and fiscal incentives (see Function 2). 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).

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 towards climate change and a perception of 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 inputs 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 towards 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 of inaction on climate for development, as well as the many benefits climate action can bring. Thus they have a greater understanding for 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 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 (see also Capability 3).

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, which the Ministry of Finance may have limited influence over. 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 towards net zero.

Real world examples

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

- In **Nigeria**, the Ministry of Finance-led National Development Plan contains a chapter on environment and disaster management and contains 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.
- When the current **Irish** government took office in 2020, it 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.
- **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 a key factor in ensuring effective and appropriate allocation of funds within the annual budgets and subsequent implementation of climate change priority actions (see Box B19).

Sectoral plans can also form part of broader decarbonization strategies:

- Both **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 same tripartite structure has 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.

Opportunities for action

Ministries of Finance should help to integrate climate action in National Development Plans and sector strategies especially related to energy, land-use, cities, industry, and water. In order 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 and measures (see Function 1c).
- Ensure that their own departmental strategy documents integrate climate priorities (see Capability 1).

As part of these processes, Ministries of Finance should consider developing green sector strategies for the key economic systems which typically drive carbon emissions and vulnerability to climate change: energy, land-use, cities, industry, and water.

Function 1c. Shaping 21st century industrial and innovation strategies[11]

Context and role of Ministries of Finance

Climate action requires major structural transformation in 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 including green hydrogen, battery manufacturing, and new forms of urban mobility, which will itself lead to 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 towards better societal outcomes through macroeconomic or sector-specific incentives such as by financing innovation directly or provision of subsidized credit to new growth industries (Hausmann and Rodrik, 2003; Mazzucato, 2021; Rodrik, 2014)

The use of fiscal 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). This 'first-mover-disadvantage', with innovators having to cover the cost of innovation, but sharing its benefits with imitators as costs fall over time, creates incentives not to innovate. Moreover, there is often a lack of data on the financial and risk performance of long-term infrastructure projects using new technologies, making the investment evaluation process problematic and deterring potential investments. This may have to be corrected by subsidizing both innovation and efforts to scale up new technologies for mass markets. Mazzucato (2021) therefore argues that public investment is crucial for transformative innovation given its long-term and risky nature. 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 on non-conventional renewable energy projects, as well as soft loans (OECD, 2022c).
- **Externalities and other market failures:** Sustainable infrastructure has significant positive externalities for the economy which cannot be wholly appropriated by private sector investors, thus reducing their risk–reward profile. Conversely, the negative externalities associated with unsustainable infrastructure 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 which lead to undersupply of capital. Moreover, the economics of renewable energy are different from those of 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 its cost is high. More generally, it is recognized that carbon pricing is not sufficient to incentivize the greening of the entire energy system (Rosenbloom et al., 2020), with complementary tools needed, such as R&D subsidies or tax exemptions.

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

- **Institutional and coordination failures:** The transition will require cross-sectoral coordination. For instance, electric vehicle adoption might require coordination between the transport, industry, research, and energy sectors, including investment in the grid and charging infrastructure which creates network externalities. Thus, coordination across ministries is often essential to design policies and investments which tackle the different overlapping bottlenecks to avoid coordination failures.

The use of targeted fiscal incentives for 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. Ministries of Finance can play a key role, working closely with other line ministries, in several key areas:

- **Setting strategic objectives:** Creating the economy and industries of the future requires a multi-year policy orientation. The fiscal space required for the public sector to invest in catalyzing the industries of the future requires the integration of these needs into the budget cycle. This requires leadership by 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 once the ground has been laid (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 policies 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 provide capacity building to other public agencies on policy reporting transparency 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 on ongoing basis:** 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 and corruption, including a clear and transparent mandate, procedures, and performance reports.
- **Ensuring climate resilience:** Innovation and industrial strategies also need to be climate-resilient, designed to withstand a changing climate and providing solutions that help society to cope. Ministries of Finance can play a role in this.

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

A major new forthcoming report by University of Oxford's Smith School together with the Swedish Environment Agency is one of the first studies to look at the powerful role of Ministries of Finance in driving, and shaping, the low-carbon transition with an emphasis on innovation. The report:

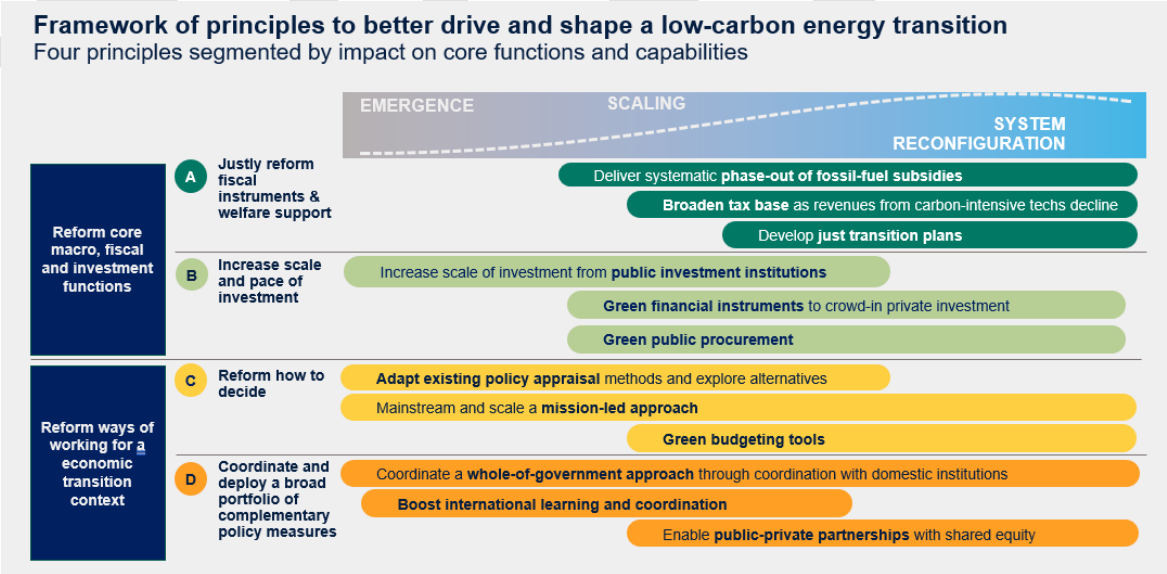
- Reinforces the criticality and relevance of Ministries of Finance in driving innovation.
- Outlines salient risks and opportunities facing Ministries of Finance in late 2022/early 2023.
- Synthesizes a set of recommendations (and subsequent tangible actions) for ways that Ministries of Finance can 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 survival mindset by policy makers 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 clean energy costs, and greater innovation in the use of clean energy in transport, 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 has been estimated to be £9 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 upon 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 B2). These priority principles address key challenges based on discussions with policy practitioners and from leading institutions.

Figure B2: Framework of principles to better drive and shape low-carbon energy transition



Source: Based on forthcoming (January 2023) report from the Smith School of Enterprise & Environment at the University of Oxford and the Swedish Energy Agency

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. While this is covered in further detail in Function 2 below, the use of timebound measures linked to performance benchmarks is often a strong path forward. A lack of technical and institutional capacities to assess the net benefits of targeted fiscal policies in relatively new sectors using novel technologies is another common barrier, covered in Capability 3 below. 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 efficient of climate policies and the 2050 strategy policies.

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.

- **China** has long provided fiscal incentives to R&D and manufacturing in renewable energy, The government also promotes an ambitious electric mobility program. A wide range of subsidies and regulations promote the shift from internal combustion to electric engines, while the government is also encouraging international investors to set up joint-ventures with Chinese carmakers to co-develop modern electric cars. These efforts have turned China into the leading market for the developing, testing and production of electric (Altenburg and Assmann, 2017)
- **Morocco** has been developing a comprehensive strategy aimed at industrialization based on low-carbon, resource-efficient technologies since the mid-2000s. Starting from the desire to diversify the energy mix and reduce the share of imported fossil fuels in 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. However, while the strategy has supported employment creation and domestic manufacturing, insufficient coordination of individual policy measures has hampered a scaling-up of the initiatives and their outcomes (Altenburg and Assmann, 2017).
- **India,** after realizing in the early 2010s that there were no market incentives for developing solar photovoltaics given the lower local costs of coal-fired power plants launched a dedicated photovoltaics program. 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, as well as local content requirements to support the build-up of national manufacturing capabilities as well as a research and development subsidy for government institutions and the private sector. This led to annual growth rates in the solar energy markets of up to 300%. However, while the policy was successful in phasing in solar technologies, it was somewhat less successful in promotion local industrial production (Altenburg and Assmann, 2017).

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

- **Japan's** Green Growth Strategy is part of a national industrial policy and it includes 14 sector-specific action plans as well as 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.
- **Ethiopia**'s Climate Resilient Green Economy Strategy (CRGE), launched in 2011, introduces a sectoral approach to implement policy initiatives to achieve development goals and lower CO_2 emissions by 2025. The mechanism involves identifying key sectors based on the 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 suitability for 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).

A range of case studies 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 which 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 strategies into Ministry of Finance processes.** Structural transformation of key sectors requires a multi-year policy orientation. The fiscal space required to implement green industrial and innovation policies requires the integration into the budget cycle, PFM, and PIM systems (see Function 2).

Shaping investment and transition strategies

This section focuses on how Ministries of Finance can accelerate investment to implement national development and climate plans and strategies. It consists of:

- **Function 1d: Developing investment strategies including by assessing investment needs** for the net zero, climate-resilient transition
- **Function 1e: Identifying and developing bankable projects and programs**

Introduction

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. How these investments are made will determine the success of countries in reaching net zero emissions by mid-century and achieving climate resilience. As outlined in Part A, what is needed is a ramp-up in the quality and quantity of investment in sustainable and resilient infrastructure—both human-built infrastructure (such as energy and public transport), and natural infrastructure (including forest and wetlands) (New Climate Economy, 2018). These will need to be complemented by investments in human and social capital (see just transition section). As above, meeting these investment needs will require an unprecedented scale-up of spending of at least 2% of GDP above pre-pandemic spending in most advanced economies and more in emerging markets and developing countries.

The percentages of capital that will need to come from public, private, and international sources for these investments will vary by country and by investment category (see also Part A). 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 for private investment to materialize, including de-risking throughout the investment cycle (Songwe et al., 2022).

Realizing the necessary investments to implement climate strategies will therefore require active engagement from Ministries of Finance, in cooperation with Ministries of Environment, Ministries of Economy and Industry and other line ministries and the private sector in long-term investment strategy and planning. Many Ministries of Finance are directly in charge of national investment planning and project appraisal (Allen et al., 2015)[12], and particularly the kind of long-lived, capital infrastructure required to meet national climate targets. Even where they are not (solely) responsible—often in countries with a separate economic planning ministry—they still play an important role in realizing investments, not least through their responsibility for overseeing public spending and investment management, and in putting in place the right enabling policies and financial support to encourage private sector investment. In addition, Ministries of Finance are often uniquely placed to integrate different investment ideas, including sectoral and cross-sectoral perspectives, and ensure there is a whole-of-government approach anchored in the sectoral transitions that are needed.

Ministries of Finance will therefore need to play a major role in, among others, supporting the identification of investment needs based on NDCs, LTSs, NAPs, and NDPs and the development of investment strategies and plans; project preparation and identifying tangible project pipelines. Unlocking this investment downstream will then involve feeding investment plants into the budget process and public investment management, as well as identifying relevant policies and financial

[12] 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, 2016).

instruments capable of providing the investment at the speed and scale required (covered under Functions 2 and 3).

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

Context and role of Ministries of Finance

Realizing the investments needed to accelerate the transition towards net zero economies requires long-term investment strategies. 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). While there is a growing understanding of 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 its vulnerability to climate change. Assessing investment needs per sector, based on this information, designing clear mid to long-term strategies with prioritized investments and possible financing splits, is a crucial first step to unlocking the necessary sectoral transformations.

Currently, few governments systematically assess climate-related investment needs across the economy. One study finds that less than half of the G20 countries have integrated both mitigation and adaptation considerations into infrastructure planning, with five mentioning neither adaptation nor mitigation (OECD, 2017b). This is backed up by interviews with Ministries of Finance conducted for this report: 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). Where governments are undertaking assessment of investment needs, they often tend to be ad-hoc and done by sectoral ministries, with limited cross-government coordination and involvement by Ministries of Finance. Insights into necessary investment in training and skills development in line with a just transition is even more limited. 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.)

Ministries of Finance have a clear role in supporting the development of such 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. Clear investment plans can serve as powerful guides and signals of the priority attached to the transition to all levels of government, investors, private sector and the public. Developing such plans will involve the following steps (adapted from the NDC Partnership Investment Planning Guide, forthcoming).

1. **Investment planning capacity**

- **Ensuring clear institutional and governance arrangements, including a designated lead agency coordinating the overall process, is essential for successful investment planning.** Depending on a country's existing institutional arrangements, this can either be an existing ministry or a specialized agency. Yet, in either case, the involvement of Ministries of Finance in relevant processes is crucial, as well as local and regional 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 (NDC Partnership, forthcoming).
- **Enduring stakeholder engagement 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 to do so 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 (NDC Partnership, forthcoming).

- **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. Investment needs identification and prioritization

- **Identifying overall investment needs for net zero and climate resilience, as well as needs across different types of capital, sectors, and technologies**. In each country, the specific investments needed 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.
- **Prioritizing investments, to ensure attention, and finance, is channeled towards the most impactful investments.** Prioritization can happen at sector, program or project level. Prioritization can signal relative urgency, as well as ensuring that climate investments are aligned with other national investment priorities. For instance, Kitts and Nevis, in its NDC Implementation Plan, has prioritized a range of projects across two sectors (see below).

3. Investment mobilization

- **Identifying barriers to investment,** as well as possible ways to overcome them (discussed below).
- **Exploring possible public, private and international financing splits** that can then inform public investment management processes (see Function F2d) and financing strategies (see Function 3).
- **Setting up project preparation processes and project pipelines** and ensuring an enabling investment environment. (This is discussed in more detail in Function F2b.)

While developing such plans, Ministries of Finance should pay attention to a range of important considerations including:

- **Giving equal consideration to the operation and maintenance (O&M) costs of infrastructure alongside capital expenditure.** Infrastructure projects require more than an one-off capital injection. Yet investment needs assessments often focus on capital spending, while struggling to assess operational and maintenance spending, which are rarely considered when making strategic investment planning decisions. However, depending on the type of infrastructure, O&M can be a significant cost factor (Hallegatte et al., 2019). For instance, in water and sanitation it usually accounts for more than half of financing needs. Meanwhile, different solutions to the same infrastructure problem can have vastly different maintenance costs (e.g. bus vs light rail) (ibid.). At the same time, good maintenance can also 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 not only take into account the cost of the initial investment, but the total cost, ensuring sufficient allocation of resources for O&M throughout the lifetime of project.
- **Using investment plans to consider the socioeconomic consequences of the proposed investments.** The transition to a low-carbon economy will inevitably require massive growth in some, low-carbon, industries, while others, particularly those related to fossil fuel production, will decline, with consequences for skill requirements, (un)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).
- **Using investment plans as an opportunity to provide clarity to investors about the country's preferred technology pathways** such as to what extent and how a country is planning on using hydrogen to decarbonize the transport sector. To ensure alignment on priorities and avoid stranded assets, transparent communication of such technological choices is key (OECD, 2017b).

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 not adequately considered in the planning process, including (NDC Partnership, forthcoming):

- **Economic and financial barriers**, including the failure to internalize 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 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 on 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.

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 result make it more difficult to attract private capital for adaptation projects. (Climate & Development Knowledge Network (2013) provides an overview of barriers and which ones commonly apply to mitigation and/or adaptation projects.

In addition, the investment planning process itself can be complicated by a range of factors, particularly:

- **A lack of clear climate plan and targets on which to base assessment needs:** Many climate strategies lack details on the specific sectoral targets and outcomes, including the type and amount of investments that are 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 early in their development. This is complicated by a lack of tools to make both informed investment needs assessment and investment decisions, meaning that investment planning has to be performed under high levels of uncertainty.

There are a range of steps Ministries of Finance can take to tackle these barriers, including:

- **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 (2022) 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 and enabling environment for investment planning.

- **Ensuring strong climate strategies:** Through strong involvement in the climate strategies, Ministries of Finance can ensure that NDCs, in addition to high level adaptation and mitigation targets, contain sectoral targets, details on the outcomes needed to achieve targets, as well as solid Key Performance Indicators (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, 2022).

- **Investing in investing:** Ministries of Finance should consider 'investing in investing', i.e., in the data, analytics and technical knowledge needed to make informed investment needs assessment and investment decisions. This will also include the design of appropriate project and policy appraisal tools, as well as investing in the necessary expertise on the nature of the transition required across the economy 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. Any of these factors can change over time, which 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 so far, but also feedback from stakeholders and lessons learnt during the initial phases of the process (NDC Partnership, 2022).

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 over the next year and will be particularly helpful for providing more granular data on adaptation and resilience financing needs.

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.

- **Rwanda**, in a process 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. It was estimated that the total investment needed to achieve NDC adaptation interventions 2030 goals is US$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. Moreover, a specialized green fund called FONERWA was created in order 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. As part of the plan, it systematically identified sector-specific barriers to the necessary investments needed for the implementation of the NDC. These 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: (a) high upfront costs even where maintenance costs are lower, (b) lack of charging infrastructure, (c) lack of public awareness of the technologies and its benefit, and (d) a lack of

appropriate electrical vehicle model types on the local market. Solutions to these barriers included an electrical vehicle 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 more spaces for charging stations, and exploring public–private partnerships to set up charging infrastructure (NDC Partnership, forthcoming).

- **Spain**'s National Energy and Climate Plan (NECP) includes a list of measures to decarbonize the economy across sectors covering energy, transportation, industry, buildings, agriculture and waste. The NECP is a plan mandated by the European Union to each of its member states in order for the EU to meet its NDC. This is complemented by an investment needs assessment provided in the NECP with the total investment of €236.1 billion needed until 2030. The majority of investments are needed for energy savings and renewables followed by networks and the electrification of the economy and other, 80% of which are 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 development of the NECP (Coalition of Finance Ministers for Climate Action, 2020a).

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

However, evidence of coordinated long-term investment planning for the transition beyond 2030 is limited and the majority of LTSs lacking the granular information to inform investment planning. Some countries have advanced work in this area, but they generally fall short of providing the foundation to redirect investments at the scale needed.

- **Cambodia** assessed the investment need for the LT-LEDS and estimates that the public financing need for the LT-LEDS will amount to almost US$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 remaining requirements.
- **Costa Rica's** National Decarbonization Plan sets out the country's 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 of these priorities 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. 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 as well as barriers to investment and how they can be removed (Interview for this report).

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

[to be added]

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, including 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 allow for 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 decision.

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 towards 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 can be described as the process of "translating investment needs into specific investment projects that are ready for financing and implementation" (NDC Partnership, forthcoming). A key part of project preparation is the development of low-carbon, climate aligned project pipelines, defined 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).

The purpose of identifying project pipelines is threefold: They can help to 1) promote investment in 'suitable' projects across priority sectors; 2) accommodate the requirements of investors; and 3) allocate project preparation support to projects that are not yet bankable (ibid.).

Governments should give far greater attention than is usually the case to translating their investment planning decisions into concrete programs and pipelines of projects. 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" (OECD, 2018a). Consequently, it is not always clear what projects are needed, where and when, how they will be financed, and if they are aligned with long-term objectives, making it difficult to match investment needs and investors. While this step is often done last in the process of developing investment strategies, with greater attention given to identifying key policies and financial instruments capable of unlocking investment at scale, 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 report. 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 they are taking. 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). Indeed, the definition of bankability 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 make rapid progress. Priority projects will differ in each country but are likely to heavily feature power generation and electrification, as well as adaptation, particularly in climate-vulnerable countries (see Part A). Prioritization requires a clear short list of prioritized projects, and an open participatory, multi-criteria and transparent prioritization mechanism, as well as dedicated project preparation support facilities to ensure that prioritized projects can be implemented (see below). For instance, the **European Union** has a system in place to fast-track the development of strategically important projects on low-carbon technologies and network infrastructure within the bloc (OECD, 2018).

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 with 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 bring 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. This includes:

- **Identifying fiscal and financial policies that support the investment strategy and creating the fiscal space to implement it.** This includes the implementation of policies that provide clear signals to accelerate the drive to net zero emissions, and can include carbon pricing, fossil fuel subsidy reform, and reforms to public procurement (see Function 2). And it 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, and 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, 2017). The renewable 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 both 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 support 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 hinder countries' ability to reach climate targets (OECD, 2018). Climate-proofing existing project pipelines will therefore be important.
- **Lack of tools to prioritize climate projects** (see also F2c).
- **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—due to the varying nature of pipelines between countries, and lack of clarity in pipeline development (OECD, 2017a)
- **Cost of project preparation**: The cost of project preparation can be substantial, and hence ensuring the bankability of projects is a significant task. Estimates suggest that they make up typically 3–5% of total investment costs in developed, and up to 10% in developing countries (GI Hub, 2019).
- **Difficulty of institutional reform:** Implementing or reforming the institutions required for a good investment environment does not happen overnight and is a process fraught with many challenges.

Recognizing the many challenges and the importance of project preparation, some countries, MDBs and other development partners have set up Project Preparation Facilities (PPFs), as well as 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 improve overall bankability of projects. Examples of PPFs in developing countries focused on climate include the Green Climate Fund Project Preparation Facility that assists developing countries that are part of the UNFCCC, and Cities and Climate Change in Africa (CiCLIA) managed by the Agence Française de Développement. The NDC Pipeline Accelerator assists national and sub-national entities, both public and private, in Latin America, 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 private-public Partnerships, 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 with 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 towards project preparation, while at the same time ensuring efficacy, including by tracking expenditure and outcomes (GI Hub, 2019).

The IMF's Climate Public Investment Management Assessment (PIMA) framework, which now also 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.

- **Kiribati's** NDC Investment Plan includes a project pipeline which consists of 15 'primary mitigation opportunities'—projects worth an estimated US$210.5 million—in two priority sectors: transport and energy.
- **São Tomé and Príncipe** 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, forthcoming).

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

- **Indonesia** established the Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) in 2014. An inter-ministerial body which 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 further 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 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 energy, the UK took a series of 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 energy unit, 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, 2018).

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 in order 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:

- 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 and the budget process

[Helsinki Principles 3 and 4]

This section 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:

Reforming tax systems and macroeconomic incentives

- **Function 2a: Transforming economic incentives through carbon pricing, subsidy reform and other fiscal policy measures**. This includes:
  - Setting **macroeconomic incentives**, including carbon taxes and pricing, phasing out fossil fuel subsidies, and new forms of environmental taxation (known as 'getting the price right').
  - Setting **fiscal incentives and regulations** for transforming key sectors (known as 'pricing plus').
  - The importance of combining policy measures – including price and non-price instruments – to create **smart policy packages** to drive transformation and address multiple market and non-market failures.
- **Function 2b: Future-proofing the public finances by redesigning the tax system for net zero and climate resilience.** This includes:
  - Identifying **alternative revenue streams** to taxing fossil fuels.
  - Managing **cascading contingent liabilities**, known and unknown.

