

Strengthening the Role of Ministries of Finance in Driving Climate Action

A Framework and Guide for Ministers and Ministries of Finance

Synthesis Report: Consultation Draft

Version 1.1 - December 2022

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?

Contents

Introduction	3
PART A: Why Ministries of Finance matter for climate action and economic transformation	4
An opportunity to tackle multiple crises.....	4
The unique position of Ministries of Finance in the drive to net zero	6
Strengthening the role of Ministries of Finance to act on climate	8
PART B: A Ministry of Finance framework for climate action	15
Introduction	15
Using the framework	16
Function 1. Reforming macroeconomic strategy through shaping national plans and transition strategies.....	18
Function 2. Reforming fiscal policies and the budget process	25
Function 3. Reforming financial policy and the financial system to finance the transition at speed and scale	31
Cross-cutting. Just transition and the role of Ministries of Finance	40
Capability 1. Leadership and governance for driving climate action.....	41
Capability 2. Coordination and collaboration for whole-of-economy climate action	43
Capability 3. Human capacity, expertise and economic decision-making tools.....	45
PART C: Priorities for action for Ministers and Ministries of Finance	49
Global call to action for Ministers and Ministries of Finance	50
Coalition of Finance Ministers for Climate Action Draft Implementation Plan	53
Authors and Acknowledgements	54
References.....	56

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.

Ministries of Finance hold significant levers for accelerating climate action. As center-of-government bodies at the crux of coordinating economic, fiscal and financial policymaking, 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 sustainable, inclusive and resilient growth. 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 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.

The report 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 investment in the zero-carbon, climate-resilient future. Ministries can use the framework to help build their core functions and capabilities to act on climate.
- **Part C** lays out an overall agenda for action for Ministries of Finance and suggests ways in which they can craft strategies for action tailored to their specific circumstances and local context.

This report is a synthesis of a longer report produced by the Coalition of Finance Ministers for Climate Action ('the Coalition'), which discusses the evidence, arguments and country case studies presented in this synthesis in more detail. By synthesizing the full report, we intend to provide Ministers and officials with a snapshot of a core agenda for action.

The report is based on an extensive review of existing literature and interviews conducted with officials in Ministries of Finance from 15 countries (Bahamas, Chile, Denmark, Finland, Indonesia, Ireland, Jamaica, Malaysia, Rwanda, Spain, Korea Uganda, United Kingdom, United States, Uruguay), complemented by input from over 30 leading individuals and institutions, including those supporting the work of the Coalition. It aims to leverage and connect the six Helsinki Principles¹ and offer guidance on their implementation. Work on the role that Ministries of Finance should play to drive climate action is a rapidly evolving field and gaps in knowledge remain.² This guide should be seen as a starting point, which will be refined following feedback.

¹ The Coalition of Finance Ministers for Climate Action brings together policymakers from over 70 countries in leading the global climate response and in securing a just transition towards low-carbon resilient development. Every member has signed up to the six '[Helsinki Principles](#)', which promote national climate action, especially through fiscal policy and the use of public finance.

² Notable exceptions to the so far limited literature are: Delgado et al. (2021) and Orozco & Jaramillo (2021).

PART A: Why Ministries of Finance matter for climate action and economic transformation

An opportunity to tackle multiple crises

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 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, taking strong action on climate supports Ministries of Finance to deal with these crises – but more than that, to achieve their core objectives as well. 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.** The current energy crisis and inflationary pressures underscore the importance of investment in a renewable energy future. A recent study suggests switching from fossil fuels to renewable energy could save the world as much as US\$12 trillion by 2050 (Way et al., 2022). This report provides examples of countries that are already successfully addressing the cost-of-living crisis with measures to drive the expansion to renewables including France, the United States and Lithuania. Some countries are already experiencing enhanced resilience to today’s energy price shocks because of farsighted leadership taken a decade ago: Uruguay’s Ministry of Finance, for example, has supported the transformation of its energy system to nearly 85% renewable energy production, which is likely linked to relatively moderate recent inflationary pressures (MoF Uruguay, 2022).
- 2. Acting on climate will help Ministries of Finance to avoid escalating risks that will have macro-critical consequences.** Without action, Ministries of Finance 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. Global temperature rises 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) – and this is likely to be a significant underestimate given approaching tipping points. The failure to respond to climate-related risks is already leading to higher public expenditures for reconstruction of infrastructure, disaster relief, and write-downs of stranded assets. Natural hazard-related catastrophes caused US\$ 2.98 trillion of damage between 2010 and 2019, 50% higher than the previous decade (AON, 2021). The changing climate has a material impact on sovereign risk and the cost of capital in climate-vulnerable countries is increasing, threatening debt sustainability (Kling et al., 2018; Volz et al., 2020). Moreover, the drivers of climate change are rapidly depleting nature and biodiversity, undermining the natural capital upon which our economy is based. Those negatively affected by climate impacts and the

transition will face increased poverty; many are already being forced to migrate and displacement is set to increase, especially across Africa, South Asia and Latin America (World Bank, 2018).