Mainstreaming climate in the budget

- **Function 2c: Using the budget to drive transformation across economy by** mainstreaming climate action with medium term expenditure frameworks and annual budgets.
- **Function 2d: Greening public investment management.**
- **Function 2e:** Using **public procurement** to drive climate action.

Introduction

Climate action requires structural transformation of the economy in all key systems and sectors, supported by addressing the wide-ranging market and non-market failures that are holding back action. These include the impacts of emissions, knowledge spillovers, infrastructure lock-in, network externalities, co-benefits, split incentives, information costs, and coordination problems (Stern, 2022a).

These imply a critical and wide-ranging role for macro and fiscal policy 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. The presence of these barriers also means there are no 'silver bullets' to climate policy. Policies such as carbon pricing or subsidy reform are necessary but not sufficient alone to meet climate goals.

The core fiscal policy and budget levers are outlined in further detail below.

Reforming tax systems and macroeconomic incentives

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

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

Context and role of Ministries of Finance

Establishing carbon taxation or pricing and reforming fossil fuel subsidies are central pillars of climate policy, requiring active involvement by Ministries of Finance. Both instruments have the potential to transform economy-wide incentives to deliver on national climate objectives while raising or saving significant government revenues. Neither are 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 given individual and local circumstances.

Carbon pricing schemes typically take two forms: a carbon tax or an emissions trading scheme. The most efficient and easiest to administer through existing excise taxes is a carbon tax, which is a charge on the carbon content of fossil fuels. The alternative, an emission trading scheme (ETS), typically 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 depending on 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 amount 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 uncertainties can be mitigated with a well-designed system. It is possible to have both an ETS and carbon taxes if the domestic or regional market is large enough, as in the EU. The IMF have recently usefully summarized the different characteristics of carbon taxes vis-à-vis emissions trading schemes (see Table 3 in IMF, 2022).

Ministries of Finance can be reassured that the macroeconomic effects of introducing both systems of carbon pricing tend to 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 evidence from high- and middle-income countries suggests competitiveness concerns tend to not materialize and the overall effect on economic activity can be positive, albeit with prices typically at modest levels. 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 lower levels of air pollution, reduced congestion, fewer traffic accidents, and smaller road damages and these welfare benefits can offset any potential dampening effects on economic activity (ibid).

Subsidy reform is equally important 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 US$584 billion annually in 2017–2019 through direct budgetary transfers and tax expenditure, price support, public finance, and investment by state-owned enterprises (SOEs) for the production and consumption of fossil fuels at home and abroad. Governments provided more support to oil and gas production than any other fossil fuel-related activity, at US$277 billion (IISD and ODI, 2020). In 2020, LAC countries provided US$60 billion in fossil fuel subsidies, approximately 1.3% of their GDP (Parry et al., 2021). Some estimates suggest globally, subsidies could be as high as nearly $6 trillion or around

7% of global GDP when including environmental costs and foregone consumption taxes (ibid). There are currently few signs of a there being a marked drop in these levels over time, with additional funding committed in the COVID-19 period and since the current energy crisis in natural gas markets (O'Callaghan et al., 2022).

Eliminating fossil fuel subsidies has the potential to save significant government revenues. Revenues 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 US$2.8 trillion in government revenues in 2030, more than the GDP of India today (New Climate Economy, 2018). Similarly, Parry et al (2021), building on Coady et al. (2019) , find that subsidy reforms could generate global annual carbon emission reductions of up to 36% and increase government revenues by about 3.8% of GDP, preventing nearly a million local air pollution deaths. Estimates by the US Treasury suggest phasing out fossil fuel subsidies in the US could save around US$35 billion to 2031 (U.S. Department of Treasury, 2021).

Barriers to action and ways to overcome them

Despite carbon pricing's co-benefits and relatively mild macroeconomic effects, there have been some challenges in ensuring take off in most countries due, in large part, to acceptability and design challenges. 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 US$50–100 per tonne price needed by 2030 for a 2°C warming scenario (Bhattacharya et al., 2021; Stiglitz and Stern, 2017). Only five countries in Europe —Sweden, Norway, Liechtenstein, Switzerland and France — are in the target pricing range and many of these schemes are undermined by exemptions. In LAC, only five countries have a carbon tax, and these generally have low prices and design deficiencies (IDB, forthcoming). A new survey of 71 countries by the OECD (2022d) shows that although coverage and levels of net carbon prices - including energy taxes and subtracting fossil fuel subsidies - have improved in 47 countries between 2018-2021, prices are zero or negative for almost 60% of GHG emissions and where positive, are rarely high enough to drive a successful transition to net-zero. One of the exceptions is Uruguay which has the highest CO_2 tax in the world (at around US$135 per tonne) covering around 10% of the country's emissions in 2019. This is why, to ratchet up near-term action, the IMF has recently suggested a global carbon floor price of at least US$25–75 per ton of carbon depending on the economic development stage of the country (IMF, 2021b). Other studies suggest this should be higher.

The overall challenge for Ministries of Finance is that, to be effective, carbon taxation or pricing has to be designed and communicated well to highlight the long-term benefits of climate action for the environment, public health, and the economy and carefully consider how to address the short-term costs in the form of raised energy bills. When not designed well, the combination of clear, concentrated costs and opaque, diffuse benefits can be politically challenging, and it results in several barriers to introducing carbon pricing. These include:

- Broad public opposition due to households being worried about spending too much of their income on energy, which is especially important for the poorest households.
- Businesses worried about competitiveness.
- Households and businesses worried about inflation.
- Coordinated opposition by fossil fuel companies and a narrow range of vested interests.

These issues are especially pertinent in the context of the current global cost of living crisis. And some concerns are especially pertinent for low-income countries where higher energy costs can have major implications for energy access (tempered by the widespread use of fuelwood).

Ministries of Finance should also be conscious that carbon pricing often needs to be complemented with other measures, including to enhance its effectiveness. Carbon pricing on its own—especially at modest levels—is not likely to reduce emissions at the pace and scale required due to 'demand

inelasticity' (Heal and Schlenker, 2019). In simple terms: businesses do not rapidly innovate because of relatively modest changes at the margin in the price of energy without the emergence of strong low-carbon alternatives.[13] A recent meta-review of 37 ex-post evaluations of carbon pricing policies around the world since 1990 show that schemes usually deliver cuts in the range of 5–15% cumulatively in their first decade or so (typically between 0.5-2% per annum) with some schemes delivering slightly more and some slightly less than this (Green, 2021). Amongst schemes with higher prices, there was a diverse range of impacts on emissions from modest impacts to more significant outcome. Similarly, a recent review of around 20 studies by the Carbon Pricing Leadership Alliance, hosted by the World Bank, suggests carbon pricing reduced emissions growth rates by around 1.5-2.5% per annum (Carbon Pricing Leadership Alliance, 2022). These assessments could underestimate the potential impact of carbon pricing as many, but not all, of the schemes assessed had relatively low coverage, prices, or timeframes. Complimentary projections by the IMF using multi-decade price elasticities of demand suggest that comprehensive carbon pricing arrangements might have more significant impacts (See IMF, 2019). With a carbon price of $70 per tonne, this could be close to a 35% reduction in emissions versus business-as-usual by 2030 across the G20 average. The potential for carbon pricing to generate significant impacts is therefore important.

Nevertheless, these figures compare with the need for far more significant global annual cuts of almost 8% a year to put us on track for a net-zero economy by mid-century. Part of the reason that carbon pricing needs to be complemented by other measures is because of the limited impact of carbon pricing - even in the presence of higher prices - in driving investment and innovation (Lilliestam et al., 2021). Instead, it tends to promote optimization of established business models and technologies through fuel switching and enhanced energy efficiency rather than the more fundamental system change needed for deep decarbonization (Rosenbloom, 2020). This is why the IPCC concluded that 'carbon pricing is effective in promoting implementation of low-cost emissions reductions (high confidence). Yet 'carbon pricing 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).

For these reasons and others, the IMF and other prominent institutions and individuals recommend (e.g. Black et al., 2021; IMF 2019a; OECD, 2022d):

- Complementing carbon pricing with other instruments such as regulatory reform, major investment in the clean energy and mobility transition, and R&D to drive innovation. This is to help tackle complementary market failures to the greenhouse gas externality. See Box B3 below.
- Giving equal attention to the phase-out of fossil-fuel subsidies which are typically costly for the national fiscus, regressive, and widely acknowledged to be economically inefficient.
- Ensuring that carbon pricing systems are well designed to make the reform socially just, politically acceptable, and inclusive.
- Considering the greater use of targeted income support for vulnerable groups during periods of high and volatile global energy prices rather than untargeted price support.
- Encouraging groups of countries to work together to introduce carbon floor prices and border carbon adjustments to alleviate competitiveness concerns (a recent Coalition for Finance Ministers report by HP3 explores these options in further detail).

To unlock new investment and enhance the responsiveness of economic actors to carbon pricing (and to potentially trigger non-linear responses), it is also especially important that governments commit

[13] This is not surprising given that if the United States implemented a $50 per tonne carbon price, gasoline prices would increase by $0.44 per gallon, sufficient to raise monthly driving costs by $25 a month and induce driving a bit less at the margin, but insufficient to make people give up their cars without strong alternatives. However, these price impacts are likely to be more significant in other sectors such as energy. The effects of the current energy price spikes are far more significant in their price effects than carbon pricing (some estimates suggest the current energy price rises equate to roughly $350 per tonne, yet even here, there is little evidence of change in habits).

to a long term, predictable pathway for prices. Indeed, some countries such as Canada and Ireland have been willing to commit to high future carbon prices.

Similarly, there are significant challenges to subsidy reform which can be overcome. When not designed well, in some cases, reforms can lead to major public protests, strikes and even government instability. Experience has shown that there are ways to address these political challenges: robust and well-communicated reform processes, clear information on the costs and impacts, credible and staggered time frames, targeted support to low-income households, and delivering on other social priorities (such as schools, hospitals, public transport). The IDB has estimated that less than 30% of the savings generated by subsidy elimination needs to be redistributed to vulnerable groups in order to be effective (Vogt-Schilb et al., 2019).

The ingredients for overcoming these barriers include (Bhattacharya et al., 2021; IMF, 2019a; New Climate Economy, 2018):

- **Inclusive decision-making.** Extensive consultations with all stakeholders about their concerns, the reform's objectives, and expected outcomes.
- **Scheduling and communicating tax increases well in advance.** Starting with lower taxes for those more exposed to international competition and on products consumed by the poor.
- **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.
- **Considering how to make 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 sector-specific pricing policies as well as non-price policies (see further below).

Real world examples

Introducing carbon pricing and subsidy reform can be challenging but many countries have succeeded. Many countries and jurisdictions, starting with Finland in 1990, have been able to introduce and maintain a carbon tax, including **Argentina, Colombia and Chile**. Globally, 68 carbon pricing initiatives have been implemented, covering 11.83 $GtCO_2e$ and representing 23.11% of global greenhouse gas emissions (World Bank, 2021a). Many of these examples are well documented elsewhere, including the EU's flagship Emissions Trading System. One of the most studied cases is the carbon tax adopted in 2008 in British Columbia (Canada). Since 2019, carbon pricing has applied in all **Canadian** sub-national jurisdictions, through either a provincial or territorial carbon pricing system, or the federal backstop system. Canada's federal carbon pollution pricing system has two parts: 1) a regulatory charge on fossil fuels ("fuel charge") and an output-based pricing system (a regulatory trading system for industrial emitters) (Government of Canada, 2022).

Ministries of Finance should be cognizant that a recent review of available studies on the impact of relatively high carbon prices in the European Union, New Zealand, British Columbia, and the Nordic countries finds that they do not yet do enough to promote innovation and the use of the technologies required for net zero emissions (Lilliestam et al., 2021). As above, this reinforces the argument for complementing pricing with other measures to catalyze low-carbon alternatives, including to enhance the responsiveness of the economy to carbon pricing. It is also important for Ministries of Finance to

recognize that carbon taxes are not new, and many countries have existing energy and fuel taxes which can amount to substantive (implicit) carbon prices for particular fuels (IMF, 2019a).[14]

Many countries have been able to introduce and sustain subsidy reforms, although progress may prove challenging in the short term given the current energy crisis. Indonesia raised gasoline and diesel prices by 33% in 2013 and another 34% in 2014, saving Rp211 trillion (US$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 LPG (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). These are well documented elsewhere (see, for example, NCE 2018).

Box B3. Why Ministries of Finance need to 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 a wide range of market failures and other barriers to the transition to a low-carbon economy. 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 a broader range of market and non-market barriers to the required transition to a low-carbon economy:

- **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 transport for vehicle owners to switch to.
- **Low responsiveness to carbon prices** in some sectors due to low share of energy costs in total costs, inelastic demand, or non-price barriers, e.g., lack of public transport choices, and the time cost of commuting inhibits responsiveness to fuel taxes.
- **Network externalities**: where the benefits to an individual depend on how many others are using the product or service, e.g., expansion of EV use may depend on the availability of EV charging infrastructure, which in turn depends on the number of EV vehicles 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 underprovision or undersupply of capital.
- **Equity impacts:** low-emissions policies can impact on the welfare of individuals, groups or regions and accompanying policies to address this will often be warranted.
- **Co-benefits:** externalities from low-emissions policies, e.g., reducing fossil fuel use, results in less air pollution and health benefits in addition to cuts in greenhouse gas emissions.
- **Split incentives:** where the returns to a socially efficient mitigation investment (e.g., by a landlord in building energy efficiency) accrue to another party (the tenant), inhibiting investment.
- **Information costs and gaps:** businesses and consumers may lack sufficient information on energy efficiency and/or may be short-sighted in their decision-making.
- **Financing constraints:** inability to borrow may constrain investments in low emissions technologies where their upfront costs are higher, but recurrent expenditures are typically lower.
- **The size and speed of the required transformations:** reliance on price instruments may not create sufficient certainty or speed of change (Stern, Stiglitz, et al., 2021).
- **Coordination**: the fundamental economic transformations required necessitate coordinating the actions of all decision-makers across the public, private, and household sectors.
- **Inability of government to commit to future policies**: private investment can be inhibited by uncertainty about the future path of carbon prices given the inability of government to commit future governments.

[14] For example, averaged globally, road fuel taxes of around US$1 per liter represent a price of US$380 per tonne of CO2 emissions from these fuels (IMF, 2019a).

- **Capital stock turn-over:** the capital stock turns over at different rates in sectors, so a uniform carbon price may not provide strong enough incentives to decarbonize at rates required for net-zero (Vogt-Schilb et al., 2018).[15]

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)

Creating fiscal incentives and regulations for transforming key sectors

Context and role of Ministries of Finance

Carbon pricing and subsidy reform needs to be supplemented with other fiscal incentives and regulatory measures to transform key economic systems and sectors of the economy (see Box B3 above)**.** Many sectors relevant to the transition face a range of market and non-market barriers to be overcome. In transport this includes the need to tackle network externalities around electric vehicle (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 on new technologies. Often long-term market signals are needed to provide a stable environment for private investors.

Key sectors for investment include:

- **Electricity generation** from renewable energy sources (wind and solar), storage and network development (including grids).
- **Energy efficiency of buildings** through retrofits and new zero carbon buildings.
- **Industry,** including energy efficiency and decarbonization of industrial processes.
- **Transport,** including scaling up charging infrastructure for electric vehicles, shifting to sustainable aviation, and scaling up green shipping fuels and zero-emissions vessels.
- **Protecting and restoring natural capital,** including through sustainable agriculture and land use practices, and conservation of biodiversity.
- **Adaptation and resilience,** including making infrastructure, both physical and natural, more resilient to a changing climate.
- **Accelerated innovation** in 'hard to abate' sectors such as steel, cement, and air and sea transport, to include hydrogen and carbon capture, utilization and storage (CCUS).

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 which 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 to the current market regime. In the rapid growth and consolidation phases, public support can be phased out. The role of strong public sector incentives for solar photovoltaic in the early stages of growth in **Germany** and **China** are well documented examples (Altenburg and

[15] For example, while retrofitting may be expensive, there are physical limits on the number of buildings that can be retrofitted—delaying retrofits decades into the future may be too late for a net zero pathway. Hence, starting with the most expensive abatement opportunities first may make sense in such cases, and hence reinforcing polices are needed. See Vogt-Schilb et al (2018).

Assmann, 2017). If designed well, they can help to make carbon pricing schemes more effective and efficient (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 or ownership fees; lower taxation of fuel costs (e.g. lower taxation of electricity vs 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.
- Grants and performance-based incentives to provide a direct cash incentive which do not require repayment (e.g., for building retrofit).
- Indirect or non-monetary incentives (e.g., exclusive access to parking spaces or lanes for EVs or e-buses).

Over time, 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 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 ten types of decarbonization instruments including several of those above), but detailed assessment is beyond the scope of this document.

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 engines. 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, 2022a).

Barriers to action and ways to overcome them

There are a wide range of barriers that typically have to be overcome to design effective fiscal incentives such as the fear of unsustainable, unending fiscal commitments to a sector and ineffectively matching incentives to overcoming the barriers in question. This will require Ministries of Finance to work with relevant line ministries to put in place the basic ingredients for success. Lessons for successful schemes include (see Bonzi Teixeira et al., 2022; CESC, 2016).

- **Basing 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.
- **Establishing 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 is reached with alternatives.
- **Engaging 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.

- **Helping line ministries introduce complementary regulations.** Strong regulatory standards provide a critical foundation for 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.
- **Expanding 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.
- **Monitoring and evaluating benefits and costs and improving financial incentives over time.**
- **Considering inclusion of non-taxable entities** in tax incentives to engage low-income individuals.

Real world examples

The example of renewable energy in **Uruguay** demonstrates how Ministries of Finance can play a powerful leadership role in driving sector transformations using a combination of fiscal incentives. Uruguay has become one of the only countries in the world to rely on renewable energy for almost all electricity generation and close to 60% renewable energy in the total energy mix (Ministry of Industry Energy and Mining, 2020). This has delivered a wide range of economic, social, and environmental benefits. It has also contributed to energy security and macro stability in the face of today's global energy price spikes. See Box B4 for further detail. There are many other pertinent examples. In the **UK,** for example, 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 yet unclear. To address the high cost of investments in green building renovations, the **German** 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, proposed 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 tonnes of CO_2 by 2030 (IEA, 2021a)

In September 2022, the Ministry of Finance in **Ethiopia** introduced a new tax reform which encourages EV investment and imports as well as local vehicle assembly (Bloomberg Tax, 2022). According to the new law, VAT, excise, and surtaxes will not be applied to electric vehicles. Moreover, the duty tariff for EVs will be reduced to 15% while those vehicles that are assembled locally in Ethiopia 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.

Exemptions on excise duty on electric cars in **Iceland** gave a sizeable VAT rebate which led to an increase in EV uptake. This placed the country as one of the three leaders in EV shares globally. After successfully increasing the share of EVs, in 2022 the government is proposing to apply a minimum tax on all cars, including EVs, as well as new road tolls (Iceland Review, 2022).

Box B4. Role of Ministry of Finance in driving Uruguay's renewable energy transformation, energy security, and protecting against inflation

Between 2017-2021, nearly 95% of Uruguay's electricity generation originated from renewable sources. This is a significant change from just over 10 years prior, 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 US$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. This strategic approach has bolstered its balance of payments and placed Uruguay 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.** Prior to 2008, there were no large-scale wind energy farms in Uruguay. Currently, wind farms in operation have an installed capacity of 1,506 MW.
- **Solar.** The use of solar energy conversion technology has undergone significant development. To date, there are 19 large-scale photovoltaic plants feeding their energy into the electric grid, 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, with existing bioenergy plants in the country represents 9% of installed capacity (425 MW).

The rapid expansion of renewables in Uruguay has been attributed to:

1) **Long-term policy:** Uruguay has a long-term energy plan, the National Energy Policy 2005–2030, which was approved in 200. An important feature of the policy is its commitment to the diversification of Uruguay's energy sources and the incorporation of renewables in the energy mix. This established a solid institutional and a regulatory framework that proved attractive to investors. It had multiple goals: energy independence, mainly to delink the national budget from the variations of the international price of oil, promote the national energy industry and mitigate the emission of greenhouse gasses.
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 Law for the Promotion and Protection Investment such as treating wind power generation projects destined for the national system as intangible assets. The solar thermal energy promotion law provides tax exemptions 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.

The incorporation of non-traditional renewable sources (wind, biomass, solar) reduces climate vulnerability and cost overruns in dry years with low availability of hydroelectric power, while reducing emissions.

Source: Prepared by the Uruguay Ministry of Finance

Combining instruments into smart policy packages to drive transformation[16]

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 can reduce the carbon tax rate required to achieve a given mitigation goal, for example. On the other hand, an ETS in the continued presence of fossil fuel subsidies will work against those subsidies. And fiscal incentives to encourage use of a 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. However, in sectors that exhibit numerous market and government failures, such as transport, 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.

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 is one: the strategy sets out a clear framework

[16] This section draws heavily on a contribution from Murray Petrie (Expert advisory group).

that contains macroeconomic and fiscal policies, public financial management, and financial regulation, as well as work required with other stakeholders, such as sector ministries, the central bank, and supervisors (IDB 2021, p. 89). In the case of **Sweden**, there has been a focus on increasing the production of CO_2-free electricity using hydropower, nuclear power, solar power, and wind power combined with a carbon tax, and other environmental taxes such as energy tax, aviation tax and vehicle taxes. All act as significant revenue-generating fiscal instruments (Jonsson et al., 2020).

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 contributing an estimated 5% of GDP and a main source of hard currency. 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.

Box B5. Country examples of 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 a mandatory energy performance certificates for buildings. The elements were designed to complement and mutually strengthen each other and were 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; research and development 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 (Never and Kemp 2017).

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 ton 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 the 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 which are socially just, politically acceptable, and inclusive. Both measures should be reinforced with other complementary measures to enhance their impact.

Alongside explicit carbon pricing, Ministries of Finance should 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 depleting reservoirs and aquifers.
- Taxing plastic bag use.

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, transport, and buildings. Ministries of Finance should:

- Carefully consider relevant fiscal incentive instruments based on their ease of distribution and collection, linkage with externalities and other market failures, and social progressivity.
- Consider an appropriate incentive timeframe to support sustained investment which 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 engines.

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 which can undermine collective impact.

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

Identifying alternative revenue streams to taxing fossil fuels

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 towards a net zero economy is already having a significant impact on the tax revenues and could continue to do so, and Ministries of Finance need to be prepared to identify

alternative sources (IMF/OECD, 2021). Tax revenues could be impacted, especially in the medium to long run, through two main direct channels:

- The impacts of declining tax revenue from fossil-fuel production as climate policy and the impact of new renewable energy technologies bite. 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.
- The impacts of declining tax revenue from taxation of fossil fuel consumption as electrification ramps up, especially of EVs. This is particularly pertinent to tax revenues from road transport (given that most fossil fuel energy uses are either untaxed or taxed at low rates). Common forms include fuel duty, vehicle excise duties, and air passenger duty.

In some countries, tax revenues from fossil-fuel production can account for over 50% of government revenues in some countries (GGSD, 2019) They often help to capitalize sovereign wealth funds (SWFs). In many other countries, fossil fuels still contribute substantially to tax revenues. The US generates US$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 (GGSD, 2019) albeit large importers of fossil fuel are often vulnerable to balance of payment issues. In many countries this tax base is already eroding due to energy efficiency in the transportation sector. This is likely to be exacerbated as certain forms of revenue trend towards 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).

Moreover, Ministries of Finance should be cognizant that new forms of carbon taxation 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). These 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 taxation or 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.

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 take 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 renewable 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 renewable 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 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 fuels revenues are not typically the ones where clean energy technologies are deployed. In Montana, US, local governments received US$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. They 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 excise on alcohol and tobacco or general forms of taxation (income tax and VAT)
- Identifying new revenue sources (financial transactions, wealth, digital services)

(see IMF and OECD, 2021; Coalition of Finance Ministers for Climate Action, 2022d; Floater et al., 2017; 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. Costa Rica has 95–98% of its electric energy coming 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 introduced a 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.[6]

More than 95% of **Uruguay's** electricity generation in 2021 came from renewable sources, and 57% of energy use was renewable in 2021 which is a rapid increase from only 37% in 2005 (NDC Partnership

(see box B2). In **Nicaragua**, only 25% of electricity was generated from renewable sources in 2007, but as of 2020, the annual average 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. 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 transport (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 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 leveraging 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 (ETC) as possible substitutes for the fuel tax to make up for lost tax revenue (The 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 allow EVs to contribute to investments into better road infrastructure (The Eastern Transportation Coalition, 2022b).
- **Registration fees**. California, for example, introduced vehicle registration fees in 2020 to address decreases in petrol tax revenue, charging zero-emission vehicles a registration fee up to US$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 2018 that taxes cars based on their level of CO_2 generated. This has had some positive impacts in terms of sales of EVs and value of used cars (ibid.).

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 t 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 expenditures and structural development funding to support impacted regions.

Climate risks related to acute events such as 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.

As is well documented elsewhere, these risks are transmitted through five main channels:

- 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 and implicit, known and 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 full 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 deteriorating 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 actions to mitigate emissions and advance adaptation (limiting climate physical risk), and actions to drive a smooth economic transition (limiting climate transition risk). Moreover, macroeconomic modeling analyses 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 climate-related risk enhanced IMF Article 4 consultations.

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 and/or exploitation, transportation and oil, gas and coal processing. One of the main risks from stranded assets is the fall in public revenues from extractive sector activities (such as royalties) and gasoline taxes. If the Paris Agreement targets are met, between 66% and 81% of Latin America and the Caribbean's oil reserves would not be exploited by 2035 and tax revenues would decrease by between US$1.3 and 2.6 trillion (Solano-Rodriguez et al., 2019). for example. 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 (before the end of their useful life) of coal-fired power plants in line with the country's long-term goal of decarbonization and interest in potential electricity generation with renewable sources (Presidency of Chile, 2019). The first plant was closed in 2022.

Source: Adapted from Eguino and Delgado, forthcoming)

Barriers to action and how 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 to first identify and then craft strategies to tackle these risks. Ministries of Finance 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 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 its 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.

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 or 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 2(1)(c) of the Paris Agreement which requires states to work towards 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 to government procurement processes and 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)*. To date 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')*.
- They 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*; see again *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 Australia, 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. As a recent report by the Network for Greening the Financial System puts it, "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 as well as guidance on the management of climate risks and impacts by both the public and private sector.
- 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)

Opportunities for action

Ministries of Finance should review and, if necessary, redesign their overall tax revenue system 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 on 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 transport.
- Consider investing in the technology for a large uptake of distance-based 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. Ministries of Finance 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 3).
- Including contingent liabilities from physical and transition risks in the fiscal planning and budget process.
- 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.

Mainstreaming climate in the budget

Function 2c. Using the budget to drive transformation in all sectors of the economy

Mainstreaming climate action within medium-term expenditure frameworks and annual budgets[17]

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 and investment. 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. In a review of US$18 trillion in recent COVID-19 rescue and recovery packages, only 5% was green, totaling less than US$1 trillion (O'Callaghan et al., 2022). Accelerating climate action will thus require increasing or redirecting the allocation of public sector resources towards 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 (e.g., education, health, security) outcomes.

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

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, as well as 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 and budget forecasts (MTFFs) and multi-annual budgets (Medium Term Budget Frameworks).[18] It also requires working closely in partnership with the main spending line ministries.

This agenda has been assisted during the last five years by the use of so-called 'green budgeting' approaches, defined by the OECD 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. **Canada**'s Strategic Environment Assessment for all policy and program proposals represents an important example of an elaborate scheme to account for sustainability and environmental effects of activities by the public sector. Canada has created guidelines to instruct federal departments and agencies 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).

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 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.

Table D2 in the annex highlights in detail the key entry points for mainstreaming climate action within the typical budget process based on expert input. It includes examples of key 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 to do so including in the Budget Framework Paper, updates to the Medium Term Fiscal Framework (MTFF) and Medium Term Budget Framework (MTBF), 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

[18] 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.

priorities, including 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. Ministry 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 (BFP) 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.[19] This forms the basis for the next detailed stage of the budget preparation process.

The budget preparation phase usually involves line ministries preparing detailed budgets for submission and approval by the legislature. Ministries of Finance should work closely with them to provide 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.[20]

The Ministry of Finance will then play a critical budget challenge function once the detailed line ministry submissions are submitted. The aim is 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).

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

[20] 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.

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 play a key role in working 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. This will be no different for climate action.

Barriers to action and ways to overcome them

There are often wide-ranging political, organizational, technical, and behavioral challenges that constrain or create barriers to the use of budget management processes to drive climate action. Table B1 below illustrates some of the challenges facing Ministries of Finance and suggests strategies to overcome these barriers. This will usually require substantive political and technical leadership to drive through reform efforts within Ministries of Finance working closely with other government departments. In many countries this could involve a shift in Ministry of Finance organizational culture and structures, staffing, and skill sets to support policy-based planning, budget, and execution processes related to climate action, as described in the capabilities section of this report.

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 which can be factored into existing PFM reform agendas (Eguino and Delgado, forthcoming). Consensus is also emerging around the need to consider the entire budget cycle and all public sector and extra-budgetary expenditures, including subnational governments and state-owned enterprises.

Table B1. 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 MTFF - Creating a clear budget calendar that provides for policymaker decisions on strategic issues and provision of binding resource allocations.
Limited capacity to develop a substantive understanding of 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 of climate policy measures	Constrains policymakers' capacity to allocate available resources in an efficient and effective manner in accordance with national climate priorities.	Provide cross-cutting 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 the 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 an 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 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: Prepared by Peter Murphy (Expert advisory group)

Real world examples

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

- **France** prepared a Green Budget in 2021 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.
- The **EU** is an interesting example of a regional organization supporting 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. The **European Commission** has collaborated closely with the IMF and the OECD to develop common grounds for green budgeting practices (European Commission et al., 2021).

There are a wide range of existing and new tools emerging 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 public financial management (PFM) approaches which aim to adapt existing public financial management practices to support climate-sensitive policies.

Despite progress by some countries, green budgeting and PFM practices remain relatively nascent and the impacts unclear. According to the OECD (2021c) 14 out of 35 OECD countries surveyed (40%) reported that they have practiced green budgeting, and another nine that they plan to introduce some green budgeting practices in the future. Seven countries out of 21 OECD 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, forthcoming). 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 by Ministries of Finance to using the budget to drive climate action and ensuring that this is linked to driving tangible impacts in line with national climate commitments.

Various international and regional institutions are working at the global and regional levels to develop guidance and tools which address green PFM in considerable detail. 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 below.

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 ensure that the activities of public institutions are transparently recorded.

In contrast to the private sector, where initiatives such as the creation of the International Sustainability Standards Board (ISSB) have been underway to improve the accounting and performance measurement of climate, environmental, social and governance factors of firms, such developments are still nascent for 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) Contributing to the development of 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 which Ministries of Finance can consider.

- Given that Ministries of Finance are the key operators of public sector accounting systems and would constitute the principal user base 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 (where applicable) 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:

- The benefits of accrual accounting systems can support Ministries of Finance in efforts to transform economies to net zero. Benefits of accrual accounting are numerous, among them increased transparency and accountability and an improved ability to implement public policies (Cuadrado-Ballesteros and Bisogno, 2021).
- Adopting accrual accounting systems can also enable Ministries of Finance 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 (Mercator Fellow at the Grantham Research Institute)

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 stand-alone 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 enhancing its analytical, coordination, and communication capabilities, including by

drawing on a range of existing and new tools such as the PEFA-Climate methodology and budget tagging approaches.

- Contributing to the development of globally applicable public sector accounting standards and sustainability reporting. Ministries of Finance can do so by supporting the work of the International Public Sector Accounting Standards Board (IPSASB). Ministries of Finance can also consider adopting accrual accounting and existing IPSASB guidelines as these are partly suitable to 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.
- 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, as well as 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 emissions industries and incentivize rapid deployment (Coalition of Finance Ministers for Climate Action, 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 (Coalition of Finance Ministers for Climate Action, 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 transport infrastructure are already estimated at around US$18 billion per year (Hallegatte et al., 2019). The good news is that building resilience into the systems does not need to be expensive. A recent World Bank report finds that the extra cost of ensuring resilient power, water and sanitation, transport, and telecommunications systems only makes up 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 US$4.2 trillion globally, with $4 in benefits for each $1 invested (Hallegatte et al., 2019). Better integration of adaptation and resilience will require systematic screening of public expenditure to ensure consistency with adaptation targets (Hallegatte et al., 2020).

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

- Are public investment plans aligned with national climate and disaster risk management objectives, nationally determined contributions, 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, state-owned enterprises, and 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: (i) supporting the development of sectoral infrastructure plans aligned with adaptation and decarbonization objectives, in order to facilitate the identification of new projects and avoid investment assessments that marginally reduce emissions and increase the risk of stranded assets; (ii) incorporating physical risk analysis and management in the evaluation of infrastructure projects; (iii) estimating and applying the social price of carbon in the ex-ante evaluation of projects; (iv) incorporating resilience criteria in sustainable infrastructure maintenance projects; and (v) assessing the impact of sustainable infrastructure on the different dimensions of sustainability (IDB, forthcoming).

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

Two studies on the efficiency of public investment management in LAC (Contreras, Armendariz, 2016; Eguino et al., 2020) and a recent survey of management (IDB, 2022 forthcoming) highlight the need to further integrate climate action into public investment strategies. They find that:

- There is a weakness in public investment planning instruments, which has a significant impact on the alignment of investment programs with national decarbonization commitments and with resilience priorities.
- LAC countries (with the exception of Colombia) do not yet have taxonomies of green projects to guide public and private investors (Chile, Peru and Costa Rica are in the process of developing taxonomies).
- Most countries in the region do not have tools or models for prioritizing 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.
- Access to green finance for sustainable infrastructure investments is limited. The limited integration of the climate dimension in 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, forthcoming)

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). 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 towards taking into account climate considerations. 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 into account the socioeconomic costs of greenhouse gases, or savings made from avoided disruptions of more resilient infrastructure (see Capability 3).
- **Difficulties in project selection and prioritization.** The lack of alignment between investment plans and climate targets (see Section F2a), 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, as well as 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.

Overcoming these barriers will require Ministries of Finance not only to better integrate climate action into national investment planning systems, but 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. As the original PIMA did not sufficiently take climate considerations into account, a new PIMA module has been developed. This Climate-PIMA (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 (E3G, 2022).

Real world examples

Many countries are working on greening their public investment planning, yet progress has often been limited and confined to pilot projects:

- The **Mexican** Ministry of Finance and Public Credit—with support from the Inter-American Development Bank and the British Government—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 change action into analysis of the project portfolio and prioritizing projects with higher environmental, social, and economic multipliers at federal level (Delgado et al., 2021)
- The Ministry of Economy and Finance of **Peru** published General Guidelines for the Ex-Post Evaluation of Public Investment Projects in 2012, in which the methodology includes disaster risk identification along with the economic cost–benefit analysis (ibid.)

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

- **Ethiopia** depends heavily on rain-fed agriculture and is therefore particularly vulnerable to changing weather patterns caused by climate change. In response to this 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. Moreover, adaptive capacity assesses how non-physical aspects of a project such as institutional capacity can reduce the risk level. Lastly, the overall risk of a project is evaluated based on the outcomes of the aforementioned components. This process is a prerequisite step for submitting a proposal to the Ministry of Finance for funding and it is meant 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. The objective of this methodology is to incorporate disaster risk analysis and assessment into the preparation and evaluation of projects submitted to the National Investment System. It serves to guide planners, evaluators, and decision-makers with design and execution of infrastructure projects in areas exposed to disaster risk threats, taking into account not only their suitability but also 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 life cycle as part of the National Public Investment System. Steps covered include the analysis of the location of projects, identification of vulnerabilities, quantification of project risks from natural disasters, analysis of risk reduction alternatives, and quantification of the costs and benefits of disaster risk mitigation (adapted from (Delgado et al., 2021).

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 [21]

Context and role of Ministries of Finance

Connected to the use of public budgets is public procurement, which amounted to US$11 trillion out of global GDP of nearly US$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 life cycle compared

[21] This section draws heavily on Eguino and Delgado (forthcoming).

with goods, services and works with the same primary function that would be procured otherwise (World Bank, 2021c).

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 transport, 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 and power plants). There are many possible applications, from prioritizing the purchase of electric vehicles for public fleets, 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 consumption and resource use patterns (European Commission, 2016; OECD, 2015a).

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 risen, with calls in many countries for greater accountability in government procurement decisions (OECD, 2015).

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 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 freed up for other key public sector initiatives (European Commission, 2016).

There is growing recognition of the potential net benefits to Ministries of Finance from introducing green procurement practices across government. 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 EC's *Buying Green* handbook (2016, 3rd edition) 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 entails important challenges, among which the following stand out (Salazar Cota et al., 2018).

- **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 its benefits 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 product and service groups, public authorities do not have access to clear and verifiable criteria that would allow them 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 (actual or perceived) need to balance traditional procurement objectives (such as efficiency, economy, 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 behind globally recognized standards for green procurement and tracking public sector performance.

To overcome these barriers to action, some of the critical factors needed for implementing successful green procurement reforms include (see for example, (World Bank, 2021c).

- **Conducting market research.** It is important to conduct market research to determine 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.
- **Create awareness.** It is important to promote widely in local and national media the opportunities that green procurement generates for various suppliers.
- **Training.** Training is critical, particularly on the legal and technical aspects of implementing green procurement such as life cycle costing, or the sustainable use of products.
- **Monitoring and evaluation.** The use of M&E systems to measure results is essential for tracking progress as well as identifying areas for improvement.

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 Methodology for the Assessment of Public Procurement Systems (MAPS).

Real world examples

There is emerging recognition in a growing number of countries of 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 regions such as Latin America and the Caribbean. In a recent study, 20 of the 23 countries in the region surveyed 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 (Wierzbicki and Harper, forthcoming cited in Eguino and Delgado, forthcoming). 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 also consider options for strengthened measures for sustainable or green procurement. In particular, they should consider**:**

- Establishing a legal and policy framework for green public procurement to assist procuring entities to incorporate climate objectives in 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, as well as 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 as well as 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. Reforming financial policy and the financial system to finance the transition at speed and scale

[Helsinki Principle 5]

This section explains how Ministries of Finance can draw on three main, mutually-supportive sources of capital—public, private, and international—to raise, steer, and blend sources of finance to drive climate action. It covers:

- **Function 3a: Domestic revenue mobilization to finance investment**. This includes:
  - **Broadening the domestic revenue** base through a range of tax, spend, and debt management instruments, enhanced tax collection, and international cooperation on profit shifting.
  - **Debt financing** for investment in sustainable infrastructure, including through green bonds, in line with a responsible debt management strategy.
  - **Enhancing sub-sovereign finance** to improve the access that fast-growing cities, towns, and regions have to new sources of capital for infrastructure investment.
- **Function 3b: Greening publicly backed financial institutions and central banks.** This includes:
  - Greening national development banks and green investment banks to promote the growth of new sectors and leverage private and other sources capital.
  - Greening sovereign wealth funds and state-owned enterprises.
  - Greening central banks and coordinating monetary-fiscal policy.
- **Function 3c: Accessing deep pockets of private capital to finance the transition**. This includes:
  - **Greening the financial system and financing green**, including the banking, investment, and pensions sectors, and encouraging the establishment of Green Financial Centers.
  - **Supporting the development of new catalytic instruments,** including for blended finance and PPPs, to respond to the barriers to zero carbon, climate-resilient investment.
  - Bringing these multiple sources of finance together and aggregating investment opportunities through **Sustainable Financing Roadmaps.**
- **Function 3d: Providing disaster risk financing and insurance for all.**
- **Function 3e: Leveraging international climate finance** and the global financial architecture. This includes:
  - **Getting 'climate finance ready'** for effective access to MDB and DFI capital.
  - Accessing emerging sources of finance from **international voluntary carbon markets**.
  - Setting up **country platforms.**

Introduction: Financing a big investment push[22]

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 transport. In many countries these investments will need to take place in the context of underdeveloped financial sectors and revenue models, where there is a lack of investment-grade assets, high cost of capital, short tenors in local currency and weak financial safety nets (Bhattacharya et al., 2022). Many sustainable infrastructure investments face a range of market and non-market failures which lead to an undersupply of private capital for investment.

Ministries of Finance will need to draw on three main sources of capital to finance investment needs: public, private 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. Nature conservation has significant spillover benefits, creating a case for public finance and/or official international finance. Early-stage sectors relying on new technologies will require a greater mix of concessional public finance. Ministries will therefore need to ensure financing sources match the spending purpose, maturity required and local context when developing green financing strategies.

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 in Functions 1 and 3). 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. Paris Agreement Article 2.1c focuses ensuring all finance is aligned with the adaptation and mitigation goals of the Agreement. Ministries of Finance will be responsible for much of the work to align public finance flows and in supporting the alignment of private and other flows (Rydge, 2020). The tools outlined in this section can play a key part in this endeavor. This section does not currently distinguish between measures to mobilize new sources of finance for investment and aligning greening finance. Instead, both issues are covered in the relevant sections below.

Function 3a. Mobilizing domestic revenue to finance investment

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 to help finance capital investment for sustainable and resilient infrastructure. 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 is upwards of 25% for advanced economies (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, subsidy reforms and property and land taxation tied to sustainable infrastructure improvements; and reforming general forms of taxation such as income tax and VAT, and exploring new revenue sources such as on 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 towards 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 were outlined under Functions 3a and 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. They can do this in a range of ways, including:

- Considering ways to better tax the digital economy and stem illicit financial flows. This would include measures to tackle tax evasion, corruption, and illegal activities.
- Engaging with the Inclusive Framework on Base Erosion and Profit Shifting (BEPS). This is 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 US$100–240 billion per year (OECD, 2015b).
- Engaging with the Global Forum on Transparency and Exchange of Information for Tax Purposes. The forum promotes enhanced cooperation between tax authorities to help better capture tax revenue from money shifted abroad.

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.

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. Recognizing 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 on the sidelines of COP27 has launched different initiatives, among them Ireme Invest, a US$ 104 million green investment facility to improve private sector access to green finance (Rwanda Ministry of Environment, 2022).

Debt financing for investment in sustainable infrastructure, including through green bonds[23]

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 US$100 trillion global debt market.[24] 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, particularly well-suited to the sustainable infrastructure investments and adaptation investments.

One rapidly growing category of debt is green bonds. Green bonds 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. 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; the Climate Bonds *Sovereign GSS Bond Survey* 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. Not only does this provide reputational and visibility benefits but 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. A sovereign can increase visibility of their bond by obtaining Climate Bonds Certification on their bond.[25]

Despite the merits, Ministries of Finance should 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 on a country-specific basis. Some Ministries of Finance can investigate the possibility of debt-for-nature swaps to reduce their debt-to-GDP ratio.

[23] This section draws heavily on a contribution from Vangelis Papakonstantinou (CBI) and Aaron Drayer (GGGI) for Peru's experience.

[24] Bloomberg 14 July 2022. Outstanding debt with a maturity greater than or equal to one year.

[25] This is seen as the gold standard for green bonds by investors and certifies alignment with the goals of the Paris Agreement.

Barriers to action and how to overcome them

The barriers to using debt to finance is 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%. Further, about 60% of low-income developing countries are in high risk of debt distress (IMF, 2022b), 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). Moreover, 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** (as of November 2022). 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. I**nvestment in resilience infrastructure 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. This 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.

Ministries of Finance should therefore 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.

Ministries of Finance considering the use of green bonds have a range of strategies that can help them to overcome the most common barriers to issuance. While the Climate Bonds *Sovereign Green, Social, and Sustainability Bond Survey 2021* revealed that issuers tend to find the benefits of issuance outweigh the challenges, particularly salient challenges and strategies to overcome them include:

1. **Identifying a pipeline of eligible expenditures.** Ministries of Finance can be hesitant to issue green bonds due to perceptions of 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 expenditures, for example. This gives room to choose only the greenest expenditures.
2. **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.

3. **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.
4. **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 US$15 million **Seychelles** blue bond included a partial credit guarantee of US$5 million and arranging concessions from the Global Environment Facility which lowered the cost of issuance to save the country US$8 million in interest payments over 10 years.
5. **Ability to increase government debt.** Ministries of Finance may be unwilling to issue more government debt and further increase 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 towards 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.
6. **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 sustainability bond issuances. Examples include:

- Fiji used around 90% of the proceeds from its 2017 green bond for adaptation. Use of proceeds (UoP) included reconstruction of schools damaged by 2016's Tropical Cyclone Winston, agricultural resilience to drought and flood and adaptation research.
- Thailand's TBH50 billion (US$1.6 billion) sustainability bond funded both the construction of an electrified rail line of the Bangkok metro (THB30 billion) and social projects.
- Chile is the first sovereign to have issued with the green, social, and sustainability labels combined. In March 2022 it issued a world-first sovereign sustainability-linked bond (SLB). The US$2 billion issuance used the KPIs recommended in the World Bank's report on KPIs for sovereign SLBs. The KPIs target emissions reduction of 15.4% and peaking by 2030 and a 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.
- The Government of Peru's 2021 Sustainability Bond issuance is the largest-ever Sustainability Bond from Latin America and the Caribbean. The US$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.
- 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 expenditures, and compiling a list of second party opinion providers.

A sovereign can increase visibility of their 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, Nigeria, and the green component of Thailand's sustainability bond. In Indonesia, climate budget tagging helped the Ministry of Finance to develop 'Green Sukuk' or Sharia-compliant bonds to finance climate change mitigation and adaptation projects.