- 3. Climate action can unlock significant growth and development benefits, while generating a variety of cost savings that alleviate pressure on public budgets.** The costs and risks from climate policies are not only manageable but are significantly outweighed by their benefits (IMF, 2022a) in the fight against poverty, and in unlocking strong, inclusive, resilient and sustainable development (Lankes et al., 2022). The economic argument for climate action becomes clearer by the day, through cheaper energy, job creation, and wider benefits for the economy, environment, and society. Over the past decade the costs of large-scale solar project have fallen by 85% and onshore wind by 56% (IRENA, 2021). Many renewable forms of energy are now at cost parity with the lowest cost fossil fuels, leading to growing calls by many countries to de-link the price of electricity from oil and gas markets. Indeed, 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). By 2030, low-carbon solutions could be competitive in sectors accounting for nearly three-quarters of emissions (Systemiq, 2020). A transition to net zero can generate net benefits worth US\$26 trillion and create up to 65 million new jobs by 2030, outstripping job losses in polluting sectors (New Climate Economy, 2018). And it offers an opportunity to capture a wide range of environmental, social, gender, and health benefits, such as avoiding over 9 million premature deaths annually associated with air pollution (Fuller et al., 2022).
- 4. Investing in resilience to the growing incidence of climate hazards can unlock a ‘triple dividend’ for the economy, society and environment.** The impacts of global climate change are already evident in higher temperatures, acidifying oceans and increasingly frequent and more extreme weather events, carrying an ever-higher price tag. Investing in resilience leads to the three dividends of avoided losses, economic/development benefits, and social and environmental benefits. The second and third dividends combined are often larger than the avoided losses, which is particularly important given that they accrue regardless of whether the actual climate risk materializes (Heubaum et al., 2022; Roezer et al., 2021). The Global Commission on Adaptation (2019) argues that investments of US\$1.8 trillion up to 2030 in improved warning systems, resilient infrastructure and water resources, improved dryland agriculture and mangrove protection could generate 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 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. Well-designed climate action can provide considerable development benefits and help in the fight against poverty (Lankes et al., 2022).

Far-sighted leadership would therefore see investment in creating the economy of the future, based on cheap, secure and clean energy, rather than the economy of past based on expanding domestic fossil fuels and blanket energy subsidies. The right policies would produce an economy with new forms of high value-added employment, and 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. While no Ministry of Finance is the same, they typically 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.

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 country visions, plans and investment strategies. They usually have direct control over macro-fiscal policy and regulatory functions including taxation, budget and debt management. 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.³ They are shareholders and/or regulators of the activities of state-owned enterprises, sovereign wealth funds, and national and multilateral development banks. And they often play key roles in regulating the financial sector and in supporting the leadership of other actors.

Ministries of Finance not only have the incentive to act to drive climate action to achieve their core objectives, but also the experience to do so. Ministries of Finance can draw on their experience from responding to other major economic 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 & Ryan-Collins, 2022). Their response to COVID-19 as well as the 2008 Global Financial Crisis demonstrated that Ministries of Finance can be flexible, innovative leaders, tackling the challenges of the day to protect citizens and businesses. Ministries of Finance that can bring similar qualities to bear to tackle the climate crisis, and that 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.

The Coalition of Finance Ministers for Climate Action demonstrates that Finance Ministers together can 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. 81 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. These six principles promote national climate action, especially through fiscal policy and the use of public finance. And there is growing awareness and involvement by Ministries of Finance in climate action. Now, Ministries of Finance need to build on this leadership.

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

³ This reflects the approximate share of public expenditure as a proportion of global GDP.

this effort and enable and support the climate leadership of other actors, including through budgets. It is especially important that the 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).

Yet there remains a substantial disconnect between the ambition of national climate strategies and the supporting policies and resources provided. 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). 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). And only 14 out of 35 OECD countries are practicing green budgeting (OECD, 2021c) with public procurement worth US\$11 trillion in 2018 still largely invested in higher carbon goods and services (World Bank, 2021).

Global investment to mitigate and adapt to climate change needs to be significantly increased. 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 exist⁴, covering different geographies and sectors: Vivid Economics estimates global investment is needed of US\$2.6 trillion per year 2021–2025 and US\$4.5 trillion per year 2026–2050 in the energy and land use sectors (Vivid Economics, 2021). Similarly, Systemiq estimate for Stern et al. (2021) that investment needs for the net zero and climate-resilient global economy of amount to up to US\$4 trillion per annum 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, AFOLU, 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 3–4% in emerging markets and developing countries, and potentially higher (Stern et al, 2021; Bhattacharya et al, 2022, Songwe et al. 2022). Yet less than US\$653 billion in annual investment was deployed in 2019/20 (CPI, 2022), with a particular shortfall

⁴ See Table A2.2 page 90 in Songwe et al. (2022) for an overview). It is important to note that these mainly focusing 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.

on adaptation finance, which is five to 10 times below current needs (UNEP, 2022a). Meanwhile, deep pockets of private capital remain largely untapped, hampered by market and non-market failures that lead to an undersupply of private capital for investment.