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 for some member states as part of the Stability and Growth Pact, which capped the public deficit to under 3% and debt to under 60% of GDP, which many countries currently exceed due to the economic crisis. The objective of the suspension is to raise public investment for the green transition while giving an opportunity for EU member countries to assist those most impacted by rising energy prices. The EU is looking to extend 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. The final decision about the suspension, at the time of writing, still has to be approved by member states (Euronews, 2022a). Similar measures to finance climate-related investments have been enacted by the **Netherlands.**

Several countries are also considering debt-for-climate 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 such as Bolivia, Ecuador, Indonesia, and the Seychelles, since the 1980s (IIED, 2021).

Enhancing sub-sovereign finance to support fast growing cities and towns

Context and role of Ministries of Finance

Towns and cities 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 costs of sprawl, all while reducing carbon emissions (Coalition for Urban Transitions, 2019, 2021)However, the sustainable urban infrastructure financing gap globally currently exceeds US$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).

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. 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 transport infrastructure leads to increased land and property values nearby. This uplift in value 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 (Ahmad and Colenbrander, 2020). 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 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, 2017). There are many forms of PPP, but their potential is typically limited to projects that involve commercial returns on revenue-generating assets. Energy and transport infrastructure projects have attracted the vast majority of global PPP finance.

Real world examples

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

- In the 2021 Spending Review, the **UK Treasury** committed an unprecedented investment package of £5.7 billion for eight English city-regions to transform local transport 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 (Mayor of London, n.d.).
- In **Uganda,** local governments struggle to collect property tax efficiently. This source of revenues accounts for only 0.1% of total revenues. 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 US$125 million for investments in renewable energy, landfill methane capture, and hybrid-fuel buses (C40, 2015).
- 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 (US$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 US$8.2 billion is currently actively invested in PPPs, and US$67.6 billion has been mobilized in the past 25 years for nationally significant infrastructure.

Opportunities for action

Ministries of Finance should urgently 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 within a responsible macroprudential framework. 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 towards 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.

As part of their debt management strategy, Ministries of Finance should explore the greater use of green bonds in partnership with relevant line ministries. 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.

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 transport systems. Options might include reforms to land and property taxes, and reforming national regulations to allow local borrowing with sufficient fiduciary oversight.

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

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 US$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 play an important role in shaping their strategies at the board level. Around 10 NDBs operating in China, Germany, Brazil, India and South Africa account for US$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 or 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.

Barriers to action and ways to overcome them

Ministries of Finance may face strong resistance to increasing the role of NDBs or establishing GIBs to tackle the climate crisis. This might be due to a range of factors including 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.

- First, it should be relatively straightforward for Ministries of Finance to assemble evidence on the economic case for growing the role of NDBs and GIBs 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 OECD, 2016, for example). 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.
- Second, NDBs and GIBs can complement central government leadership by being more flexible and familiar with markets and private companies.
- Third, Ministries of Finance can explore a wide range of funding sources for NDBs, including general budgets, carbon tax revenue, ETS revenues, utility surcharges, loans, bond issuances, or from MDBs and Regional Development Banks.

It is also 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 fulfil 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. Bancoldex, the Colombian Bank for External Commerce, recently prepared a program to finance innovative, low-carbon public transport technologies in Bogota. This led to new investment worth over US$80 million with mixed sources of finance in over 300 hybrid and electric buses.

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

Greening sovereign wealth funds[26] and state-owned enterprises

Context and role of Ministries of Finance

Ministries of Finance are often major shareholders in publicly backed institutions such as sovereign wealth funds (SWFs) and state-owned enterprises (SOEs). As a result, they are in a position to play a major strategic role in pushing for these entities to invest in a low-carbon, climate-resilient future. 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). The 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 (e.g. Singapore's GIC). In some cases, the Ministry of Finance give 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 US$9.3 trillion of assets, only 30% have a target to reduce emissions across their investments (Kyriakopoulou et al., 2021). Over 70% of oil and gas production assets and 60% of coal mines and plants globally are state owned (IEA, 2020; OECD, 2021c). A recent study shows that the state-owned sector is responsible for at least 7.49 gigatonnes of carbon dioxide equivalent ($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. There are powerful incentives for them to prioritize doing so. 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. And governments can leverage the expertise, skills and capacity of SWFs and SOEs as high-caliber investment professionals employed by the state (Kyriakopoulou, 2020). Without action, risks will only grow. Stranded asset risk, for example, is starting to feed into shareholder assessments of the long-term value of SOEs. In 2016, Vattenfall, **Sweden**'s state-owned multinational power company, sold its coal assets, citing commitment to sustainable energy.

Similarly, there are financial risks 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

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

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 US$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 countries, 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 by 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, which can be adjusted to explicitly include the objective of reducing carbon emissions. This 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). The Treasury of **New Zealand** provides an example, having mandated the Crown Finance Institutions including the country's SWF to provide transparent reporting.
- **Budget support.** Providing budgetary provisions to cover the costs of analyzing portfolios' carbon footprints as well as to invest in capability, governance and new skills both at the board level and across management and staff.
- **Creating incentives.** Directly establishing incentive structures for management that recognize the importance of climate objectives or mandate the funds' boards to do so.
- **Education and training.** Providing 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.** Ministries of Finance can provide direction and create incentives for SWFs and SOEs to adopt sustainable investment guidelines. For example, **Norway**'s Ministry of Finance has adopted Guidelines for Observation and Exclusion of Companies from its sovereign fund (see below).

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)**.** These include:

- **Norway's** Government Pension Fund Global (GPFG), the world's largest SWF. With assets of over US$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 of Finance 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 anchors the GPFG's mandate in line 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 in June 2021 its Green, Social and Sustainability Bond Framework to strengthen its ability to promote sustainable development in line with the mandate received by the Italian Ministry of Economy and Finance (its biggest shareholder) (CDP 2021). 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). In 2018 it issued its first sustainability bond, a €500m 'Hydro' Bond aimed at promoting the development and modernization of the Italian water supply network. It has since issued several follow-up green bonds.
- The **New Zealand** Superannuation Fund is one of the few funds with an explicit emissions-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 US$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).
- Masdar, a subsidiary of **Abu Dhabi's** 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 towards renewables, and to promote sustainable development, including the planning of an 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 SEOs to take into account the objective of achieving a carbon-neutral Finland by 2035. Similar measures exist in **Germany** and **Ireland.** In **Singapore**, Temasek, the state-owned investment company, integrates climate-related objectives in its strategy and drives these objectives through engagements with portfolio companies. In **Sweden** and **Norway**, ownership entities hold regular discussions with supervisory boards of SOEs.

Greening central banks and fiscal and monetary policy coordination[27]

Context and role of Ministries of Finance

Central banks are powerful institutions that can, if their mandates allow (Dikau and Volz, 2021)**, go much further in contributing to a sustainable recovery and supporting governments' commitments to the goals of the Paris Agreement**. Central banks began embracing the climate action agenda between the global financial crisis and the COVID-19 crisis. However, their roles to date have largely been constrained to protecting the financial sector from climate-related risks driven by taking care to avoid criticism of 'mission creep' by anchoring their actions primarily through a risk-lens (OMFIF/Mazars, 2020). Protecting the financial sector from climate-related risks is welcome, important, and well-linked to most central banks' primary objective of price stability but they can go much further. They can now do more to encourage investment in the new economy, including by working closely with Ministries of Finance.[28] The question is not one of lack of useful instruments, but one of clarity of mission.

Ministries of Finance can enable central banks to go further by resolving 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 bank powers extend past this across their functions as 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, as outlined further below.

Mainstreaming climate (physical and transition) risks into the mission of central banks is important for several reasons (Boneva et al., 2021; NGFS, 2020, 2021b):

- **Risks to macroeconomic variables:** Physical and transition risks (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 rate, inflation and inflation expectations.
- **Risks to transmission monetary policy.** Climate change may affect the balance sheets of financial intermediaries, asset valuations, and the expectations of economic agents. Risks of stranded assets, increased credit risks, and shifts in expectations among economic agents may all impair the transmission of monetary policy.
- **Risk to balance sheets.** Climate change could increase the riskiness of assets held on central banks' balance sheets, potentially leading to financial losses.

In response, central banks may need to consider a range of options to factor climate change into their monetary policy frameworks. These include exploring ways to incorporate climate variables in 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 even excluding some assets or issuers from purchases if they fail to meet climate-related criteria.

[27] This section draws on a contribution from Danae Kyriakopoulou, 2022 and Simon Dikau (Grantham Research Institute)

[28] 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 (G20, 2015; FSB, 2015a; FSB, 2015b). Mark Carney's 2015 '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 and it had grown to around 60 members at the start of the COVID-19 pandemic and to over 110 members at the time of writing.

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)may be necessary actions, therefore, including requiring financial institutions to disclose their exposure to climate-related risks, stress testing the potential losses, adjusting capital requirements with a 'green supporting factor' or 'brown penalizing factor', or requiring mandatory transition plans.

Ministries of Finance can play a particularly important role in encouraging central banks to move beyond risk management to leverage their reserves for sustainable investment. Central banks usually manage sizeable reserve portfolios with collective assets under management at over US$15 trillion globally (Kyriakopoulou et al., 2021) including foreign exchange reserves, own funds, pension portfolios, and third-party portfolios.[29] They should be encouraged to (i) 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; (ii) develop sustainability criteria and embed them in investment analysis; (iii) introduce positive and negative climate performance criteria for investments; (iv) invest directly in sustainable assets such as green bonds; and (v) 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 also 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 Finances. 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

As illustrated, central banks are powerful and well-equipped institutions to support the transition to net zero. But they face barriers in doing so. Most importantly, central banks are 'policy-takers' from national government as well as 'policy-makers'. 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,[30] their capacity to act in many cases depends on the remit letters of Ministries of Finance setting out how far the government's priorities are relevant for the central bank.

The most important tool that Ministries of Finance have, therefore, is their power to explicitly set out and update central banks' responsibilities and remits to bring them in line with their government's own net zero commitments. The UK experience provides an instructive case of the decisive impact Ministry of Finance action can have (see below). 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:

[29] For treatment of policy portfolios see the earlier section on monetary policy.
[30] This applies to around 40% of central banks (Dikau and Volz, 2021).

- 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 reserves management. Central banks in some cases will 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

There are strong examples of the role that Ministries of Finance can play in reshaping the remit of central banks. In the **UK, the Bank of England's (BoE)** takes forward work related to climate change consistent with its primary objectives on monetary and financial stability, but HM Treasury also send to the BoE's three policy committees - the Monetary Policy Committee (MPC), Prudential Regulation Committee (PRC) and Financial Stability Committee (FPC) - annual 'Remit and Recommendation' letters which articulate the Government's economy strategy the committees should have regard to. The most recent 2022 letters state the Government's economic strategy embeds "delivering Net Zero" along with increasing long term energy security, within the context of a government policy that is 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 should regard climate change as relevant to both its primary and secondary objectives (i.e. to promote financial stability and support the government's economic policy). For the PRC the committee should have regard to supporting 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 towards achieving compliance with [the UK's Net Zero target]'.

In the European Union, 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 two-tier: primary is to maintain price stability, and secondary is to support the general economic priorities in the Union. Through its secondary mandate the ECB can pursue action which supports the net-zero targets of the European Union and does so 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. However, whilst the market neutrality principle provides challenges, the shortcomings of the 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).

Opportunities for action

Ministries of Finance should urgently look for opportunities to leverage their shareholder positions in state-owned entities and their relationship with central banks to drive climate action and investment.

Ministries of Finance should work with relevant line ministries to green national development banks, 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.

Where NDBs do not exist, Ministries of Finance should consider setting up dedicated green investment banks. In so doing they could carefully consider establishment costs, level of independence, mandate and culture, financing approaches, and level of investment risk before proceeding.

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 reserves management, and encourage sovereign green bond issuance.

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

Greening the financial sector[31]

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. US$130 trillion worth of private capital through the Glasgow Financial Alliance for Net Zero (GFANZ), for example, is now committed to align its activities with net zero and is increasingly targeting Paris-aligned lending and investments (CPI, 2022). Unlocking this private finance to drive the transition is particularly important. In the context of the investment opportunity, greening the financial system (or perhaps, more accurately, '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, 2021). This includes from:

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

Greening pensions is a particularly pertinent issue. This is because green pensions are becoming increasingly attractive to pension holders. A growing landscape of potentially competitive green investments and emerging research suggesting 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.

Ministries of Finance will also need to pay attention to preventing the financial system becoming a major source of financial instability. Climate change is a source of financial instability due to the

[31] This section draws on Coalition of Finance Ministers for Climate Action, 2021a.

physical risks related to climate damages, as well as the risks stemming from the transition to net zero, particularly a disorderly one. While the issue of systemic financial sector risk should be a central concern of central banks, regulators and supervisors, this agenda should be an equal concern for Ministries of Finance. One of the leading priorities for most Ministries of Finance is the maintenance of growth and a stable macroeconomic environment. Their engagement on this agenda is critical for at least two reasons: first, Ministries of Finance often set central bank and regulator mandates (as laid out above); and second, Ministries of Finance are usually forced to play the central role in responding to financial crises. Moving forward there is likely to be an ever-growing interconnection between climate action and maintaining financial stability. Failing on one with imply failing on the other (Dafermos et al., 2018).

Physical and transition risks can materialize into financial risk, impacting the financial sector in five main ways (Coalition of Finance Ministers for Climate Action, 2021a):

- **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 lead to fire sales, which could trigger a financial crisis.
- **Liquidity risk:** Banks' balance sheets which 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.

Barriers to action and ways to overcome them[32]

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. They often find integrating climate-related risk analysis into financial stability monitoring particularly challenging (Bolton et al., 2020). This is because they comprise physical and transition risks with complex, far-reaching, non-linear, chain reaction effects. Exceeding climate tipping points, for example, could lead to catastrophic and irreversible impacts that would make quantifying financial damages impossible. These could lead to so-called 'green swan' events and cause the next systemic financial crisis (ibid., which 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.

This challenge is partly because Ministries of Finance, regulators, and financial service providers use backward-looking risk assessment models that merely extrapolate historical trends and prevent full appreciation of future systemic risks (Bolton et al., 2020). Similarly, few draw on the latest analytics and models which give a clear picture of real investment opportunities and their macroeconomic impacts (see Capability 3). Moreover, the actual financial sector itself often 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. That said, recent studies show some signs that financial markets are beginning to anticipate the transition away from fossil fuel investments. For example, the share of the

[32] Note: the issue of underdeveloped local capital markets will be addressed in further detail during the final draft

fossil fuel energy sector in the US S&P 500 index fell from 13% a decade ago to around 3% in 2020 (IRENA, 2021) and the main rating agencies now consider the financial impacts of climate change in their rating processes (FSB-TCFD, 2021). But more work is still needed.

Ministries of Finance should work with line ministries, central banks, regulators, and supervisors to address these gaps. 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 to meeting climate objectives and responding to the identified risks and opportunities
    - Identifying the key barriers to implementing the roadmap
    - Identifying the different financial sector actions 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 transition plans to be developed with financial and other commitments.
- **Working to support the central bank, regulators, and supervisors to develop a robust supervisory response to address climate-related risk** (including disclosure requirements). 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 introducing regulatory reform to help private actors manage climate-related risks.
- **Considering developing a green taxonomy.** This is a classification system to identify environmentally sustainable economic activities that contribute to climate goals.

Real world examples

There is an ever-widening suite of private financial institutions that have committed to aligning their activities with net zero. As of mid-2022, according to analysis by CPI, at least 547 financial institutions representing US$129 trillion in assets under management and advice have 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.)

There is an ever-widening suite of countries developing green finance roadmaps for the financial sector with the active leadership of Ministries of Finance. This includes 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 examples of green finance roadmaps include:

- In July 2019, the **Netherlands** national climate and energy plan (NCEP) included a commitment by the financial sector, signed by over 50 institutions with combined assets of over €3 trillion, to mandatory measurement and reporting of emissions. As of 2022, institutions will publish action plans that outline how they will contribute to a decrease in CO_2 emissions. As part of the commitment, financial institutions will exchange knowledge and best practice on methodologies and actions that financial institutions can undertake to align their portfolios. The financial sector aims to make climate methodologies more comparable with each other and to work towards further harmonization.
- In a similar exercise in **France**, in July 2019 financial institutions in Paris committed to publish individual coal exit strategies. These commitments, made to the Minister of the Economy and Finance, mean that by 2030 most French financial institutions will no longer finance coal in the EU and OECD countries, 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 both 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 a standard for determining activities and considerations in the formation of national initiatives including the decarbonization of state-owned enterprises. It could also be expanded 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** has a variety of initiatives underway in its effort to be among the world's top green financial sectors. These include the Sustainable Finance Initiative, Luxembourg's effort to innovate and consolidate its sustainable finance activities in line with the national sustainable finance strategy, an outcome of the 'The Luxembourg Sustainable Finance Roadmap' developed in 2018 together 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, its objective is to raise awareness, promote and help develop sustainable finance initiatives in Luxembourg.

These efforts should soon start to pay off. A recent empirical study to measure the effects of climate-related financial policies on carbon emissions in G20 countries from 2000 to 2017 (D'Orazio and Dirks, 2022) suggested that countries that adopt a climate-related financial policy see a statistically significant negative impact on carbon emissions in both the short and long terms (ibid.). And it is positive that there is an ever-widening suite of private financial institutions that have committed to aligning their activities with net zero, as described above.

Box B10. Establishing Green Financial Centers

There is now a growing realization that green finance has strategic implications for the world's more than 100 financial centers (FC4S, 2022; UN Environment, 2018).

Green Financial Centers can help to accelerate the expansion of sustainable finance by being place-specific, generating an agglomeration or clustering effect across different sectors and institutions. They are nodes of innovation and the uptake of both 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 (FC4S)'s 2022 survey of the world's financial centers shows that financial centers are increasingly embracing sustainable finance (FC4S, 2022). However, 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

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 US$7 trillion out of the US$130 trillion in GFANZ (less than 6%) is in EMDCs (GFANZ, 2021). Given that sustainable investment needs tend to be frontloaded and capital-intensive and is subject to a range of risks, in emerging markets and developing countries these risks tend to be compounded by macroeconomic, currency, political risks, and lack of certainty around government commitments, plans, and policies (High-Level Advisory Group on Sustainable and Inclusive Recovery and Growth, forthcoming).

Blended finance instruments, which can form part of a green financing strategy, can 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 with 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, it is slowly becoming more mainstream. Blended Finance 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. Convergence, a global Blended Finance network founded in the context of the 2015 Addis Ababa Action Agenda, recently published its 2022 "State of Blended Finance" report. According to Convergence, in the last decade there have been on average 56 blended finance deals per year, yielding an average annual financing of US$ 10.7 billion of annual financing per year (Convergence, 2022). However, blended finance flows were only US$4.5 billion in 2020 (ibid.). MDBs and DFIs tend to be more prominent investors in Blended Finance transactions compared to bilateral development agencies. Blended finance transactions specifically targeting climate focus mostly on mitigation rather than adaptation activities 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 differing nature of respective risks. Macroeconomic volatility or currency risks may be more pronounced in EMDCs. Similarly, political and regulatory risk may be higher and differing 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 IFC's visibility among Finnish private sector and sector-specific industries of procurement opportunities in IFC and World Bank projects.

Ministries of Finances can also encourage MDBs and DFIs to adopt innovative blending approaches to boost available capital. MDBs as well as internationally active NDBs have unique expertise in structuring and financing (green) infrastructure projects in EMDCs as well as 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) 'Room2Run2' transaction, a synthetic securitization of seasoned private sector loans, freed up US$600 million for additional lending for 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 US$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

Investment needs are concentrated in sustainable infrastructure, particularly in EMDCs. Despite the strong case for this investment, private finance is not flowing at a large enough scale to fund the transition. Investment needs are concentrated in sustainable infrastructure, particularly in EMDCs. Direct investments in such assets 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., 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 B2 below 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 DAC has produced a set of blended finance principles to facilitate good practices in the blending sphere. One of the principles 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 together with local partners and building on their knowledge and expertise can help establish awareness of the local context, thereby potentially reducing barriers to local market building (ibid.).

Table B2. 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., 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.
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 availability of public finance. In 2009 the Indonesian 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.
- In 2017, **Finland** and the International Finance Corporation partnered to launch the Blended Finance for Climate Program (BFCP). The program seeks to use official development assistance 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.
- In the wake of the G8 Summit of 2008, the **German** Ministry for Economic Cooperation and Development (BMZ) launched the Africa Agriculture and Trade Investment Fund (AATIF) in 2011, a US$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.
- In June 2022, **Luxembourg's** Ministry of Finance partnered with Schroders and its impact investment specialist BlueOrchard Finance Ltd 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. At the launch of the Partnership, Luxembourg Minister of Finance Yuriko Backes highlighted the importance of mobilizing capital for the climate agenda and positioned the partnership as a step to strengthen 'long-term commitment to blended finance'.
- Several **specialist global platforms are also emerging in the blended finance space**. In 2016, Canada's Global Affairs department together 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 GAC committing US$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 work streams; or the Blended Finance Taskforce founded by the Business & Sustainable Development Commission.

Bringing sources of finance together in sustainable finance roadmaps

Context and role of Ministries of Finance

One way that Ministries of Finance can help to organize the different range of actors involved in sustainable finance around a common conception of their roles and responsibilities is through the development of sustainable finance roadmaps or strategies: these build on the idea of roadmaps for the financial sector, as outlined above. These roadmaps can help prioritize actions and coordinate activities among stakeholders, including policymakers, regulators, companies, and financial sector

participants to accelerate the expansion of sustainable finance. Sustainable finance roadmaps with a specific focus on the financial sector are a sub-set of these strategies.

Spearheaded over the last decade by the UN system (UNEP Finance Initiative and the TCFD), sustainable finance roadmaps provide recommended actions to enhance sustainable finance within and outside financial systems. Recent analysis by the Coalition for Finance Ministers and FC4S showed that over 40 roadmaps have been drafted to date globally, in all regions of the world. 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 introducing regulatory reform to help private actors manage climate-related risks.
- **Encourage enhanced disclosure** of climate-related risks by private companies through the use of taxonomies.
- **Evaluate public sector investments** for their contributions towards 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, 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 recently published G20 Sustainable Finance Roadmap (G20, 2021), which seeks to promote international coordination on approaches to identifying and aligning investments to sustainability goals.

Barriers to action and ways to overcome them

There are many barriers to developing effective sustainable finance roadmaps, such as inadequate assessments of investment gaps in key sectors and a lack of existing coordination mechanisms. Many of these can be overcome but they will typically demand a strong role for the Ministry of Finance, relevant line ministries, the central bank, and other regulators.

Recent analysis by the Coalition for Finance Ministers and FC4S identifies 13 key criteria for an effective sustainable finance roadmap (Coalition of Finance Ministers for Climate Action, 2021a)**.** While each national roadmap must be tailored to the country context, effective documents typically:

- 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 sustainable development goals
- Include an estimate of the investment gap in low-carbon, climate-sensitive sectors
- Conduct an analysis of challenges and obstacles to scaling 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 the 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.

Real world examples

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 Japan, Luxemburg, Nigeria, Mexico, and Switzerland (Coalition of Finance Ministers for Climate Action, 2021a). The roadmaps are intended to allow for the prioritization of necessary actions to be taken (from regulators and supervisors to corporations and financial sector participants) to successfully realign national financial systems for sustainable development. Recommendations put forth most frequently in country roadmaps center around reporting and disclosure measures and accompanying transparency measures of firms and financial institutions. Ministries of Finance should look to consider the full scope of issues relevant to transforming the financial system by both public and private sector actors. The analysis and conclusions drawn by the analysis of sustainable finance roadmaps, may result in increased awareness by all national stakeholders of sustainable finance, may inform future training programs, can potentially help Ministries of Finance improve data availability and quality, and may inform future recommendations for Ministries of Finance wanting to develop of sustainable finance roadmaps.

Opportunities for action

Ministries of Finance need to do more to help raise, steer and blend private finance for investment at the speed and scale required. To do so, they should consider establishing multi-stakeholder platforms or taskforces to support the creation and implementation of Sustainable Finance Roadmaps within and outside the financial system.

These roadmaps would typically have the following attributes or features:

- **Inclusivity**. They would involve the Ministry of Finance, other key departments, the central bank, supervisors and regulators, key financial sector actors, industry bodies, other private sector, and key experts.
- **Accountability.** They would 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.** They would be supported by a process that is adequately resourced and supported by technical working groups to drive forward plans in key action areas.
- **Investment pipelines.** They would 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**. They would work with central banks, regulators and supervisors to identify and address the main climate-related risks to the financial system.
- **Networks.** They would encourage central banks and financial sector actors to participate in international networks 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**. They would include effective approaches for disaster risk financing and mobilizing international climate finance.

Function 3d. Providing disaster risk finance and insurance for all

Context and role of Ministries of Finance

The macroeconomic costs of natural disasters, including the immediate decline in GDP growth and the cumulative, permanent GDP loss during the years following a major disaster, can significantly affect government budgets. 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 the same time, public expenditure rose by 30%, resulting in an increase in the fiscal deficit of over 23% over these two years (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-middle-income countries and 0.9% of GDP for the low-income group (Alejos, 2018).

While risk financing cuts across different agendas and is often seen as belonging to specialized agencies, successful risk financing and insurance measures are almost always anchored in and driven by Ministries of Finance (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, and benefits the most from, implementing disaster risk financing. In this case other units within the Ministry of Finance, 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 mostly addressed the financial effects of natural disasters on an ad-hoc basis: they now need to increasingly focus 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**. This aims 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 which allows governments to secure funds in advance of a disaster to be available immediately in case of emergency.
- **Property catastrophe risk insurance**. This aims to protect homeowners and SMEs against loss arising from property damage. Examples include Catastrophe Insurance Pools, and public-private Partnerships between the government and the domestic insurance industry.
- **Agricultural insurance.** This aims 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**. This aims to help governments strengthen the resilience of the poorest and most vulnerable to the debilitating effects of natural disasters 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 for advance planning within the Ministry of Finance and wider government. This requires strong public financial management experience and trained officials, including the ability to conduct complete fiscal forecasts that incorporate different disaster scenarios and that are then regularly monitored. However, these elements for fiscal monitoring are not found in most countries. For capabilities that do not yet exist in-house, for instance on risk modeling and disaster forecasting, Ministries of Finance can also temporarily consider outsourcing some of these activities 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.

Supporting comprehensive and affordable insurance coverage of disaster risks across economies with varying levels of insurance market development is a particularly acute challenge. 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 (Eguino and Delgado, forthcoming). The existing international datasets recording climate-related events are often not (fully) publicly available, or provide 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 the 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 with certain strategies. 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.
- Private sector involvement as an essential partner. The private sector can 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, such as 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 (Box B11). Recently, the Ministries of Finance of four **Pacific Alliance** countries joined efforts and in 2018 developed the issuance of a catastrophic bond that provides risk

coverage differentiated by country: US$500 million for Chile, US$400 million for Colombia, US$260 million for Mexico and US$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 fisheries sector activities. Since CCRIF's inception in 2007, the mechanism has made 54 payments for hurricane, earthquake and rainfall damage to 16 member governments amounting to more than US$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.

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, among others. Along these lines, in 2009 the Inter-American Development Bank (IDB) created the Contingent Credit Facility for Natural Disaster Emergencies (CCF). Since its creation, the CCF has provided US$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, forthcoming). Other MDBs such as the World Bank have established contingent financing for natural disasters.

Box B11. Jamaica: The Role of the Ministry of Finance in Developing Disaster Risk Financial Strategy

Governance Framework and Risk Strategy

The implementation and maintenance of a strategy to counter the fiscal risks of natural disaster 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$111.8B (US$745M) or cumulatively 18.7% of GDP (Climate Change Policy Framework for Jamaica, 2015). The mean annual temperature for Jamaica is projected to increase between 1.1 °C and 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 Strategy to improve the capacity of the government 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 on the country.

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 of Jamaica (GOJ) 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 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 layers 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, with 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 such 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 commitment and 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 qualified and technically savvy 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 all across the Region.

Based on the experience of the GOJ 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. In order to achieve macro-fiscal goals, minimize impacts on the GDP, and correct for economic impacts from natural disasters and other risks (such as the COVID-19 pandemic) 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 socio-economic value at risk and investments in the context of Nationally Determined Contributions (NDCs) and resilience building. This approach could be useful for other Ministries of Finance.

Source: Prepared by the Jamaican Ministry 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.

Ministries of Finance should seek to develop comprehensive risk finance and insurance strategies, as part of broader sustainable finance efforts. They should take 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 assessment 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, requiring the establishment of a supportive legislative and regulatory framework.

Function 3e. Leveraging international climate finance and the global financial architecture

Getting climate finance 'ready' and leveraging MDB and DFI capital[33]

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).

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 US$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 have a strong global public good nature. About three-quarters of the IMF's membership will be eligible.

Similarly, international and bilateral official development assistance (ODA) worth over US$179 billion globally(OECD, 2021b) **can be used by Ministries of Finance to support global and local public**

[33] We are cognisant that the state of the evidence in this area is in considerable flux and that this section will need to be updated as the state of the art evolves, especially in relation to MDB reform and going beyond the $100 billion.

goods, including climate mitigation, adaptation, and resilience investments, specifically in poor and vulnerable countries. It can help to cover some of the upfront costs of the low-carbon transition, including supporting a just transition (and avoiding a disorderly one). And ODA can help both lower the cost and de-risk sustainable infrastructure projects.

Ministries of Finance from certain countries are major shareholders in the MDBs, including regional development banks, and can call for enhanced support for climate action. As shareholders, Ministries of Finance can support proactive capital increases for facilities such as the International Development Association, Climate Innovation Fund, and Global Innovation Fund, as well as regional development banks such as the African Development Bank (AfDB), Asian Development Bank (ADB) and Inter-American Development Bank (IDB). They can encourage 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 turning over assets faster. They can support efforts to extend Special Drawing Rights which can assist countries in opening up fiscal space. And they can encourage 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, 2022). One calculation suggests the major MDBs could raise lending by US$750 billion with no change in credit rating (Humphrey, 2022). Shareholders and other countries can also continue to encourage an increase in international climate finance, especially concessional finance and finance for adaptation investments. This will ensure that ambitious development and climate transition programs are not blocked because of a lack of financing.

It is worth noting that the new Sharm el-Sheikh Implementation Plan from COP27 provides for consideration of the design of a new funding mechanism to support climate vulnerable countries cover the costs of loss and damage, including through mobilizing new and additional funds. This process will be complete by COP28.

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 and DFIs. Being 'climate finance ready' refers to the ability to access, allocate, distribute, and make use of financial resources for climate action, as well as the monitoring and reporting of its use and results. Combined with often challenging MDB and bilateral donor access requirements and a 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 to action (Gogoi and Venkatramani, 2021).

- 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. Ideally, these should be capable of blending multiple sources of finance (see Function 3c). Many countries use national development banks for this purpose.

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) is the central financing agency for development in Brazil. BNDES 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). Similarly, Nacional Financiera (naFin) is the principal financial agent of the Mexican federal government for negotiating and obtaining lines of credit from the World Bank and IDB and orchestrates support for many programs supported by international climate finance, including: the Mexican Forest Fund (FFM), which provides payment for environmental services; the Mexican Carbon Fund (FoMeCar), which promotes the development and use of low-carbon-emission technologies; the trust fund for electric energy savings (Fide), which promotes efficiency; and support services for agricultural Marketing (aserCa), which work to liberalize markets and channel financial resources directly to producers (Griffith-Jones et al., 2020; The Nature Conservancy, 2012).

The **Rwanda Green Fund,** FONERWA, was launched in 2012 as the principal financial vehicle for Rwanda's climate finance efforts. Since its establishment, FONERWA has mobilized US$216 million in domestic and international finance, most of which has gone to mitigation. One of the greatest challenges to the Ministry's program so far has been mobilizing private sector finance into the climate space alongside international capital. Recognizing this, Rwanda held capacity-building training and private sector outreach efforts in 2018 and 2020 to provide a space for ongoing dialogue and promote climate action by the Rwandan private sector.

Accessing voluntary capital markets

Context and role of Ministries of Finance

Voluntary carbon markets represent a potential innovative source of debt-free finance for decarbonization, especially for emerging markets and low-income countries (Bhattacharya et al., 2021). 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—including through private standards or via the mechanisms established by the Paris Agreement's Article 6—so finance can flow to private actors or supplement public budgets. Low-income and middle-income countries could benefit from finance for actions like integrated forest management, deploying clean cookstoves, or decommissioning coal power plants. Furthermore, high-quality carbon credits can also advance other SDGs, through providing co-benefits for other goals like biodiversity or local economic development.

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, wider safeguards (Florini and LaForge, 2021; 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. Strong

ownership and involvement of impacted communities, including indigenous and vulnerable groups, is especially important. Technical capacity is also needed to develop an approach to carbon markets that is embedded in governments' wider strategies and development priorities. There is a potential trade-off between credit sales and Paris implementation: when buyers demand a 'corresponding adjustment', host country governments will no longer be able to count emissions savings towards their NDCs. Policymakers in some countries—including India and Indonesia—have ruled out some or all exports of carbon credits owing to concerns that transferring savings abroad will hinder national decarbonization efforts. Finance Ministries should be especially cognizant of the live debates concerning the use of voluntary carbon markets, with an emerging view that carbon offsets should only form a small proportion of public and private climate commitments (with a focus on less 'net,' and more 'zero'). The new science-based net zero standard recommends that carbon credits are only considered as an option for neutralizing residual emissions or to finance additional climate mitigation beyond their science-based emission reduction targets (SBTi, 2021).

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 play a role in taking responsibility for incorporating high-integrity standards for carbon credit issuance and use in sustainable financing in partnership with regulators. In addition, monitoring, reporting and verification are key building blocks that Ministries of Finance should support—through funding internal government capacity, such as for development of REDD+ action plans and accounting tools as well as fostering a strong ecosystem of domestic and international market players (UNDP, 2021).

Real world examples

Several countries are preparing actively to access voluntary carbon markets. Countries in the **Congo Basin** are developing a harmonized framework for issuing carbon credits that could attract substantial investment for forestry activities. A leading effort that could benefit from carbon finance is in **South Africa**, which is explicitly linking coal phase-out to retraining and relocation for workers in the value chain in a 'just energy transition', with potential benefits for health and environmental rehabilitation (Blended Finance Taskforce, 2021). 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.

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 transport. 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 long-term strategies. 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 US$1 trillion annually of new private capital flows by middle of the decade in emerging markets and developing countries (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 transport, by:

- Providing a single forum for coordinating financing for Paris-compatible projects across a broad range of sources (public, private, and international).
- Addressing both 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 their 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

It can be challenging, especially in EMDCs, to establish effective country platforms. Key challenges often include: a lack of incentives for governments to take the lead; complex stakeholder coordination (including among ministries and with development partners); low technical and implementation capacity; and potential constraints to the effective involvement of the private sector (High-Level Advisory Group on Sustainable and Inclusive Recovery and Growth, forthcoming).

As a result, country platforms tend to work better when designed to deliver specific targets or objectives tied to a major government priority such as phasing out coal or use of fossil fuel vehicles. It is critical that (governments exercise ownership, lead, and have a clear vision on 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. Country ownership is critical to ensure trust and legitimacy, to encourage competition, to retain a government's flexibility to engage with the most suitable partners, and to 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 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 to US$8.5 billion over the following three to five years to advance the Partnership). This can be viewed as an early test case. Since then, the G7 and World Bank have initiated discussions to consider other potential country platforms, with **Indonesia** emerging as a new platform at COP27. Other emerging platforms that do exist 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 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 (GIF)'s Country Mobilization Platform Initiative, 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 for capital increases, stretching balance sheets, reforming lending limits, greater use of risk pooling and guarantee mechanisms, and Special Drawing Rights.

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 the costs of loss and damage, including through mobilizing new and additional funds.

Ministries of Finance should proactively consider what contribution voluntary carbon markets can make to their net zero investment plans, particularly by filling gaps in the existing landscape of climate and development finance, whilst at the same time giving special attention to the integrity of carbon credits and application of appropriate safeguards. 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 (MDBs and DFIs) to establish country investment platforms in a small number of strategic priority areas. This could be focused on ending coal use, phasing out fossil fuel vehicle use, ending deforestation, or investing in resilience. Ministries of Finance should:

- Ensure that 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 pertinence of strong government leadership.

Crosscutting: The role of Ministries of Finance in ensuring a Just Transition[34]

Introduction

A strong focus on a just transition across all action and investment areas will be crucial to ensure broad public support for the transition. Ministries of Finance need to be central to this. **For Ministries of Finance the rationale to support the just transition is twofold:**

- **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, political backlash could follow, which could risk slowing the process of decarbonization. By contrast, active anticipation of change and shaping 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 these 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, i.e., addressing the 'human capital' and 'social capital' required for net zero. But a just transition goes further, by 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.

Part B touches on many aspects of climate policy that require proactive consideration of the distributional consequences and 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 delves into the issue in further detail.

Rationale for action and role of Ministries of Finance

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. A just transition ensures a fair and wide distribution of the benefits as well as targeted support for those individuals, businesses, organizations, and regions that may be adversely impacted. Protest 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 Part B. It implies an important role in supporting key line ministries (and Labor Ministries in charge of social dialogue) in the policy appraisal process. 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 workers, communities and consumers.

To date, most countries fail to adequately take account of just transition matters. A recent report highlights that in many countries there is a growing awareness of the fact that to have the best chance of effective and lasting implementation, policies need to do this (Chan et al., 2022). Still, in most cases, the just transition elements of recent policies could be considerably stronger, and in many cases 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

[34] This section is based on contributions from Sabrina Muller (Grantham Research Institute) and Ishac Diwan, Martin Kessler and Yomna Mohei Eldin (Finance for Development Lab)

reviewed in Europe, North America and South Africa exhibiting the strongest just transition elements (ibid.).

Common themes and sectors that are especially pertinent for Ministries of Finance to consider:

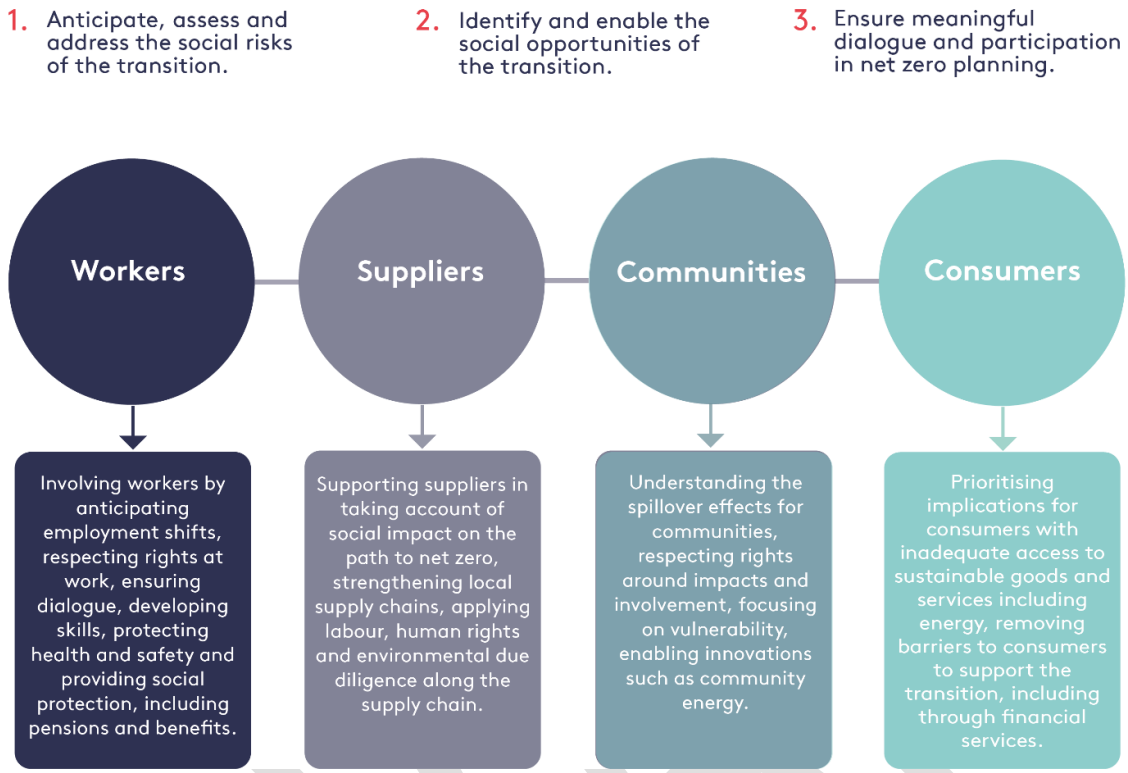
- **Managing potential job losses in impacted sectors.** The green transition could result in 6 million job losses, with 2 million of them in the fossil fuel mining and extracting industries (ILO, 2018). While these are expected to be more than offset by the creation of new green jobs and the transformation 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 creations (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 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. When global energy prices are high, they tend to be often larger than public spending on social services. Removing energy subsidies and taxing polluting sources will be critical to a green transition. Yet this can mean higher energy prices in the near term which hits vulnerable groups. 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.
- **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 they 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.** Financial standards and regulations will be crucial for driving business and finance to manage environmental risks and seize sustainability opportunities. It will be crucial that Ministries of Finance work with regulators to incorporate the just transition into financial standards and regulation, including in terms of disclosure. The multilateral and regional development banks can play an important supporting role here.

Ministries of Finance can follow a set of key principles for embedding the just transition into all climate policies and decision-making. A review of global financial sector practice suggests three key factors should be at the heart of any approach:

- **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. This is a particular priority for the needs of vulnerable and marginalized groups.
- **Integrating human rights and labor standards:** This means applying and respecting well-established social, labor and human rights standards to the net zero transition. These include the UN Guiding Principles on Business and Human Rights, International Labour Organization labor standards and the OECD Guidelines for Multinational Enterprises. Net zero needs to be science-based; the just transition needs to be rights-based. The Paris Agreement in particular emphasized the imperative of the creation of decent work and quality jobs.

- **Ensuring meaningful participation and partnership**: This means that those affected by change are included in decision-making that affects them. This can often 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 B3: Just transition factors and stakeholders to be considered in climate action



Source: Curran et al. (2022)

In addition, Ministries of Finance can advance a gender-sensitive transition by supporting women's representation and equal participation in all activities and decision-making bodies related to climate action. 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, 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.

Barriers to action and ways to overcome them

While there are growing commitments to the just transition by a range of actors and there is now common recognition of it as a key issue, practice from both the public and private sector is at early stages. Learning from practical experience will be central. Ministries of Finance can orient themselves on the examples highlighted below, which can serve as blueprints for action and can be adapted to different domestic contexts.

Some emerging barriers to fostering a just transition include:

- A lack of incorporation of just transition principles in national climate strategies. Ministries of Finance can tackle this through engagement in relevant planning processes, as well as encouraging the participation of Labor Ministries (see Function 1a).

- A lack of innovative financial solutions that address both environmental and social considerations. As outlined in Function 3b, Ministries of Finance can consider sustainability-linked bonds that link to delivery of broader social benefits.
- 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

There are emerging examples of good practice that 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 coal plants phaseout plan is a good example. In 2021, the government introduced in Parliament the groundbreaking *Canadian Net zero Emissions Accountability Act*, formally committing Canada to achieving net zero emissions by 2050. 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 into the affected regions, and to help affected workers transition towards the new job opportunities. The transition plans also included seed grants and revolving loans for businesses in the affected regions, including two measures announced in 2019: a US$150 million infrastructure fund, starting in 2020-21, to support priority projects and economic diversification in impacted communities, and over US$100 million devoted to skills training. These programs are now part of the regular budget: for example, the 2021 Budget includes a US$960-million program to create good jobs in clean energy, a US$185 million program to support the transition away from coal, and US$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).
- Other mechanisms include the Climate Investment Fund's Accelerating Coal Transition (ACT) program, which supports countries around the world to develop socioeconomic measures that aim at minimizing the impacts of transition on people and communities. This includes a central focus on upskilling and re-skilling to help people not only retain jobs where feasible, but also prepare for new jobs that become available.
- The **EU**'s Just Transition Mechanism provides a key tool to ensure that the transition towards 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 2021-2027 to alleviate the socioeconomic impact of the transition in the most affected regions.
- **South Africa's** Just Energy Transition Taskforce also provides a mix of mitigation and retraining of workers in the state utility Eskom (see also Function 3d).

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 higher ability to pay, but also because of the skew in the distribution of carbon consumption. Individuals in the global top 1%, for example, emit about 70 times as much carbon as the bottom 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). An example of utilizing carbon pricing to finance climate adaptation and mitigation is **California's** carbon cap and trade program. Revenue from the program 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 impact of climate, and to invest in climate 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. The Ministry of Finance's role in carbon taxation and investing in the just transition in Ireland

Having introduced a carbon tax in 2009, carbon pricing is a central pillar of Ireland's overall decarbonization strategy. Carbon taxes are 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 transport sectors (i.e. the non-emissions trading system [ETS] sectors), covering fuels such as kerosene, marked gas oil, liquid petroleum gas, fuel oil, natural gas and solid fuels. It is not applied to the ETS sector, where emissions are already subject to a European-wide carbon price.

This introduction of the carbon tax followed a recommendation from the 2009 Commission on Taxation report which called for phasing in fiscal measures to lower carbon emissions. 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 it should help ensure that behavioral change aspects are maximized. Initially the carbon tax applied to motor fuels at a rate of €15 per tonne of CO_2 emitted. The government has committed to progressively increase the carbon tax to reach €100 per tonne of CO_2 by 2030, with the Finance Act 2020 establishing a statutory trajectory, whereby the rate will increase by €7.50 each year. This has been important in providing a clear signal as well as 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. As income is lower, energy costs typically represent a higher proportion of overall household costs for the less well-off. 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. This means protecting the most vulnerable in society from the impacts of the tax and, where possible, ensuring they are better off than before. In 2020 the Economic Social Research Institute (ESRI) was asked to undertake analysis to determine whether the Irish 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 found that by recycling one-third of the revenue raised from a €7.50 increase in the carbon tax, the lowest income fifth of households can be left on average better-off. 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. For example, the 2022 Budget included increases in 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, since its introduction 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 for a just transition.