Investment priorities include transforming major economic and emitting sectors, including the energy sector; strengthening adaptive capacity and building resilience; coping with loss and damage; natural capital, including sustainable agriculture, land use practices and conservation and biodiversity; and fostering a just transition that involves affected people and ensures a fair and wide distribution of the benefits of the transition.

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. 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.

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.) But 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). The principal challenge for Ministries of Finance will therefore be to raise and redirect 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.

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 (Stern, 2022), acting across a wide range of areas governing key aspects of macro, fiscal and financing policy.

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 strategy, fiscal policy, and financial policy, with a broad range of important sub-functions such as investment planning and regulation and supervision of the financial system. 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 into 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]	<ul style="list-style-type: none"> • Oversight of national development and structural reform planning* • Oversight of sector plans* • Macro-fiscal forecasting* • Capital investment planning* 	<ul style="list-style-type: none"> • 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] <i>Tax and debt management</i>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
<i>Budget management</i>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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]	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 et al. (2015) 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 adapted from Allen et al., 2015, 2016a.

As above, enhanced action by Ministries of Finance will also 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 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 the policy areas for which they are directly responsible (see Table A2).

Table A2. The role of Ministries of Finance in climate action and supporting actions by 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:
<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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:	
<ul style="list-style-type: none"> • 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: Source: Based on Table D1 in the Annex and other sections of the main report.

To deliver on this agenda will require Ministries of Finance 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. It will be especially important for Ministries of Finance to shift how they view climate action: from a cost to a unique growth and investment opportunity. Ministries of Finance must also confront a natural but acute risk aversion to spending commitments in frontier policy areas, concerns

about risks to the tax base from electrification and phasing out fossil fuels, aversion to use of green taxes, fiscal incentives, and earmarking carbon price revenue, and a conservative approach to the active use of fiscal policy and non-market mechanisms.

In many cases, Ministries of Finance will need to overcome acute gaps 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, institutional set-ups, as well as 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 summarizes 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. A snapshot is provided in Tables A3 and A4. These examples are supplemented by other reports published by the Coalition.

Table A4: Examples of good practice by Ministries of Finance in core functional areas

Action area	Country examples	Page Number
Function 1: Reforming macroeconomic strategy through shaping national plans and transition strategies (Helsinki Principles 1 and 6)		<i>To be added</i>
Nationally Determined Contributions (NDCs)	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - Fiji MoE costing the NAP - Togo aligning the NAP process with national budget planning 	
Long-Term Strategies (LTSSs)	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Uganda MOFPED's National Development Plan and Green Growth Strategy - Nigeria MoF leading the National Development Plan 	
Industrial and innovation strategies	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Bahamas' MoF identifying climate infrastructure investment opportunities 	
Expenditure and budget frameworks	<ul style="list-style-type: none"> - France MoF preparing a Green Budget - Nepal's MoF including a Climate Budget - Canada's Strategic Environment Assessment for policy and program proposals 	
Greening public investment management	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Rwanda Revenue Authority under MoF implementing reforms to tax collection 	

Action area	Country examples	Page Number
Debt financing, including through green bonds	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Germany's KfW investing in environmental protection - Bancoldex in Colombia financing low-carbon public transport 	
Leveraging sovereign wealth funds and state-owned enterprises	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - UK Treasury changing the remit of the Bank of England's Monetary and Financial Policy Committees 	
Greening the financial sector	<ul style="list-style-type: none"> - Netherlands NCEP financial sector commitments - Luxembourg launching Sustainable Finance Initiative - Germany MoF launching a Sustainable Finance Strategy 	
Innovations in financial models	<ul style="list-style-type: none"> - Indonesia creating an international framework for blended finance - The EU launching its External Investment Plan 	
Green finance roadmaps	<ul style="list-style-type: none"> - Australia, the UK, Netherlands, Norway, Indonesia and Luxembourg developing green finance roadmaps 	
Disaster risk finance and insurance for all	<ul style="list-style-type: none"> - Jamaican MoF participating in developing risk financial strategy 	
Leveraging MDB and DFI capital	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - South Africa issuing carbon credits - Congo Basin countries developing a harmonized framework for carbon credits 	
Country platforms	<ul style="list-style-type: none"> - South Africa launching International Just Energy Transition Partnership 	
Cross-cutting		
Ensuring a just transition	<ul style="list-style-type: none"> - 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 in main report

Table A5: Examples of good practice by Ministries of Finance to enhance climate capabilities

Action area	Country examples	Page Number
Capability 1: Leadership and governance (Helsinki Principle 2)		<i>to be added</i>
Revamping MoF mandate on climate change	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Denmark's GreenREFORM Model 	

*Bold = detailed case study provided in main report; HPs refer to the relevant Helsinki Principles

PART B: A Ministry of Finance framework for climate action

Introduction

In this section we outline a framework that Ministries of Finance can use to enhance their core functions and capabilities to act on climate in a number of ‘action areas’. The areas are directly related to implementing the Helsinki Principles. The framework is organized around three ‘core functions’ and ‘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.

The three functions that can be enhanced to act as ‘entry points’ 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
- 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 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

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: Raising, steering and blending 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
- 3b: Greening publicly backed financial institutions and central banks
- 3c: Accessing deep pockets of private capital to finance the transition
- 3d: Providing disaster risk financing for all
- 3e: Leveraging international climate finance and the global financial architecture

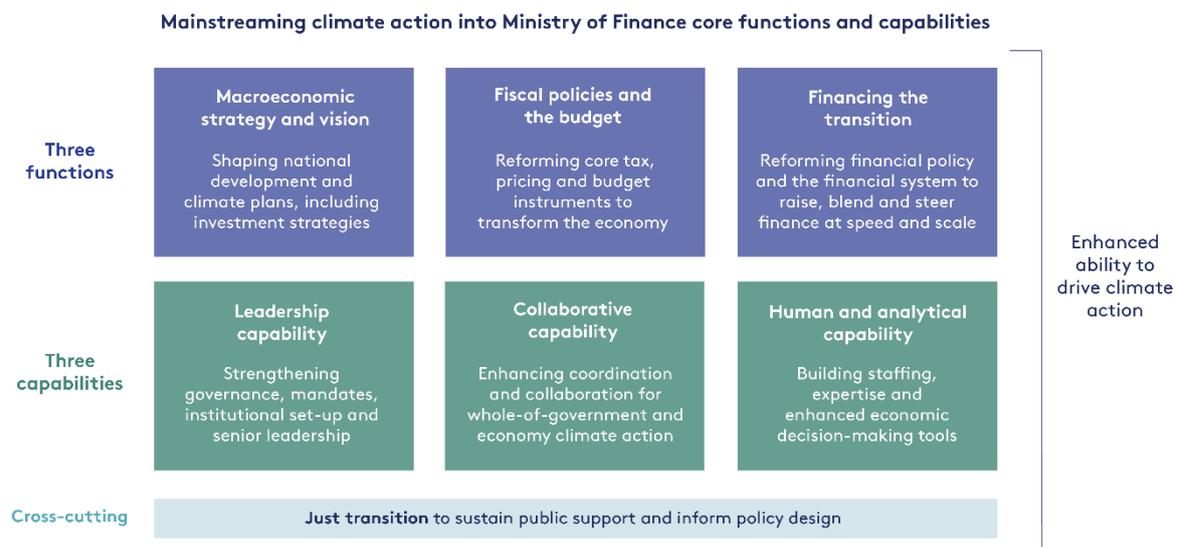
Ministries of Finance do not typically lead on the development of national climate strategies or investment strategies (Functions 1); they develop these in partnership with other line ministries and support them in their implementation. This contrasts with the primary responsibility they typically have for the budget, fiscal and financing policy (Functions 2 and 3). Despite these differences, shaping climate and investment strategies 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’.

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

- **Capability 1: Strengthening leadership** through a revamped vision, mission, and mandate and institutional set-up for climate action to provide strategic clarity on the direction of travel (HP2).
- **Capability 2: Enhancing collaboration and coordination** within and outside government for a whole-of-economy approach to climate action and investment (HP2).
- **Capability 3: Building human capacity, expertise and economic decision-making tools** for climate action (HP2 and HP4).

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.

Figure B1. Ministry of Finance framework for climate action



Using the framework

The expected outcome from applying this framework will be an enhanced ability to drive climate action and investment 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.

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. All Ministries of Finance will have to priorities and sequence the steps that they take and consider the unique context in which they each operate. 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.

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.

Shaping national climate and development strategies

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

Critical role of Ministries of Finance

The zero-carbon, climate-resilient transition will demand that Ministries of Finance place climate action at the heart of supporting national development: this will require active participation in national climate plans but also integrating them into national development plans (covered in Function 1b). Most governments are already putting in place climate strategies including Long-term Strategies (LTSs), Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs).

Ministries of Finance need to systematically engage more with these processes. When surveyed in 2021, less than half of the Coalition members had completed a cost assessment of measures in their LTS or conducted cost-benefit analyses. And while 12% of Coalition members stated they oversee the LTS process - often in collaboration with other ministries - 15% said they are not involved at all (Coalition of Finance Ministers for Climate Action, 2020a). 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). With proper engagement, Ministries of Finance can ensure that plans can be adequately costed and consider their wider financial implications and resourcing, including through their integration into wider planning and budget management processes. They will also improve their understanding of the risks and opportunities of climate action and how these relate to Ministry of Finance core objectives.