For 2022, carbon tax revenue of €412 million has been allocated to the following programs:

- €174 million on targeted social welfare and initiatives to prevent fuel poverty and ensure a just transition
- €202 million to part fund a national retrofitting program
- €36 million to other sectors to support programs such as the Midlands Just Transition Fund.

What are the key messages and recommendations for Ministries of Finance?

- Agreeing and publishing a schedule of increasing carbon tax rates provides regulatory and investment certainty and allows 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 hence 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 not think of net zero and a just transition as two separate goals. The just transition is not a 'nice to have' afterthought, but rather a critical enabling factor for the successful shift to net zero. There can only be one transition and it needs to be just.

Ministries of Finance have an important role to play in working with other line ministries and stakeholders in developing just transition plans and policies for all key sectors of the economy to ensure national climate strategies are politically attractive and economically beneficial for all concerned. At the heart of this should be ensuring climate policies consider potential positive and negative social impacts, and that affected stakeholders are included in decision-making.

Ministries of Finance should give particular attention to reskilling workers moving out of dirty and into green sectors; removing subsidies and impose 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 also 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).

Three capabilities to perform the three core functions

Introduction

Significant gaps in capabilities are one of the most significant barriers to climate action facing many Ministries of Finance. Capability is more than about capacity, the total volume of people, money, and other inputs. It is about translating inputs into outputs and outcomes through sustained leadership, clear roles and responsibilities internally and with other government departments, strong internal coordination and information-sharing, and strengthening skills and human resources (ODI, 2016; World Bank, 2013).

The three capabilities which impact the ability of Ministries of Finance to fulfil their core functions are:

- **Capability 1: Strengthening leadership for climate action** through a revamped vision, mission, and mandate and institutional set-up for climate action to provide strategic clarity on the direction of travel *(HP2)*
    - **1a: Strengthening the mandate** of Ministries of Finance
    - **1b: Developing organizational climate strategies**
    - **1c: Formalizing governance structures and organizational set-up**
- **Capability 2: Enhancing collaboration and coordination** within and outside government for a whole-of-economy approach to climate action *(HP2)*
- **Capability 3: Building human capacity, expertise and economic decision-making tools** for climate action *(HP2 and HP4)*
    - **3a: Enhancing skills and expertise** of ministerial staff
    - **3b: Enhancing economic decision-making tools and data-driven analysis** to inform decision-making

Capability 1. Leadership and governance for driving climate action

[Helsinki Principle 2]

Perhaps the most significant capability Ministries of Finance need to build relates to leadership. Addressing climate change involves transformation across all sectors of the economy. Without sustained leadership by Ministries of Finance, this transformation will not be possible because climate change action will not be prioritized and mainstreamed in their work.

This section touches on all facets of leadership but pays particular attention to:

- **Capability 1a: Strengthening the mandate** of Ministries of Finance on climate change.
- **Capability 1b: Organization-wide strategies** for climate action and revamped governance.
- **Capability 1c: The institutional set-up** to enable Ministries of Finance climate leadership.

Introduction: Strong leadership for climate action

Addressing climate change involves fundamental transformation across all key sectors of the economy. This will not only require Ministries of Finance to consider how to enhance their core functions but that they underpin this with sustained political and technical leadership. As outlined in Part A, in times of crisis Ministries of Finance have been able to act with flexibility and speed, providing that the crisis is a clear political priority. They can and must respond to the climate crisis in a similarly flexible and nimble way. This requires leadership at all levels—political and technical—backed up by strong and progressive governance structures.

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 developing 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 developed country

Leadership by Ministries of Finance needs to be supported by effective internal institutional arrangements and dedicated expertise (covered further in Capability 3). This requires staff with relevant subject matter expertise, the responsibilities to be able to demonstrate leadership, and clear mechanisms and responsibilities for internal and external collaboration and coordination. Achieving these objectives needs leadership and commitment by Ministers of Finance and senior officials in order to ensure the sufficient allocation of internal resources. A clear institutional set-up with the requisite staff capacity is especially important to be able to deliver policy assessments and design policy options for government decision-makers at the scale and speed required.

The importance of this point 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 upper-middle income country

Barriers to action and strategies to overcome them

Ministries of Finance typically face several barriers that make fulfilling their climate leadership role an especially challenging task. These include:

- **Lack of commitment to climate change objectives** at the senior management level combined with a lack of an 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 European country

- **Lack of clarity on the overall mandate of the Ministry of Finance**. While the overall political support for climate action might be in place in certain countries, challenges arise with the implementation of the political commitment due to the lack of a more explicit mandate for the Ministry of Finance 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 core responsibilities necessary to drive change, unless this is explicitly recognized it is difficult to secure internal commitment of resources (human and financial) and it causes delays to the creation of internal capacity. This can then unleash a vicious cycle.
- **Competing (or perceived competing) priorities tend to push climate change to the background,** which makes it challenging to maintain climate as a priority area that requires investment of resources. Various current crises directly impact on climate action: for example, the financial crisis, COVID-19 pandemic, the invasion of Ukraine, the food and energy crisis, poverty alleviation, and the cost-of-living crisis. Some governments told us in our interviews that they have had to take difficult decisions to ensure the short-term needs of stopping inflation and protecting vulnerable social groups against the rising prices of goods and energy are met. They acknowledge that some measures, such as discounts in fuel or short-term subsidies for energy-intensive industries, may contradict climate objectives. Nevertheless, they find 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 (e.g., due to there being no clear designation of responsibilities), may make collaboration and coordination more challenging and potentially affect credibility of the Ministry on climate change matters.

These barriers are not easy to address, particularly those that require additional resources. However, there are various steps that Ministries of Finance (particularly senior officials) can take,

including clarifying their mandate, developing an internal (organization-wide) strategy on climate change, and assessing the required and available capacity internally and through external collaborations.

However, there is unlikely to be any substitute for clear political leadership by Ministers of Finance. Experience demonstrates that Ministries of Finance, especially those in higher capacity contexts, are able to act with flexibility and speed in times of crisis, providing that the crisis is a clear political priority. Moreover, as outlined in Box B13 below, several countries interviewed for this report noted that change in their commitment to climate change occurred after the change of the government or following an appointment of a new Minister who exercised personal leadership in bringing climate onto the Ministry's agenda. Senior officials can play an important role in cultivating this 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 overcome these barriers to action to galvanize enhanced leadership capability on climate.

Capability 1a. Strengthening the mandate of Ministries of Finance

Nature of the problem and rationale for action

It is usually helpful for the Ministry of Finance to develop an explicit mandate and strategy for driving climate action to drive enhanced collaboration with other agencies and to mobilize capacity internally. 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. 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 country highly vulnerable to climate change

Having a clear mandate on climate change can help enable Ministries of Finance to get 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 towards net zero. If the Ministry of Finance lacks clarity on its position or its mandate on climate action, then 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, which is necessary to drive action at the pace and scale required and to enable and empower other agencies through fiscal policy and the budget.

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. As outlined in further detail below, the Ministry of Finance in **Denmark** updated its mission statement to include climate and the environment as a top-level objective, which has driven its ability to exercise climate leadership. Similarly, **Finland's** Ministry of Finance has sometimes struggled to proactively address climate change due to the lack of a clear role in the national climate governance. While the Ministry has been involved in climate policy through taxation and the budget process, it is not a member of the government's

Climate and Energy Policy Group led by the Minister of Environment. In December 2022, the Ministry will adopt its climate and nature strategy, communicating the Ministry of Finance's 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 core part of the Ministry's activities in the future.

A mandate on climate change for the Ministry of Finance could come from legislation or from the Government's program. It can also be initiated by the leadership of the Ministry through an internal strategy on climate change. However, the latter might not be sufficient to formalize the Ministry's role and obligations as part of the overall climate governance. , In the face of competing priorities due the current series of 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 of increased leadership by Ministries of Finance on climate change

Several countries interviewed for this report noted that change in their commitment to climate change in the Ministry of Finance occurred after the change of the government or a shift in the current government's approach to climate change; adoption of legislation; or following 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, as well as 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 that among others sets sectoral goals, shifted the debate. The climate law sets national and sectoral goals for every year reviewed and if the national and sectoral goals are not met, the government is obliged by law to 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 the climate objectives.

In the **UK**, the government's Net Zero Review is an analytical report that 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 when designing decarbonization. It also highlights some of the fiscal risks from inaction and begins to consider climate in a framework that is about managing fiscal risk over time and trying to secure 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 the 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 and build back. 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 the Ministry's core mandate on climate change:** changes to the mandate of the Ministry of Finance to include climate-related issues have either happened top-down, following an adoption of a climate law (e.g. **Denmark**), or 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 happened due to personal leadership by the Minister of Finance (e.g., **Malaysia**).

- The mandate for the Ministry of Finance in **Uruguay** 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.
- **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.[35]
- The Ministry of Finance in **Denmark** has updated its mission statement that sets the overall strategic direction of the activities to include sustainable climate and environmental development as a top-level objective alongside fiscal and economic priorities (see Box B14 below).

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." (Danish newspaper Berlingske, 19 Oct 2020)

Several concrete initiatives in the Ministry of Finance followed this top-level political direction:

The mission statement which 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 (changes 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 and sustainable climate and environmental development.****"*

For more detail on the related governance changes implemented in Denmark to fulfil 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

Nature of the problem and rationale for action

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

[35] Some case studies provided by Molly Caldwell and Natalia Alayza (WRI)

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, efforts need to be made to ensure the plan is aligned with and reflected in the Ministry's overall priorities.

Formalizing and publishing a climate strategy can serve several purposes, including:

- Laying 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 key elements presented in Table C1.

Table C1. Key elements to consider in Ministry of Finance internal strategies on climate change

Element of strategy	Relevant consideration on content
Overall vision on climate change	Should Include the 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	Should highlight the key challenges and opportunities of climate action.
Strategic priorities and desired outcomes	Should be accompanied by the list of actions and measurable indicators of success.
Overview of relevant stakeholders	Should consider stakeholders both inside and outside government, and outlines how coordination is to be carried out and who will be responsible at the Ministry.
Assessment of capacity and resourcing needs and plan to meet them	Should include an assessment of required and existing skills and capacity gaps; and identifies a plan for augmenting capacity (see Capability 3).
Internal governance or institutional arrangements	Should determine how capacity to address climate change would be organized and where it would be located internally; and identifies mechanisms for internal and external collaboration.

Source: Authors' compilation

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 towards reducing those impacts. Efforts should include measures such as increasing the use of renewable energy, using electric vehicles and 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). The 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 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.

- One of the **Irish** Department of Finance's Statement of Strategy 2021-2023 five strategic goals 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, as well as accompanying outcomes and performance measures.
- 'Navigating climate change' is one of the strategic priorities outlined in the **New Zealand** Treasury's Strategic Intention 2021-2025.
- The latest strategy of the **Finnish** Ministry of Finance, published in March 2022, titled The Ministry of Finance secures future prosperity, defines the Ministry's 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 started working on a dedicated climate and nature strategy which will be published in December 2022. It will communicate the Ministry of Finance's responsibilities and which principles it will emphasize when preparing climate and nature policies.

Some Ministries of Finance already have dedicated climate strategies that provide more detail on priorities and planned activities.

- **Chile**'s Financial Strategy on Climate was published in 2019. It highlights the role of the Ministry in the national climate agenda and sets out an action framework consisting of three pillars that aim to "contribute to the implementation of climate and sustainable development objectives as defined by the Paris Agreement through Chile's NDC, with a view to carbon neutrality". The three pillars are 1) information, generation and analysis of under coherent framework to mobilize capital flows; 2) promotion of economic and financial instruments and market development; and 3) strengthening green finance in the financial sector. Under each pillar, the strategy outlines progress to date and short-term priorities for action. It also discusses the role of the Ministry of Finance in the broader climate governance structure.
- The **US Treasury** has both 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's 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 resiliency 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 to increase climate change knowledge and expertise among the department's 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

Nature of the problem and rationale for action

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. Depending on the available resources and the mandate of the Ministry of Finance, different institutional approaches are emerging in this respect. 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 (e.g., see examples of Ireland, Fiji and Denmark below). Some countries take a hybrid approach of creating a small climate change team, which coordinates engagement of relevant expertise across the Ministry of Finance (e.g., the US Climate Hub).

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 of Finance. Addressing climate change should not be an optional add-on to the full set of the existing duties but be part of the core responsibilities of the designated staff and reflected in the plans of work and performance reviews. Designating responsibility over climate change improves institutional clarity and continuity and enables commitment of resources in the Ministries of Finance.

Effective processes for internal and external collaboration on climate change in the Ministries of Finance are essential to tap into relevant expertise and knowledge distributed among many internal teams and external institutions and stakeholders. For instance, Germany 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 more detail). 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 experiences 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 contributed to creating internal capacity, increased overall awareness among staff and enabled better coordination and more effective responses to climate change: [36]

- **Denmark's** Ministry of Finance set up new a dedicated Centre for Climate, Green Economy and the EU by merging several existing teams and adding additional staff. 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).

[36] Some of these case studies have been provided by Natalia Alayza and Molly Caldwell (WR).

- In 2011, as part of the institutional efforts toward increasing climate finance, **India** created the Climate Change Finance Unit within the Department of Economic Affairs of the Ministry of Finance. The primary purpose of this unit is to serve as the focal point of the Ministry on all matters related to climate finance, participate in international negotiations, and provide technical inputs to the national climate policy framework.
- In **Ireland** the Department of Finance established a dedicated Climate Unit in 2020. This happened 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. Since the establishment of the unit, climate issues are increasingly mainstreamed across the Finance policy areas. The unit provides strategic oversight of climate action. It has coordinated the input into the national Climate Action Plan towards achieving the legally binding target of reducing greenhouse gas emissions by 51% relative to 2018, and more recently the first program of carbon budgets and related sectoral emissions ceilings. This unit is set to manage engagement with and input into the update of the Climate Action Plan as required under the Climate Act. In addition, and with the view of building engagement across the Department, in 2022 the unit set up at a senior level (management board) an internal Climate Economy Group which has an important role in improving climate-related policy development within the Department. This is assisting in increasing awareness and capacity on climate issues across the various policy areas.
- The Ministry of Finance in **Chile** has been working on green finance for several years; as the work has intensified the internal structure has been transformed. In 2022, the Ministry established the Green Finance Unit as a dedicated unit to drive and coordinate efforts. The unit is in charge of: driving investments into green assets; promoting national financial innovation to support the sustainable development trajectory, low carbon emissions, and strong resilience to climate change; advising other government agencies on matters related to sustainable development and climate finance, mitigation and adaptation instruments and other issues related to sustainable finance; relationships with multilateral agencies, organizations and institutions in the areas of sustainable development and climate finance. As a result, coordination on sustainable finance issues internally and with other agencies has been improved. Chile has become the first country to issue 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. This unit is anticipated to coordinate the Ministry's climate actions and liaison with other government ministries and agencies. The unit will host the different climate-related analysis tools that will be used by the departments within the Ministry of Finance and other agencies. It will also aim to explore financing possibilities to ensure climate strategies are reflected in the national planning frameworks and budgets. The unit will also continue with efforts to reduce the cost of climate financing; for instance, the initiative of having intermediary agencies removed from the climate financing modality, as being piloted under the LDC Initiative for Effective Adaptation and Resilience.

Box B15. Creating capacity to address climate change in the Ministry of Finance in Denmark

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 and 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 on improving guidance on climate aspects socioeconomic policy impact assessment as well as the development of Denmark's 'energy islands'—large-scale offshore wind projects. The Centre for Macroeconomic Policy delivered the foundation for a political decision to create a dedicated green fiscal space of more than €7 billion towards 2040 reserved for green public investment.

Using external experts to develop policy input. The Danish government established two commissions of external experts tasked with providing analysis and developing 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. Having the secretariat function based in the Ministry of Finance helped build up internal insight and capacity on key issues as well as successfully negotiating political agreements based on the commissions' proposals.

Source: Prepared by the Danish Ministry of Finance

Despite creating dedicated teams working on climate change in the Ministries of Finance, many such teams are rather 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 have (around 25 and 8 to 10 staff, respectively). The Department of Finance in Ireland is supported by about five staff primarily working on climate change, while several hundred staff work in the department as a whole. Coordination with the rest of the ministry becomes a critical challenge but also an imperative to deliver on the climate agenda.

As an alternative to establishing a dedicated unit, a hybrid approach can be used where a designated small team coordinates work on climate change, but a large bulk of the work is done within the existing teams.

- Such an approach has been implemented in the **US** Treasury, which created 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. To accomplish its mission, 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 by various directorates. However, it was deemed necessary to have a focal point to coordinate all the environmental and climate-related affairs, and to provide technical assistance in these areas. 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, and the design of policy guidelines related to the protection and management of the quality of the environment, as well as mitigation and adaptation to climate change. The MEF did not create a specific climate change unit but instead added relevant functions to an existing department and hired specialized staff. DGAEICYP is the focal point for all

environmental affairs at the national and international level, as well as the national designated authority to the Green Climate Fund.[37]

Box B16. Fiji's Ministry of Economy driving climate action: successes and challenges

Creating capacity. In 2017, as Fiji started to recover from 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 as the Climate Change and International Cooperation Division (CCICD). The restructuring embedded climate considerations into decisions about economic policy, budget planning and allocation, and international assistance.

Institutional challenges. All governing institutions in Fiji face limited expertise, staffing capacity, and technological prowess. These capacity constraints also extended to the early days of the CCICD. Half of the division has almost as many climate-focused embedded consultants (10 external consultants) as it has full-time staff (12). The 12 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—many of whom have their own teams at least as big as the CCICD. Most of the staff are recent graduates who move on to other jobs within five years—often to the international development partners—meaning the entire team turns over within the same timeframe. This hinders the institutionalization of the knowledge and processes the team develops. Although the CCICD is routinely under-resourced, it has more climate expertise and dedicated staff capacity than its potential counterparts at the line ministries. The Climate Change Act calls for the sector ministries to establish a climate focal point to liaise with the CCICD on all climate-related issues. At the time of writing, four of the 18 sector ministries had formally established this focal point.

Key achievements

The CCCID 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 conversations 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 the 2022-23 financial year. The goal of the issuance is to catalyze a COVID-19 recovery that reignites Fiji's fisheries sector, advances low-emissions shipping and marine transport, 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 five critical climate-related outcomes: 1) providing for the relocation of at-risk communities and safeguard their rights, 2) setting a net zero emissions target for 2050, 3) setting the legal framework to enable carbon sequestration, carbon stocks and emissions 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 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)

[37] Case study provided by Natalia Alayza and Molly Caldwell (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 a 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 the 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 the climate change objectives and outlining a plan in how they will be built internally and through external partnerships.
- Make 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 the issues related to climate change, decarbonization, and climate resilience.
  - Where resources permit, establishing dedicated climate change units combining redeployment of existing staff and recruitment of new experts. Alternatively designating a small team dedicated to coordinating work on climate change, with a large bulk of work being done within the 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 the government and to the external stakeholders and general public accordingly.

Box B17. Delivering through a small Climate Hub at the US Department of Treasury

In April 2021, 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. Since its creation, the Climate 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 worked with teams across the 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 an inherently

cross-cutting challenge, the Climate Hub collaborates with Treasury's policy offices to maximize synergies and 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 but not limited to: climate finance negotiations; multilateral development bank climate policy; environmental trust fund oversight; Just Energy Transition Partnerships; multilateral forums such as the G7, G20, FSB, 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 included 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 also is charged with procuring electric vehicles 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-Department 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]

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 by nature horizontal, cover all sectors of the economy, and nearly always come 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 (Naby, 2019). Climate change is a 'wicked issue' affecting a range of government functions across sectors and industries, requiring that climate policymaking must be coordinated across departments and levels of authority aligning efforts to accomplish national climate goals (Pollitt, 2015).

Cooperative and coordinative efforts are key tools for solving such complex policy challenges, such as climate change (O'Leary and Blomgren Bingham, 2009). A unified response is required to address the complex, cross-sectoral, and interdependent issue of climate change that demands coordination across multiple levels of government as well as with other stakeholders like NGOs, central banks, financial institutions, and the private sector. In this context coordination refers to the extent to which a department or another institutional unit attempts to ensure that its activities consider what other departments are doing. Cooperation represents willingness to work together (Singh, 1991).

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 F3a). This role can be utilized to strengthen government coordination and cooperation on climate challenges.

Effective climate coordination is crucial in achieving 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, to identify and bridge potential policy gaps, and to improve buy-in from sectoral line agencies into the climate change objectives and key policies. It also enables relevant expertise spread across the 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 a developing country Ministry of Finance official

Coordination and collaboration with non-governmental stakeholders, such as civil society, the private sector, and the international finance and expert community, is critical for improving the quality of and support for the policy proposals. It can also help fill internal knowledge and capacity gaps at the Ministries of Finance (as discussed in Section C3 in more detail). Such coordination and collaboration can happen, among other ways, through consultations on policy design and input on policy proposals, knowledge development partnerships and joint pilot projects.

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 is 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 key strategic documents setting the economic development agenda. This can create a systemic issue with lack of alignment and policy coherence. Many current policies by national governments 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 the mandates or work plans creates potential institutional conflicts about which institution would be entitled to make decisions. It is important to have clarity on who oversees each thematic area, what the specific mandate of the Ministry of Finance is and how the relationship would be managed, as well as what happens if various bodies or committees disagree (see Capability 1).
- **The Ministry of Finance is 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 part of or is not an active member of the inter-ministerial coordination mechanism on climate change. Often the Ministry of Finance is not a central player but is a 'gatekeeper', as it signs off on the budget and financial matters. For example, in Finland, up until recently the Ministry of Finance was part of the ministerial group that prepares national climate scenarios but was not a member of the inter-ministerial group working on climate strategy.

  "*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 of Ministry of Finance specialist from an upper-middle income country
- **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 horizontally 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 as well as delays in necessary responses.
- **Insufficient priority and resource given to coordination on climate change** either by the Ministry of Finance or the line departments impedes meaningful interaction and inputs: this results in a

lack of ownership over the policy proposals and causes detrimental impact to their quality. These challenges may stem from the lack of commitment among the leadership of the relevant department and/or lack of clear institutional mandate on climate change. Furthermore, limited internal capacities of the Ministry and lack of designated focal point for coordination can be at play (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 makes an assessment of 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 in a situation of having disparate approaches in different sectors. This creates challenges for financing: for example, if the government wanted to issue a green infrastructure bond, there is no single set of documents that takes into consideration how the government approaches the issue of climate change and sustainable finance.

Many coordination challenges can be addressed through clarifying the respective mandates among the agencies and adapting the mandate of the Ministry of Finance to include climate action. Related to this, 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 (see Capability 1 for more detail and examples). 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 as well as long-term strategies. A mandate for Ministries of Finance, Ministries of Environment, and other key line ministries to integrate climate change into NDPs and collaborate with other stakeholders may be added to each ministry's performance objectives and monitoring system. This can help to create a sense of ownership by 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 (Antwi-Agyei et al., 2018); this is achieved through mutual coordination of institutional and national coordinating bodies to avoid misalignment across sectors (ibid.).