Ministries of Finance need to be more closely involved in developing long-term low emission development strategies (LTSs). Achieving net zero emissions by mid-century or before will require transformation in all sectors of the economy and Ministries can find value in using the LTS process as a planning tool to offer a long-term perspective on the policies and investments needed for decarbonization and enhancing resilience. Their involvement can ensure that the full economic benefits of decarbonization are realized, that proposed measures are costed, and that decarbonization acts as an accelerator of development (Coalition of Finance Ministers for Climate Action, 2020a)

Many Ministries of Finance are already demonstrating what successful engagement looks like at different stages of the LTS process. The development of the **UK's** net zero-strategy was supported by the Treasury, while in **Fiji**, the Ministry of Economy's Climate Change and International Cooperation Division was responsible for developing the LTS and holds the main coordination role for its implementation.

LTs are complemented by Nationally Determined Contributions (NDCs), which lay out five- to 10-year commitments to reducing emissions. Successful NDC implementation and continuous enhancement will be critical to avoid climate catastrophe while creating the strong policy signals required to accelerate the transition to a low-carbon economy. Ministry of Finance involvement is needed to ensure NDCs that are costed and financeable, while this is also an opportunity for Ministries to support opportunities for growth and development (Coalition of Finance Ministers for Climate Action, 2020b, 2022a).

Ministries of Finance’s involvement in NDCs can take different forms. In **Rwanda** the Ministry of Economy and Finance coordinated the NDC revision and participated in every stage of its updating and identified NDC-related investment needs. In **Chile** the Ministry of Finance is part of a multi-agency group that contributes to the NDC process, e.g., providing GDP forecasts for modelling different scenarios and their impact on the economy. In **Norway**, the Ministry of Finance is responsible for implementing the economic measures of the NDC, including carbon taxes and emissions trading.

With NDCs and LTs often not focusing on adaptation and resilience, National Adaptation Plans (NAPs) can enable countries, particularly developing countries, to identify and address their medium- and long-term priorities for adapting to climate change. NAPs can help Ministries of Finance set up the systems to integrate adaptation into national planning, decision-making and budgeting processes, increasing the resilience of the public finances. In **Togo**, the Ministry of Economy, Finance and Development Planning is part of an Inter-Ministerial National Adaptation Plan Committee and taking steps to align its NAP process with its national development and budget planning cycle, identifying key entry points for integration adaptation into the budget process. Meanwhile, the **Fiji** Ministry of Economy has developed a methodology to provide rapid and comparable cost estimates for the prioritized actions in Fiji’s NAP.

Despite their different timeframes and purposes, LTs, 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.

Ministries of Finance can play a range of similar roles across LTs, NDCs and NAPs, across all three key stages of climate plan development and implementation. This includes:

- **Formulation:** (i) Ensure 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) Ensure 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) Identify relevant fiscal and public policies levers for building an enabling environment for implementation.
- **Implementation:** (i) Mainstream 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, 3 and 4). (ii) Ensure adequate resourcing for implementation, including by developing dedicated implementation/financing plans.
- **Monitoring:** Develop systems to monitor implementation and track climate finance.

Ministries of Finance can also take steps to involve the private sector in climate strategy processes, and ensure integration between LTSs, NDCs and NAPs and connect these instruments to inform short, medium, and long-term policy and investments.

Barriers to action and strategies to overcome them

- **Several major barriers currently prevent most Ministries of Finance from contributing to strong climate strategy plans.** These include a lack of coordination between Ministries of Finance and Environment (or the respective lead agency) and a lack of capacity in terms of personnel or specialized knowledge (Coalition of Finance Ministers for Climate Action, 2022c). Those engaged in the process face additional barriers around data and tools, including for modelling and assessing the costs, benefits and impacts of policies and investments and monitoring, reporting and verification. There is a particular lack of granular information on long-term transition pathways and technology options for net zero, as well as for adaptation (Coalition of Finance Ministers for Climate Action, 2022a).
- **To overcome these barriers, Ministries of Finance should consider engagement in climate plans as a core part of their responsibilities.** Ministries of Finance should take care to participate in, create or strengthen governance structures that allow for successful collaboration and that articulate their involvement in all key stages of the process. Investing in staff capacity and skills, tools and knowledge will be essential (see Capability 3). For those just starting to engage in climate progress there are a variety of entry points for engagement and a phased approach can be taken to suit the context (the full report provides further detail). Initiatives such as the NDC Partnership and the UNDP Climate Promise provide expertise, technical assistance and funding.

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 – and ensuring that they are implemented by integrating them into core government processes.
- **They should work with other involved agencies to agree on clear roles and responsibilities or consider taking on overall responsibility for climate plan development** to drive action and investment across government. They can also ensure alignment across LTSs, NDCs and NAPs and encourage streamlining of the three processes.

Function 1b. Greening national development and sector strategies

Critical role of Ministries of Finance

Government strategies are a critical entry point for laying out national plans for a low carbon and climate-resilient future. Climate plans will be difficult to implement if they are not integrated into national planning processes including National Development Plans (NDPs), sectoral strategies and similar documents that ensure policy coherence across sectors and levels of government, orient both public and private sector towards a common goal and provide key inputs into the medium term and annual budget processes (see Function 2).

Ministries of Finance can be key drivers of integration between climate and other government strategies and plans, and can ensure that investments for development and climate change mitigation, adaptation and resilience are mutually supportive. Where climate strategies and development strategies lack explicit alignment – which is often the case (Okereke, 2021) - climate targets are not being adequately fed into national planning and budgetary processes, resulting in less

effective NDCs and LTSs, and NDPs ill-equipped to tackle the climate crisis. This represents a missed opportunity to reduce emissions, build resilience, and achieve socioeconomic objectives at the same time. Inter-agency coordination mechanisms are crucial for ensuring alignment. In **Uganda**, a tripartite arrangement between the Ministries of Finance, Planning and Economic Development, the Ministry of Water and Environment and the National Planning Authority is improving collaboration and alignment of climate policies with national priorities and has resulted in an upcoming National Development Plan that includes climate, as well as a green and climate-resilient growth strategy, which sets an agenda for the green transition of key economic sectors in support of the NDP II.

Ministries of Finance that are actively shaping climate strategies will be better placed to ensure their alignment with NDPs. They can support the development of strong NDCs, NAPs and LTSs with realistic measures and targets, prepared within the context of the country's broader development challenges that can form the basis for successful integration of climate into development planning. They can thus ensure the measures outlined in NDCs, NAPs and LTSs feed into the work program of the NDP, and subsequent budget and planning processes (Bird et al., 2017).

In some countries, greening sectoral strategies can be more than or equally important as NDPs. While the design process is usually led by the relevant line ministry, Ministry of Finance involvement is crucial, (i) to ensure alignment with overall climate and decarbonization strategies, (ii) to facilitate cross-sectoral coordination, and (iii) to put in place the relevant sector-specific regulations and fiscal incentives. Sectoral plans can also form part of broader decarbonization strategies. **Bangladesh** and **Morocco** have national development strategies with sectoral decarbonization plans, supported by cross-sectoral advisory bodies.

Barriers to action and strategies to overcome them

- **Failure to integrate climate plans into national planning documents can be caused by a range of factors.** A lack of engagement by Ministries of Finance in climate strategies can lead to a hands-off approach towards climate action and a perception of strong trade-offs between climate action and development. If climate strategies lack detail and sector-specific measures and targets, they fail to provide useful inputs into other strategies. Lack of cross-ministerial coordination mechanisms and misalignment of timelines often further hamper integration.
- **These barriers can usually be overcome by Ministries of Finance strongly involving themselves in national climate plans,** leading to greater awareness of the consequences of inaction on climate for development, as well as the many economic and societal co-benefits action can bring. The Ministry can also ensure that climate strategies contain the necessary features needed for successful integration into NDP or sectoral strategies.

Opportunities for action

- **Ministries of Finance should play a key role in integrating climate into national development strategies to drive economic transformation across the economy:** by actively shaping climate-related plans, to ensure they are realistic and financeable, and providing the necessary detail to guide NDPs and sectoral strategies; and possibly by aligning planning timeframes and setting up cross-ministerial governance structures to ensure successful collaboration.

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

Critical role of Ministries of Finance

An increasing number of countries are developing industrial and/or innovation policies to help the growth of new low-carbon, climate-resilient sectors and transition of old ones (Altenburg &

Assmann, 2017). Such policies can form part of National Development Strategies and be closely linked to climate plans. Ministries of Finance can contribute by financing innovation or provision of credit to new growth industries facing market and non-market barriers to expansion, complemented by measures to support the transition of high-carbon industries.

In **China**, a wide range of subsidies and regulations to promote the shift to electric vehicles, and efforts to encourage international investors to set up joint ventures with Chinese carmakers, have turned the country into the lead market for the developing, testing and production of electric vehicles. Similarly, **Chile** supports first movers through a grant that finances up to 50% of the cost of research and pre-investment in non-conventional renewable energy projects. To diversify the energy mix and reduce the share of imported fossil fuels in energy supply, **Morocco** has developed a comprehensive strategy aimed at industrialization based on low-carbon, resource-efficient technologies.

The active use of fiscal policy to accelerate green industrial transformation is justified by at least three arguments (Hausmann & Rodrik, 2003; Rosenbloom et al., 2020). First, dynamic cost curves and information failures mean that pioneers can have a ‘first-mover-disadvantage’, where they have to cover the cost of innovation but share its benefits with imitators, creating incentives not to innovate. Mazzucato (2021), for example, therefore argues that public investment is crucial for transformative innovation given its long-term and risky nature. Second, new low-emissions technologies suffer from externalities, which make the net benefits initially hard to capture by private investors. To make the establishment of new industries for frontier renewable energy technologies attractive, it can be necessary to subsidize the cost of capital to unlock sufficient private investment. Third, institutional and coordination failures might require Ministries of Finance to actively coordinate across sectors.