Having a clear role for and active participation of the Ministries 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 in this context given the fact that they have key economic and political tools at their disposal, such as the budget.

Collaboration among the Ministry of Finance, line ministries and other stakeholders also helps maximize mutual capacities and build on joint expertise. Given the limited capacities of each line ministry and the cross-cutting nature of climate change, working together enables a tapping into expertise of other ministries and other financial institutions, e.g., national banks, which have strong sustainability teams (see Capability 3 for a more detailed discussion of capacities).

Feedback mechanisms should be introduced into the 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 the next steps. This improves transparency and accountability of the coordination process and builds trust among the stakeholders that their input is at least 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 for 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 specialist from a developing country

Developing collaborative relationships between Ministries of Finance, Ministries of Environment, Ministries of Planning, and other key line ministries requires special effort and should be among the priorities. This is discussed in Box B18.

Box B18: Lessons for collaboration between Ministries of Finance, Environment, Planning, 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** (where relevant) have a powerful role in defining medium-term economic policy and investment priorities.

Yet 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 on climate, 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—perceived or real, a lack of coordination and a lack of a common 'language' and objectives. While Ministries of Environment often operate on a value-based agenda, e.g., focused on long-term environmental gains, 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 working on developing economic analysis and incentives for tackling climate-related issues. Ministries of Finance are often brought late into processes, only being consulted at the end, rather than being involved in relevant processes from the beginning. On the other hand, some Ministries of Environment find that Ministries of Finance do not want to engage in processes until they discuss money—which is often in the later stages of proposal development processes—and they lack continuity of engagement. This leads to situations where Ministries of Finance are perceived by Ministries of Environment as blockers of climate policy proposals. Ministries' of Finance limited involvement in the first round of NDCs has led to several climate plans that failed 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 therefore be a priority action for Ministries of Finance, alongside other major Ministries such as Energy, Transport, Water, Industry, and Housing. Formal inter-agency collaboration mechanisms in which both Ministries participate are key to establishing sustainable modes of collaboration (as discussed in this section).

As has been 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).

In addition to building up or strengthening formal inter-agency collaboration, there are several other steps that Ministries of Finance can take to improve collaboration with line ministries:

- **Adapt the Ministry of Finance mandate** to explicitly include climate action and **develop an internal climate change strategy** (Capabilities C2 and C3). 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.
- **Establish dedicated focal points** in the Ministry of Finance and relevant line ministries, so that staff have clear points of contact.
- **Ensure early communication and information sharing and continuity of engagement:** In one country interviewed for this report, Ministry of Finance officials hold regular (weekly) exchanges with their counterpart in the Environment Ministry. This ensures that each department is aware of the work happening in the other department, and potential disagreements can be scoped early and escalated if necessary. It also allows for working relationships to be built between ministries. Similarly, another interviewee noted that that it is key to "bring other ministries to the table as soon as possible even though we may think internally that they may not have anything to add at that point".
- **Recognizing their mutual differences in backgrounds, relative strengths and constraints:** During interviews, Ministry of Finance officials noted that they have more internal capacity and expertise to work on economic issues and have an easier time to get senior support for their ideas as staff are predominately economists. In turn, staff at the Ministries of Environment come from more diverse backgrounds, and are often not economists, which makes it more difficult to get internal support for the proposals focused on economic incentives. Recognizing their mutual differences in backgrounds 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:** These can be used to share latest developments on the relevant policy instruments or learning from past projects, to bridge potential differences in expertise and learn from each other, which can facilitate future joint work.

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 an upper-middle income 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 change's multi-sectoral impacts and acknowledgement that it poses a significant threat to economic development and human security have resulted in climate policy being seen as a multi-stakeholder agenda. When NAPs and NDCs became a core part of policy, Ministries of Finance started participating more actively as members of taskforces and stakeholder consultations. In several countries, Ministries of Finance are members of the NAP preparation committee. 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. [38]
- **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

[38] Case studies on the Arab States, Sudan and Jordan were contributed by Sujala Pant (UNDP).

- **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** President Biden's 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).
- **Denmark** has three government committees that are involved in the key policy decisions. The Ministry of Finance takes part either as a member or a chair. Any policies of broader economic significance must go through the Economic Committee, a key policymaking committee that the Ministry of Finance chairs. Thus, the Ministry of Finance has always had a large role in policy coordination and has been the gatekeeper and quality assurance checker of any policy submissions going to the government (see Box B20 on Denmark for more details).
- 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 LTSs and the NDC.

Box B19. The role of the Ugandan Ministry of Finance in the coordination of 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 of 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.

Furthermore, 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 (FY2020/21 to FY2024/25), which included a chapter on climate change. It is aimed at supporting alignment of the country's Green Growth Strategy, NDCs and other national climate policies with national development priorities to ensure effective budget allocation and subsequent implementation.

The Ministry of Finance has also been essential in ensuring climate change is institutionalized into the national Public Finance 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, which can be used to respond to natural disasters and extreme events and can be leveraged to support adaptation policies. The Green Growth Strategy has fostered strategic policy reforms like greening the procurement system to ensure sustainability of government expenditure by integrating social, environmental, and economic dimensions into the 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 is anticipated to 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, cross-cutting 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 the key sectors. This is especially important when designing major fiscal incentives for key sectors, as outlined in Function 2. 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 on which projects to award tax benefits.

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 Ministry of Finance, which develops measures in collaboration with the Ministry of Climate Action.

Many Ministries of Finance are developing their own coordination mechanisms and/or participating in the existing coordination mechanisms with other stakeholders, including the private sector, civil society and arm's length agencies. Examples include:

- The Ministry of Finance in **Chile** 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).
- The Ministry of Finance in **Ireland** 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.
- The Ministry of Finance of **Uruguay**, together with the central bank and with support from the IDB, 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 in the decisions of market agents.

Box B20. The role of the Ministry of Finance in Denmark in coordination of 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 with significant economic or fiscal consequences. Furthermore, 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 cross-cutting climate policy proposals. Given that the climate policy effort needed to meet Denmark's 2030 emissions reduction target requires a mix of significant public investments, 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 particularly, 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, as well as 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 of Finance 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, as well as the 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 the 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. This can be done, for example, through working groups, round tables, 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. Coordination on green finance strategy with other actors by the Ministry of Finance of Chile

The Ministry of Finance in Chile is part of the monthly **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 as well as 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 Taxonomy Roadmap for Chile towards consolidating green finance, published in 2021.

Following the recommendations in the roadmap, the Ministry of Finance has established 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 Administrator Regulator, and the Central Bank of Chile as well as the Ministry of Finance; and is supported by the IDB with CBI. This future 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 also 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 Principle 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 therefore discusses:

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

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). Currently, many Ministries of Finance are struggling with four key skills and capacity challenges that prevent them from more proactively driving climate action (ibid., Interviews for this report):

- **Limited awareness on 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. 43% of respondents in a recent survey by the Coalition of Finance Ministers noted that their Ministries of Finance did not have sufficient capacity to develop and implement a climate change strategy, and most reported having plans to increase the Ministry's capacity in this area
- **Significant skills gaps.** Ministries of Finance lack both more general climate and economics-related skills, and staff with relevant subject expertise, such as on green finance or green budgeting.
- **Lack of tools and models.** The use, development of, and access to tools needed to inform high-quality decision-making deserves special attention and is discussed in detail in Capability 3b.

Ministries of Finance will need to develop and utilize new skills and expertise to fulfil the responsibilities arising in response to climate change. While the exact skills required will depend on each Ministry's responsibilities and priorities, a basic understanding of the latest climate science as well as climate 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 specific skills around 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 cross-cutting expertise, such as the sectoral knowledge needed to be able to understand the challenges and investments in key economic sectors. Table C2 provides an overview of the required skills and expertise that Ministries of Finance should look to hire or to upskill their existing staff in.

There are several measures Ministries of Finance can take to expand their skills and expertise. Ministries of Finance should take care to focus not only on creating personal capacity by training individual staff, but also on increasing long-term institutional capacities. 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.

Training staff on climate issues is critical for developing the necessary in-house expertise, yet so far, most Ministries of Finance have invested little in this training. According to the Helsinki Principle 2 survey, only four Ministries offer training in climate-related issues (Coalition of Finance Ministers for Climate Action, 2022g). When it comes to training their staff on climate, Ministries of Finance need to give particular attention to two dimensions:

1. **The need for dedicated staff working directly on climate change topics to acquire some blend of both specialist and cross-cutting skills**, depending on the size and priorities of the cadre working on climate issues (see Table C2). Depending on their size and capacity, Ministries of Finance can either build dedicated in-house training programs and/or rely on the growing number of training programs offered online or in person by international institutions or 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).
2. **The need for all ministerial staff 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 can for instance be done by integrating climate into general Ministry of Finance training courses, or designing a dedicated climate training for all staff, as the US Treasury is doing.

Table C2. Overview of climate action skills needed in a Ministry of Finance fit for the 21st century

Essential skills and expertise [training opportunities to be added]	
Cross-cutting - Fundamentals of climate science - Climate economics - Risk management - Sectoral expertise - Climate law	**Raising, blending and steering finance** - Green financial markets and instruments (incl. debt and bond instruments) - Mobilizing and accessing climate finance - Green infrastructure financing - Understanding of SOEs, SWFs, and NDBs - MDB and DFI policies and strategies
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	**Just transition** - Socioeconomic and regional development - Social security systems and reforms - Mainstreaming gender into climate planning
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	**Decision-making tools and models** - Macroeconomic tools - Climate-economy models - Sector models - Policy and project appraisal tools
Taxation, debt and budget management - Macroeconomic analysis of climate change - Green fiscal policy (including application in key sectors)	

- Fiscal risk management - Carbon taxation and pricing, subsidy reform - Green budget planning and reporting - Greening public financial management - Greening public investment management - Green public procurement - Analysis of carbon tax and green taxes - Environmental policy evaluation	

Source: Prepared by the authors

As Ministries' of Finance responsibilities on climate grow, expanding the number of staff working on climate will be equally important for Ministries to be able to play a more proactive role. Many Ministries of Finance have in recent years substantially increased the number of staff working on climate-related issues. For instance, over the course of a decade, the number of dedicated climate staff in the UK Treasury has risen from around 20 to, at times, more than 100. Ministries of Finance that have rapidly increased their staff have usually done so through a mix of moving staff internally, hiring staff from within the civil service, including the Environment Ministry, and hiring externally (interviews conducted for this report).

When hiring new staff, Ministries of Finance should also consider the diversity of their workforce. The fact that economists dominate in many Ministries of Finance can lead to insular thinking as well as difficulties in coordinating with other line ministries (see Box B18). A lack of diversity 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, 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 as well as staff with 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. Indeed, recent evidence even suggests that female representation among decision-makers is linked to more effective climate policy (Mavisakalyan and Tarverdi, 2019).

The multi-faceted nature of climate change, and the constantly changing state of knowledge of climate science and the tools to drive mitigation and adaptation, make it challenging for staff to stay up to date. This makes it even more pertinent that Ministries of Finance constantly expand their skill sets. Climate training should not be a one-off event, but rather a continuous process. To stay up to date with the latest developments, drawing on knowledge and material from a wide range of sources is therefore essential, even for those providing in-house 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, as well as regional networks, that provide a space to share experience and best practice, explore new topics and discus 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 (interviews for this report).
- **Engagement with academia and other external research providers.** Academia and the wider research communities can help Ministries of Finance to draw from a broad range of country-specific research, evidence, and expertise to inform well considered decisions. Indeed, 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).

- **Seeking assistance from bilateral donors and international institutions and capacity-building programs:** Ministry Staff can participate in courses and workshops organized by international institutions and donor organizations, and participate in dedicated capacity-building programs. For instance, the Resilience and Adaptation Mainstreaming Program (RAMP) supports central ministries, including Ministries of Finance in overcoming technical constraints mainstreaming climate risks into economic policies and development plans. Some initiatives, like the NDC Partnership's Economic Advisory Initiative also temporarily embed economic advisors into Ministries.
- **Bilateral exchanges.** Bilateral exchanges between Ministries of Finance can be particularly useful to discuss the implementation of different policies and how to overcome specific challenges.
- **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.

Regional learning and exchange networks can be particularly valuable for Ministries of Finance. Learning experiences can be particularly effective when they enable interaction between countries facing similar challenges and with similar existing capabilities and resources. Given that both climate change impacts and capabilities vary across regions, countries can leverage best practice and lessons learned from neighboring countries, particularly those that face similar climate-induced disasters, to enhance resilience to climate change. For instance, 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. Boxes B22 and B23 discuss additional regional efforts in the EU and Latin America and the Caribbean.

Box B22. Supporting the implementation of green budgeting practices among the EU Member States 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 European Union via the Technical Support Instrument and supports the alignment of the 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 European Commission, in collaboration with Expertise France, and in cooperation with the Institute for Climate Economics (I4CE).

The current capacity development support is delivered in format of three modules, where the first module is organized in a joint session for several countries together, given its introductory nature and to facilitate knowledge sharing between Member States. Subsequent modules of the training are tailored to the national context and specificities and are thus delivered separately for each Member State. In particular:

- Module 1 introduces the concept of green budgeting and provides an overview of existing green budgeting frameworks and national practices. It also provides some basics on performance budgeting and green tagging.
- Module 2 consists of case studies that are tailored to the 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 expenditure, 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 of 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 as well as 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 in the implementation of tools and recommendations for better taking into consideration environmental goals in budgetary decision-making. Hence, the practical knowledge acquired will have a major positive impact on greening public budgets and 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 towards the green transition.

The EC stands ready to further support to 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

Barriers to action and ways to overcome them

Attracting and retaining skills and expertise on climate is inherently difficult and Ministries of Finance seeking to do so face a range of barriers. These include:

- **Designing in-house training programs is resource intensive.** 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.
- **External training can be expensive.** 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 limits. In addition, existing skill requirements for new staff centered around Ministries' of Finance traditional 'core' functions might make it difficult to find staff with suitable climate skills
- **Retaining expertise and knowledge is difficult.** High staff turnaround and reliance on external consultants supported by internationally funded projects make it difficult to retain expertise on climate change in the Ministries of Finance over the long term (see for instance the case of Fiji, box B16).
- **Working with external research providers fails to institutionalize knowledge**. Ministries of Finance often struggle to obtain timely policy-relevant 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.

Many of these barriers to upgrading staff capability are not easy to address. Yet, Ministries of Finance can take a range of steps to tackle them. These include:

- **Benefitting from a growing number of training programs offered online or in person by international institutions. NGOs or universities**. Many of these courses are offered free of charge or at subsidized rates for participants from low-income countries. The 2022 Helsinki Principle 2 report provides an overview of relevant training opportunities (Coalition of Finance Ministers for Climate Action, 2022g). 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 specifically tailored specifically to staff in Ministries of Finance. To improve access to relevant training, the Coalition of Finance Ministries is therefore developing a dedicated training program.
- **Participating in regional exchange and learning platforms.** These can help Ministries of Finance learn from, and exchange experiences with, colleagues facing similar challenges.
- **When there are tight budgets and/or staffing limits, Ministries of Finance can consider careful and diligent 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 limitations, including a relative lack of scrutiny compared with work produced by in-house staff, a lack of access to relevant stakeholders, and, in the case of international consultants, a lack of country-specific expertise. Most importantly in this context, unlike hiring or training, hiring consultants is unlikely to permanently increase capacity. However, there are measures that Ministries of Finances can take to avoid this. For instance, pairing a consultant with a permanent member of staff will increase access and scrutiny, while at the same time creating a learning opportunity for permanent staff and facilitating the retainment of any knowledge created during the consultancy.
- **Expanding work in climate to facilitate staff hire and retention.** Many officials interviewed for this report have 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.
- **When engaging with the research community, Ministries of Finance 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 and research with quick turnaround times to support more urgent policy questions. There are also a range of steps Ministries of Finance can take to establish collaboration with researchers, including by:
    - Publishing areas of research interests online as a starting point for engagement with a range of researcher
    - Publishing consultations on policy proposals
    - Setting up 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.

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. 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 B23. How the IDB is helping Latin America and the Caribbean implement green fiscal policies

The Inter-American Development Bank works with governments to mitigate and adapt against climate change and promote a sustainable and just transition to green economies. As part of these efforts, the Bank is working closely with Ministries of Finance in Latin America and the Caribbean 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 as well as to measure and monitor climate-related spending. As a result of this work, 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 a wide range of 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. It allows 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 that will enable them 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)

Real world examples

Given Ministries' of Finance relatively nascent engagement 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. 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 modules for civil servants (interviews with Ministry of Finance officials). 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 (see Capability 1). In both 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 instance, the Nordic Council of Ministers has organized meetings and workshops, including in September 2022 on 'Integrating Climate into Macroeconomic Modelling' (see also boxes B22 and B22).

Some Ministries of Finance have developed ad hoc and permanent arrangements to leverage external expertise. The **Irish** Department of Finance has had a Joint Research Program with the Social Research Institute since 2015. Cooperation has often focused on carbon pricing. For instance, in 2020 the Economic and Social Research 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 ton. 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 retirees, families with children, and adults living alone (adapted from Coalition of Finance Ministers for Climate Action, 2022f). Similarly, 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 the Green Technical Advisory Group (GTAG) to provide independent advice to government on a UK Green Taxonomy (Green Finance Institute, 2022). The UK also has long-standing experience externally in commissioning research from leading academics. The Stern Review on the Economics of Climate Change (Stern, 2006) and Dasgupta Review on the Economics of Biodiversity (Dasgupta, 2021) are well known examples of the utilization of research in the planning and design of climate and economic policies.

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, as well as building relationships with knowledge networks and external research providers. In particular, Ministries of Finance should consider the following steps:

- **Assess skills gaps**. To create internal capacity to deal with climate change, Ministries of Finance first need to have a clear plan on what capacity already exists internally and what expertise can be sourced externally and how. Ministries of Finance should therefore consider doing an assessment of existing skills and capacity gaps, including of 'dormant' skills that might not currently be used. The list of training areas above (table C2) as well as the Framework for Finance Ministries (Section B) can help with 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 both the training needs of climate staff as well all other Ministry staff and consider all 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 regional or global network of research institutions**: The research network 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 pertinent.

- **Consider loosening staff hiring requirements** to allow hiring of staff with diverse expertise and backgrounds.
- **Improve (access to) global training opportunities**: Ministries of Finance can engage with external training providers to ensure that available training courses are accessible for all Ministries of Finance. They should also encourage training providers to consider exceptions for small and vulnerable countries that are not in the low-income category that might not get the same access to free training as low-income countries.
- **Expand peer-to-peer learning:** Ministries of Finance from developing countries are particularly interested in bilateral exchanges with Ministries of Finance that have already made greater steps towards mainstreaming climate. Some interviewees also voiced their interest in the establishment of secondment/exchange programs that could see subject experts from different countries spending some time in another Ministry.

Capability 3b. Enhancing economic decision-making tools and data-driven analysis

'All models are wrong, but some are useful.' (Box and Draper, 1987)

Context and role of Ministries of Finance

A fundamental part of the capability in Ministries of Finance to act on climate is the analytical capability to inform high-quality decision-making on climate policies and budget allocations. This includes not only internal Ministry of Finance capability but also the related capabilities in relevant line ministries, state-owned enterprises, investment funds, development banks, and financial sector regulators.

Moreover, in a changing climate, the public sector will more than ever need precise data, predictions and projections to assess risks and identify opportunities. Having reliable information at hand will help to accelerate the switch to the net zero, climate-resilient economy, including related to climate hazards, asset exposure, vulnerability, emissions, and new technologies and their cost profiles.

To design and finance ambitious national climate strategies, 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 draw on and 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. Therefore, this is principally about Ministries of Finance better understanding four things:

1. The impact of physical climate risk on the economy and public finances over time, which is already significant for some countries and is likely to accelerate over time.
2. 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.
3. The economic, social, and financial impacts of different policy options to reach decarbonization goals and enhance resilience, and the trade-offs between them. This includes sectoral and regional impacts (including on employment) to determine how local economic activity might be impacted in a region: for example, dominated by a heavy, carbon-intensive sunset industry.
4. 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 health expenditures, and negative changes through decreasing taxes on fossil fuels, reduced consumption in select sectors, industries suffering from the transition, export losses from stranded assets, incremental investments in clean infrastructure, and 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. This operates 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. This operates 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:

1. **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 which attempt to tackle the significant shortcomings in these approaches include Agent Based modeling and social accounting matrix approaches.
2. **Climate-economy models.** These tend to estimate physical climate impacts and the economic costs of reaching decarbonization targets, historically without sufficient attention to the risks of tipping points and net benefits. They include numerous approaches such as bottom-up climate-energy models and Integrated Assessment Models (IAMs).
3. **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 transport sectors, without factoring in the links with the wider economy.
4. **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 or several points in time. They include traditional static cost benefit analysis approaches and newer approaches which 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 and their advantages and disadvantages, albeit Ministries of Finance should give priority to tools which 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. Uganda, which factored green investment into its preferred existing macroeconomic model used by the Ministry of Finance, Economic Development, and Planning—Maquette for MDG Simulations (MAMS)—to inform powerful new commitments on climate is a good example (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. The **Indonesia** analysis, 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.[39] 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) Global efforts such as the Deep Decarbonation Project, which has developed low-emission pathways for 16 countries based on an innovative pathway design framework, demonstrate new ways to more accurately capture sectoral and technology shifts than existing CGE and IAM models do (Waisman et al., 2019).

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:

1. **Diversity of approaches:** Consider the use of a broad suite of different tools and approaches depending on the specific policy questions or issue at hand, which naturally will involve choices between the specificity and generality of models or tools.
2. **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.
3. **Transparency and ease of explaining results:** Consider methods and tools which are transparent in their assumptions, on their pros and cons, and easy to explain to decision-makers. The more complex the model, the harder it is to explain the results.
4. **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.

When considering the use of macroeconomic models Ministries of Finance should ensure that they are able to factor in: (i) the processes of transformative change and disequilibrium processes; (ii) non-linearity and uncertainty in physical and economic impacts; (iii) technological innovation as an endogenous, path-dependent process; (iv) equity and justice; and (v) 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 with 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.

Barriers to action and ways to overcome them

Ministries of Finance typically face a wide range of barriers to building their analytical capabilities. These barriers include:

- **Data availability and access:** This is often a key issue, 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), IEA and multiple sources of climate risk data. One issue relates to time lags in data updates, especially important when economic structures are rapidly changing. Data coverage is another concern, especially in relation to tax and

[39] 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, 2022b– among many others

expenditure instruments. Data comparability are an additional challenge. Lack of publicly available and accessible data on, for example the costs of new technologies, is also often a major barrier to private sector investors.

- **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 their resources, both human and financial, 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 is 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 (1980s-2000s) when theoretical rigor was emphasized over empirical validation.
- **Credibility**. A strong social network effect for current models. Some current models were developed by credible individuals and institutions.
- **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, n.d.; Stern, Stiglitz, et al., 2021).

There are ways to overcome many of these challenges, but it is not easy. Creating strategies for Ministries of Finance to overcome these barriers is a process that is likely to be iterative and will need to adapt 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 the major questions that need to be addressed. 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 of climate change policies on the economy and on fiscal balances? Who would be the winners and losers under different policies?
2. **Gathering data.** Ministries should then assess their data requirements, and map out opportunities to fill in potential gaps, including using the data and insights of other ministries, research institutions, national statistics offices, experts, international organizations, and leveraging developments in access to 'Big Data'.
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, 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. **Chile,** for example, has looked deeply at 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. And **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 so far—where innovation was accelerated, jobs created, and costs and emissions were cut—were achieved by policies generally *not* supported by traditional analysis (such as CBA) and advice (Grubb et al., 2021). These included targeted investments in clean technologies, market-shaping subsidies, public procurement, and state-backed concessional lending. At the outset, static cost-benefit analysis assessments considered these investments poor value in terms of dollars per ton of avoided emissions (given that CBA analysis tends not to effectively consider the potential for declining costs with cumulative investments and the dynamic benefits). But over time they proved highly effective.

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.).

There are also a range of exciting new approaches to national accounting driven by Ministries of Finance which 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. These are outlined in further detail in Box B24.

Box B24: New national accounting approaches—beyond GDP

Gross Domestic Product, or GDP for short, is commonly known 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 is only after World War II that GDP took on such a leading position. Developed during 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 a shorthand for measuring 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, GDP's dominance on macroeconomics 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 key public services such as health and education. Higher incomes equally increase households' ability to pay for goods and services that improve quality of life.

Yet, the preoccupation with one indicator as broadly representative of economic wellbeing has played a major role in driving environmental and social costs, fueling resource depletion, climate change, and increasing inequality. In a diverse range of countries sustained increases in GDP per capita have not always translated into sustained increases 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 hold a strong reign on countries' assessments of their economic progress and prosperity.

Some countries are starting to take a broader perspective on how to further develop and invest in their economies. Rwanda is developing Green GDP metrics by subtracting environmental costs from traditional national accounting approaches. 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)

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 is an equally emergent 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, there is a growing set of efforts 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 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 towards purpose, beyond growth of GDP as an end in itself.

These types of efforts aimed at shifting the way we view and measure prosperity are supported by a host of initiatives by the EC, World Bank, OECD, UN, Wellbeing Economy Governments Partnership (WEGo), and Wealth Accounting and the Valuation of Ecosystem Services Partnership. They 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 select and very small set of indicators to offer insightful complementary information alongside GDP may well be the preferred compromise for the time being. 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.
- Leading, with key line ministries, country and sector studies which 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, with particular attention to the specific fiscal implications.
- Drawing on a range of analytical approaches and tools with a focus on those which:
  - 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 to base investment and budget decisions on or to measure the success of policies.

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

This guide outlines 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 so far has shown that building the capabilities and drive transformational reform across all the key areas outlined in this report will be demanding for any ministry. While a comprehensive approach would be ideal, many may have to take a more gradual, stepwise approach, focused in a few key areas such as core fiscal and budgeting issues where they might have the most immediate initial impact. They can then build from there.

Ministries of Finance tend to differ from one another in several key ways. These include:[40]

- **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 for economic and public finance issues.** In some countries, there is more than one ministry charged with finance issues—e.g., in **Australia**, **France**, **Turkey** and **the US**. Nearly half of countries have separate Ministries of Finance and Economic Planning.
- **The level of capabilities required 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.
- **The 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 encouraging cooperation, and flexible business processes, tend to be more open, communicative, smaller, and take a broader policy perspective.
- **The 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 transport systems.

These differences mean that the scope for rapid organizational change will differ markedly across countries. The experiences and work done to date under Helsinki Principles 2 and interviews that informed this report 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, as well as 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 dimensions above also matter greatly, such as the strength of staff and skills levels, internal and external coordination, the independent authority of the Ministry of Finance to take decisions on organizational and staffing issues, and the legal environment for resolving policy issues within government. An accurate diagnostic of these differences is therefore fundamental to determining appropriate organizational reform strategies. For example, where organizational

[40] Based on Allen et al. (2015, 2016) and additional contributions by Richard Allen.

segmentation is strong the establishment of cross-cutting teams with representatives from relevant departments and units can be especially useful to help derive 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 important changes to the existing units, functions and responsibilities of the Ministry rather than changes to the whole structure.

Easy answers on the pathways and priorities for reform are therefore not readily available. The challenges and solutions will be country-specific and even among experts, the appropriate role for Ministries of Finance in driving climate action and how it should evolve over time is contested, including among those who have worked together to develop this report.

However, it is possible for Ministries for Finance to be guided in assessing the right reform approach by undertaking organization-wide capability reviews for net zero and climate resilience. Similar to those used more broadly to shape public-sector departmental reforms in some countries, such as the UK, Australia, and some sub-Saharan African countries, capability reviews can help Ministries to undertake honest and robust assessments of options for reforming core functions and capabilities. They could be inspired by the framework outlined in this report.

Global call to action for Ministries and Ministers of Finance

Whatever the context, the direction of travel should be towards more a proactive role by Ministries of Finance. Below 15 transformative actions are identified which, if embraced by Ministries of Finance, can strengthen implementation of the Helsinki Principles and send a strong signal that the world economy is poised to follow a low-carbon, climate-resilient direction. They are segmented into three groups:

1) The efforts that should be considered by Ministries of Finance to reform their own capabilities to be fit for purpose, starting with this given its importance.
2) The core functional areas in which Ministries of Finance typically have primary responsibility.
3) The core functional areas in which Ministries of Finance need to typically work actively with other ministries, government agencies and other actors to drive change.

This report recommends that Ministries of Finance could enhance their climate leadership and capabilities by:

1. **Developing clear Ministry-wide strategies and working with Heads of State to enhance their mandates for climate action.** This can help to empower and enable Ministries of Finance to marshal internal resources to play a more active role in mainstreaming climate action across all their key functions. This enhanced mandate could come from legislation, the Government's overall program, or be initiated through the strategy development process.
2. **Reforming internal institutional arrangements to ensure dedicated capacity for climate action.** This could include redefining senior-level responsibilities, new collaboration processes, and appointing designated and qualified staff as focal points. Where resources permit, establishing dedicated climate change units combining redeployment of existing staff and recruitment of new experts could be considered. Strategies could include designating a small team to coordinate work on climate, with a large bulk of work being done within the existing teams.
3. **Actively participate in inter-agency and stakeholder coordination and ensuring a whole-of-government approach to climate policy.** At a minimum, Ministries should consider identifying areas requiring collaboration and participation of the Minister and Ministry of Finance in existing inter-ministerial coordination mechanisms and allocate resources accordingly.

4. **Investing in new skills and expertise to drive climate action.** This can be done through in-house training, recruitment, engagement in peer-to-peer networks such as the Coalition of Finance Ministers, engaging with academia and other knowledge providers, and by leveraging expertise from other agencies. Ministries of Finance can start by assessing specific skill gaps and developing training and hiring plans.

5. **Investing in a range of enhanced economic decision-making tools and approaches** to improve the quality of decision-making by assessing climate and transition impacts and the costs, benefits and fiscal impacts of different pathways and investments. This should include overcoming the shortcomings of traditional general equilibrium and cost–benefit approaches by capturing non-linear climate impacts and non-marginal changes in the economy.

Enhancing these capabilities will allow Ministries of Finance to go faster and further in driving climate action across the core functions identified above. The areas in which Ministries of Finance can have the most significant immediate impact based on their primary responsibilities include:

1. **Actively using the full suite of fiscal policy measures to transform macroeconomic incentives for climate action.** Ministries of Finance should design coherent smart policy packages that address multiple market and non-market failures and enable them to capitalize on the strong interactions between fiscal instruments while avoiding contradictions. This should include ambitious carbon pricing schemes and subsidy reforms supplemented by other fiscal incentives and regulatory reforms to transform economic systems.

2. **Reviewing and redesigning the overall tax system for net zero and climate resilience.** Domestic resource mobilization to underpin investment in the transition is critical. Ministries of Finance should commit to making a net zero tax strategy a key element of budget processes and to future-proofing future tax policy changes. This should include identifying new sources of tax revenue for sustainable infrastructure investment and to prevent unplanned declines in tax revenues on the production and consumption of fossil fuels. Potential sources might include new forms of environmental taxation, motoring taxes, road pricing, property and land taxation, and reforming general taxation.

3. **Paying particular attention to active use of the annual budget process and medium-term expenditure frameworks to drive transformation of all sectors of the economy** to deliver on national climate objectives. This should include the responsible use of debt financing (including green bonds) for investment and greening public procurement. And it should include addressing the significant impacts that climate-related risks might have on the economy and public finances, including through identifying and planning for known and unknown contingent liabilities through investments to enhance economic resilience.

4. **Raising, steering and blending finance for investment at unprecedented speed and scale,** with a view to leveraging at least an additional 2% of GDP in public and private investment year on year for the next decade and beyond. Emerging markets and developing countries should look to go further than this, supported by the international community. This should include establishing multi-stakeholder platforms or taskforces to support the creation and implementation of Sustainable Finance Roadmaps for the public and private sector, including greening the financial system, the development of disaster risk insurance for all, and the potential use of blended finance and country platforms to help aggregate investment pools and access international climate finance. It should also include working closely with sub-national governments to increase investment in sustainable urban infrastructure, including public transport systems (especially important post-COVID-19).

5. **Leveraging international climate finance and encouraging the strengthening of the global financial architecture,** working with Foreign Ministries and development agencies. For countries eligible for official development assistance, their Ministries could develop climate finance

strategies to detail the further investment needed to implement Nationally Determined Contributions, Long-Term Strategies and National Adaptation Plans and proactively call for enhanced support for climate action by the regional and multilateral development banks through building coalitions for capital increases, stretching balance sheets, reforming lending limits, greater use of risk pooling and guarantee mechanisms, and special drawing rights. Shareholders should continue to encourage an increase in international climate finance, especially concessional finance and finance for adaptation.

To be effective, these measures must be complemented by engagement in a broader suite of strategic policy areas. Ministries of Finance will need to play an ever-growing role either in supporting other government agencies or in co-leadership. This includes:

1. **Integrating climate action into national growth and development strategies.** This will help to ensure that climate action and economic development are achieved together and should include supporting other ministries to develop industry, innovation, and sector strategies fit for the 21st century challenges of climate action and economic transformation.
2. **Supporting line ministries to develop fully costed national climate strategies** – including Nationally Determined Contributions, Long-Term Strategies and National Adaptation Plans—by investing resources to engage in all phases of the process: planning, implementation, monitoring and revision and ensuring that they are implemented by integrating them into core government processes. Ministries of Finance should work with the respective lead agency to agree on clear roles and responsibilities and even consider taking on overall responsibility for planning and financing a roadmap for a net zero and climate-resilient economy.
3. **Developing sustainable, inclusive and resilient transition and investment strategies** as part of the above processes. These should assess economy-wide and sector-specific investment needs, identify and outline steps for overcoming impediments to investment, including by building mechanisms for translating investment planning decisions into concrete programs and pipelines of projects, and embedding national climate plans into public investment planning.
4. **Leveraging their shareholder positions in state-owned or regulated entities.** Strategies should include greening national development banks and sovereign wealth funds and updating central bank responsibilities on monetary policy and regulation of the financial system.
5. **Working across all these policy areas and with other line ministries and stakeholders to develop just transition plans and policies for all key sectors of the economy.** At the heart of this work should be ensuring climate policies consider potential positive and negative social impacts, and that affected stakeholders are included in decision-making.

As with other areas of government reform, enhancing the ability of Ministries of Finance to act on climate should be seen as a journey, a process of sustained progress. Ministries of Finance should seize the moment to redefine their roles to address the most defining challenge of our time. **The important point is simply to get started. There is no time to lose.**

Coalition of Finance Ministers for Climate Action Draft Implementation Plan

Although the urgency of action cannot be overstated, the implementation of the relevant functions and roles discussed in the report will require a sustained, long-term effort by any country. Therefore, issues related to the prioritization and sequencing of actions will need to be carefully considered. Priorities for action will depend on country-specific circumstances and challenges.

The Coalition of Finance Ministers will use the coming months before the finalization of this report to determine ways to support its members to implement the findings of this guide.

The implementation plan could be built on the following elements:

1. Ensuring enhanced **awareness and recognition by Finance Ministers** and more broadly about the important role they have to play in driving climate action and the concrete actions needed to mainstream climate within the core functions and capabilities of Finance Ministries, starting at the April 2023 Ministerial meeting (e.g., by sharing the findings of the report and concrete country case studies in global, regional, and country fora).
2. Designing enhanced **training and technical assistance programs** for Finance Ministries at the global, regional and country levels, starting with possibilities and program offered and / or being designed by the Coalition's Institutional Partners.
3. Developing **research networks** of relevant national, regional, and global actors to ensure high-quality analysis and research is available to Finance Ministries that plugs knowledge gaps and supports implementation of the Helsinki Principles and design of policies and tools for the mutual benefit of Coalition Members, drawing on good practices and frontier ideas, taking inspiration from parallel research networks (e.g., INSPIRE which serves the NGFS).
4. **Deepening dialogue on implementation of the guide at the country and regional levels**, possibly with focus on specific functions, capabilities, and challenges, using regional workshops or country 'roadshows' with finance ministry staff and senior management teams and relevant partners.
5. Organizing a range of global or regional **debates** in areas of contestation to enhance global consensus around the important role of Finance Ministries in driving climate action.
6. Giving further consideration to guidance or discussion around how Finance Ministries can balance **short-term and long-term priorities** – taking into account country-specific contexts and challenges.
7. Deepening understanding of the relevance of the **climate – nature nexus** for Ministries of Finance
8. **Engaging with relevant stakeholders** for feedback and ideas to enhance the guide and supporting materials over time (e.g., at COP meetings).
9. Receiving **Ministerial feedback** on how to clarify or strengthen the role of Ministries of Finance and their engagement in global climate processes in the run up to COP28 on Climate and COP16 on Biodiversity, using the October / November 2023 Ministerial Meeting.
10. **Discussing progress** by Coalition members annually and bringing priority areas into the Coalition's **annual work program.**

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Annexes

Annex 1. Table D1. The central role of Ministries of Finance in driving climate action vis-à-vis other actors

This table includes a non-exhaustive list of typical policies which will require Ministry of Finance leadership or involvement. It inspired some of the summary tables and diagrams outlined in the main report such as Table A2 but is not fully aligned with them. Blue shading indicates where co-leadership between Ministries of Finance and relevant line ministries such as Water, Energy, or Transport is likely to be needed. This usually pertains to designing sector specific fiscal incentives.

Development goal	**Policy approaches**	**National policies**	**Type of intervention** (Fiscal / regulatory / information / governance)	**Leading role for Ministry of Finance** including with other finance agencies (Assessment based on whether measure has direct fiscal implications)	**Leading role for line ministries (non-financial)** supported by Ministries of Finance (including through the budget)
Cross-cutting macro and fiscal policies (Selected examples)	Transform economy wide incentives	• Establish carbon pricing or taxation • Remove fossil fuel subsidies	F F	X X	
	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 (including to reduce footprint of government building stock)	I; F	X (Note 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 – focus here should be on design not implementation • Revise fiscal and regulatory incentives favouring less dense / sprawled development	F F	X X	 X
Low-carbon transportation	Multi-modal mobility planning and infrastructure development	• Establish national mobility policies • Fund low-carbon transportation infrastructure including for EVs • Align national infrastructure spending priorities with multi-modal transport goals	R* F F		X X (incl. through budget)

	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, including to reach underserved populations	F	X	X
	Promote vehicle efficiency and clean energy alternatives	• Enact fuel efficiency and alternative vehicle standards	R		X
		• 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 labelling for vehicles	I		X
		• Provide national driver training programmes	I		X
	Optimize freight transport efficiency	• Establish national freight transport planning and logistics policies	R*		X
		• Provide fiscal incentives or requirements for freight transport 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 labelling programmes	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 labelling programmes, and incentives for efficient building design and construction	R		X
		• Establish energy efficiency funding programmes	F		X (incl. through budget)
		• Adopt utility sector regulations and reforms to promote energy efficiency	R; G		X
	Encourage the 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 labelling programmes	I		X
		• Provide fiscal incentives for the purchase of energy-efficient technologies	F	X	X
Energy transition		• Provide fiscal incentives for the purchase of distributed energy resource technologies	F		X

		• Adopt utility sector regulations and utility reforms to enable local energy systems (including reaching underserved) • Fund national and local energy supply projects	G F		X X (incl. through budget)
Efficient waste management	Promote integrated sustainable waste management	• Adopt utility sector regulations and utility reforms to enable local energy systems (including reaching underserved) • Fund national and local energy supply projects	R* F		X X (incl. through budget)
	Encourage waste prevention	• Enact extended producer responsibility policies • Enact policies to discourage or limit unnecessary waste	R R		X X
	Increase waste collection and recycling	• Establish national waste collection and recycling goals • Provide funding, subsidies and incentives for waste management and recycling facilities • Design and implement taxes or levies on products to cover recycling and safe disposal	R F F	 X	X X (incl. through budget) X
	Promote recovery of landfill gases and energy from waste	• Create landfill gas capture and utilization standards • Fund landfill gas energy and waste-to-energy infrastructure • Modify utility sector regulations to enable feed-in from landfill energy sources	R F G		X X (incl. through budget) X
Agriculture and land use	Avoid deforestation and degradation	• Laws to protect indigenous rights	R; G		X
		• Strengthening and expanding protected areas	R; G		X
		• Transparency laws around supply chains based on forest products	R; G		X
		• National programmes for REDD+ including 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 small holders	R*		X (incl. through budget)
		• Support research, development and demonstration 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 research, development and demonstration for hard to abate sectors and new green industries	F; I		X (incl. through budget)
Innovation	Drive research, development and demonstration of low-carbon technologies	• Support research, development and demonstration of low-carbon technologies	F; I		X (inc;. through budget)
Adaptation and Resilience	Water management	• National water allocation policies which 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 programmes for informal settlement and WATSAN infrastructure upgrading	R*; F		X (incl. through budget)
		• Setting policies for regulation and disclosure by private sector of physical and transition risks	F: I	X (usually with other CFAs)	
		• Designing new financial and insurance products with industry for enhancing resilience (e.g. weather based insurance for small holders)	F	X	X
		• Establishing national disaster reconstruction and recovery funds with contingent credit lines	G; F	X	
Just Transition measures	Dedicated examples. Note: policy measures above should also take into account social considerations in their design to ensure political support and effective implementation	• Funded national retraining, skill development, and relocation programmes for relevant sectors	R* / F		X (incl. through budget)
		• National regeneration programmes to attract new investment and jobs in impacted areas	R*; F		X (incl. through budget)
		• National social protection and security programmes for impacted communities and workers and enhance energy and food security	R*; F		X (incl. through budget)
		• National plan for integration & inclusion of marginalised groups, including women, indigenous peoples, ethnic minorities	R*		X (incl. through budget)
Other measures		• Reform regional and local fiscal powers to unlock new resources for climate action	G; F	X	X

	Inter-governmental fiscal and financial capacities	• 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 (including 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 programmes	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 behaviours including public health campaigns (including in low-income regions)	I		X

Key: **R =** Regulatory tools; **F =** Fiscal tools; **G** = Governance reforms; **I** = Information & capacity-building

R* = National frameworks are primarily regulatory tools, but typically address all four factors above

Source: Authors, drawing on expert advisory group input, CUT (xx), New Climate Economy (2018), Global Commission on Adaptation (2019)

Annex 2. Table D2. Key entry points for mainstreaming climate action in budget formulation at strategic, detailed planning, and execution phases

Date (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			
t (Budget year) - 12 months	Budget framework paper (BFP) on medium term strategic policy priorities	BFP Should highlight the governments key specific and cross cutting climate change issues/strategies	MoF (with line ministries and other stakeholders)
	Update to macro-fiscal framework (including the MTFF) based on recent GDP forecasts and the latest revenue/expenditure/financing forecasts and fiscal risk framework	MTFF should incorporate analysis of the 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 including the medium-term fiscal framework (MTFF) to guide Sector Plan updates and Budget Policy formulation.	MTFF/MTBF Should include guidance/reconciliation of overall and specific climate change/green transformation fiscal and budget policies/measures including those related to revenue and financing	Cabinet and MoF (in partnership with line M and other stakeholders
t- 10 months	Issue of revised policy priorities and fiscal parameters going forward including draft medium term budget framework (MTBF) for MDAs to enable updating of sector strategic plans including 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 SWG/LMs to consider when developing strategic plans (ongoing and new) including financing/funding envelopes	MoF
t - 8 months	Review of previous and current years' plan/budget execution (policy efficiency, effectiveness, and impact)	MoF and Line Ministry (LM) responsible for climate change strategies should disseminate methodologies and analysis for LM assessment of the implementation and impact of current climate change policy measures	MoF (in partnership with line ministries and other stakeholders)
	Submission of draft updated sector strategic policies, plans, resource requirements including 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	line ministries and SWGs
	Review of sector strategic plans, including investment plans for consistency with MTFF, MTBF and policy priorities	Determine between MoF and SWG/MDAs of the extent to which strategic plans and actions are consistent with overall climate change strategy and available resources	Joint leadership - between MoF and LMs
t - 7 months	Updated macro-fiscal forecast including the 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
t – 6 months	Prepare Budget Circular including binding ceilings	Include resource allocations and financing (capital/recurrent/other) to support climate actions	MoF

PHASE 2: DETAILED BUDGET PREPARATION PHASE			
t – 6 months	Mid-year review of current budget and previous years 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 line ministries and other stakeholders)
	Audit report on previous year's annual accounts and financial statements		Auditor General
t – 4 months	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
t – 3 months	Budget hearings (including discussion with international partners)	MoF and LM discussion of the extent to which detailed plans and budgets are consistent with agreed climate change strategies and policies	Joint leadership - between MoF and LMs
t - 2 months	Finalize budget proposals and documentation including 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
t - 0 months	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 an efficient financing strategy based on MTFF and MTBF, long, medium, and short-term financing requirements, and on cash flow forecasts and the 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 a 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 a 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 in respect of investment appraisal and selection, procurement and contracting, grant distribution etc.	MoF to ensure budget execution system provide for effective implementation of climate change policies (investment, regulatory, subsidies, grants, loans etc.)	Joint leadership - between MoF and LMs
Accounting and performance monitoring	Effective financial management systems that support tracking of revenue/expenditure/financing transactions using recognized classification standards reporting principles (GFSM 2014, IPSAS)	MoF to implement a 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 of climate change policies/performance indicators and complies progressively with the Financial Statement requirements of International Public Sector Accounting Standards (IPSAS) and Government Fiscal Statistics (GFSM)	Joint leadership - between MoF and LMs

Source: Prepared by Peter Murphy (Expert Advisory Group)

Annex 3. List of resources for Ministries of Finance

[to be added]