Supporting the development of industrial and innovation policy can take many forms. While Ministries of Finance are rarely at the helm of industrial and innovation policy, they should encourage the development of such policies, including by setting strategic objectives for multi-year policy orientation, using fiscal policy to encourage sunrise industries, ensuring financial transparency and accountability, and coordination with the private sector to identify bottlenecks and regularly assess policy results. They can also ensure that innovation and industrial strategies are climate resilient.

Barriers to action and strategies to overcome them

- **Ministries of Finance committed to supporting green industrial and innovation policy typically face three types of barriers:** concerns over limited fiscal space, over the sustainability of fiscal support, and over the ability to drive a coherent industrial and innovation policy across government. Yet industrial and innovation policies tend to have net positive fiscal impacts in the long run and there is a long track-record of Ministries successfully working with other agencies to drive industrial transformation. Functions 3 and 4 provide valuable lessons in how to design time-bound fiscal incentive schemes and create the fiscal space for investment.

Opportunities for action

All Ministries of Finance should consider the greater use of 21st century industry and innovation strategies. They should look to build a national innovation ecosystem working with other agencies, using fiscal policy and other measures to encourage green innovation and new industries.

Shaping investment strategies

Delivering on the objectives of national climate and development strategies will require Ministries of Finance to support a major ‘investment push’ in all forms of capital. While some – up to 70% in certain sectors (Vivid Economics, 2021) – of this investment will need to come from the private sector,

governments play a key role in financing critical investments, and ensuring the right enabling environment (see Part A).

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 planning as part of and/or linked to national strategy and budget processes. They will need to play a major role in, among other areas, supporting the identification of investment needs based on NDCs, LTSs, NAPs, and NDPs; using this to develop investment strategies and plans; and 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 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

Critical 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. Globally, investment in fossil fuel production is still projected to increase by 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).

Ministries of Finance, working with Ministries of Environment and sectoral ministries and the private sector, have a role to play in translating climate and development plans into investment strategies that outline, among other things the government's priorities, possible financing splits and technological preferences. These can serve as powerful guides and signal the priority of the transition to all levels of government, investors and the public alike, thereby accelerating the implementation of LTSs, NDCs, and NAPs (NDC Partnership, forthcoming). Some countries are developing dedicated investment plans for NDC implementation. **Rwanda**, in a process led by the Ministry of Finance, has identified NDC investment needs as part of its NDC Implementation Framework.

Developing investment plans will require Ministries of Finance to identify overall investment needs for net zero and climate resilience across different types of capital, sectors and technologies, based on the ambitions set out in climate and development plans. **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 and financing needs as well as barriers to investment. Over the coming years, the World Bank's Country Climate and Development Reports (CCDRs) will also help to provide data on investment needs (World Bank, 2022a).

Ministries of Finance should give consideration to the operation and maintenance (O&M) costs of infrastructure alongside capital expenditure. Not only can O&M be a significant cost factor, maintenance can also generate substantial savings. Analysis of OECD countries suggests each additional \$1 spent on road maintenance saves \$1.5 in new investments (Kornejew et al., 2019). They can also use the opportunity to consider and actively manage the socioeconomic consequences of the proposed investments, ensuring a just transition.

Barriers to action and strategies to overcome them

- **Barriers to investment at scale include fiscal barriers, technological barriers, implementation barriers, and policy and regulatory barriers.** The planning process itself can be complicated by a lack of clear climate plans with targets on which to base assessment needs, by the uncertainties associated with climate change and the lack of data on climate impacts and risk.
- **Steps Ministries of Finance can take to tackle barriers to investment planning** include proactively mapping potential barriers and designing mitigation strategies, strong involvement in national climate strategies to ensure they can serve as solid bases for investment planning, and considering needs assessment and investment planning as iterative processes to take into account changing circumstances. **St Kitts and Nevis** systematically identified sector-specific barriers to the investments as part of its NDC implementation plan and then scoped out potential solutions, including the type of technical assistance and financial instruments needed to target barriers.

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.** They should build the necessary expertise for investment needs assessments and making informed investment decisions, working closely with other stakeholders, including sector ministries and private sector.

Function 1e. Identifying and developing bankable projects and programs

Critical role of Ministries of Finance

Developing sustainable, resilient and inclusive investment strategies is only the first step towards mobilizing investment. One reason that investments currently fall short of what is needed is a lack of identifiable, investment-ready and bankable projects (OECD, 2018). It is therefore important to ensure that investment planning decisions are translated into concrete programs and pipelines of projects.

Project pipelines can help to (i) promote investment in priority sectors; (ii) accommodate the requirements of investors, and (iii) allocate project preparation support to projects that are not yet bankable. Pipelines are a key tool to prioritizing strategic projects – the most impactful investments to achieve climate targets in key sectors. Ministries of Finance can champion 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. **Kiribati's** NDC Investment Plan contains a project pipeline consisting of 15 'primary mitigation opportunities'; projects worth an estimated US\$210m, in two priority sectors, transport and energy.

Stable institutions and a supportive regulatory environment will be equally crucial to implementing investment strategies successfully. Ministries of Finance can help to ensure a clear, predictable and stable legal and regulatory environment across all sectors and all levels of government (e.g., procedures for contract enforcement). The IMF's Public Investment Management Assessment (PIMA) framework can help countries assess their investment climate and design tailored action plans (IMF, 2021b).

Barriers to action and strategies to overcome them

- **Barriers that prevent Ministries from developing or supporting robust pipelines of bankable projects** include a lack of tools to priorities climate projects, existing project pipelines that do not align with climate plans, and the high costs of project preparation. Some countries, MDBs, and development partners have set up Project Preparation Facilities that help projects get investment

ready and support pipeline development more broadly. 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, to coordinate infrastructure planning by identifying and prioritizing the most beneficial projects.

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 priorities strategic projects.** This might include in-house project support facilities or integrating climate investments into existing ones. They should also look for ways to strengthen the overall investment climate.

Function 2. Reforming fiscal policies and the budget process

[Helsinki Principles 3 and 4]

Design and implementation of national climate strategies and investment plans will require Ministries of Finance to utilize a wide range of macro and fiscal policy measures across their core tax, debt and budget management functions to shape economy-wide and sector-specific incentives and to provide sufficient resources for climate action and investment.

Priority measures that should be considered include ambitious carbon taxation or pricing schemes and subsidy reforms supplemented by other fiscal incentives and regulatory reforms to transform key economic systems; future-proofing the public finances through redesigning the overall tax system for net zero and climate resilience; and ensuring that national climate strategies are backed up through the budget.

Ministries of Finance will need to find ways to bring together the full suite of possible fiscal policy measures to drive climate action in coherent smart policy packages (Petrie, 2021). This will allow them to address multiple market and non-market failures and take advantage of the interactions between fiscal instruments that can be reinforcing, work against one another, or redundant.

Reforming tax systems and macroeconomic incentives

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

Critical 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 make an important contribution to reaching mitigation goals in cost-effective ways given local circumstances.

- **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 carbon tax, pricing or trading schemes, including **Argentina, Colombia, Chile, Canada** and the **EU**. Similarly, many countries have been able to introduce and sustain subsidy reforms. **Indonesia** raised petrol/gasoline and diesel prices by 33% in 2013 and another 34% in 2014, saving US\$15.6 billion or 10.6% of government expenditure which was reallocated to investments in social welfare and infrastructure (New Climate Economy, 2018).
- **Ministries of Finance will need to consider ways to supplement carbon pricing and subsidy reforms with other fiscal incentives to transform key economic systems.** Providing support to overcome market failures holding back the take-off of new low-carbon sectors is likely to be needed. These can take the form of tax incentives, loan programs, guarantees, credit enhancements, grants and non-monetary incentives. These can support early-stage investment in charging infrastructure for electric vehicles, funding schemes to tackle the split incentives associated with energy-saving retrofits in buildings, or cover some of the costs of integrating renewables into the grid. In the consolidation phase, public support can be phased out.
- **Most countries have long used fiscal incentives to support the growth of new industries; the growth of zero-carbon sectors is no different.** **Uruguay** demonstrates how Ministries of Finance can help to drive the energy transition using a powerful combination of fiscal incentives. In the **UK** targeted, timebound subsidies cut the cost of offshore wind by around 70% in a decade.
- **Ministries of Finance should also work with sector ministries to identify and implement regulatory standards such as phasing in net zero building codes or setting end dates for the sale of internal combustion engines.** Regulatory limits have been highly effective at curtailing pollutants and sending a signal for private sector investment and innovation (Stern et al., 2021).

Barriers to action and strategies to overcome them

- **Overcoming the challenges to public acceptability of carbon pricing and subsidy reform will not be easy.** 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, to carefully consider how to address the short-term costs in the form of raised energy bills, and to provide a predictable pathway for prices for the private sector. The current context of already high and volatile energy prices makes this even more challenging. Moreover, 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’ across a range of key emitting sectors (Heal & Schlenker, 2019; IPCC, 2022). This means that businesses often do not innovate quickly enough because of modest changes in energy prices unless strong alternative sources of energy or low-carbon solutions are available. This is why the IMF has recently called for a carbon price of at least US\$25–75 per ton of carbon depending on a countries’ level of economic development and that pricing should be complemented by other fiscal measures (IMF, 2021a), including to help catalyze new low-carbon industries and potentially enhance the responsiveness of the economy to pricing and subsidy reform measures.
- **Introducing carbon pricing and subsidy reform will require Ministries of Finance to work with line ministries to design reforms that are socially just, politically acceptable and inclusive.** This will require consultations with all impacted stakeholders, communicating tax or price increases well in advance, efficient and equitable recycling of revenue and considering how to make the benefits more visible (Bhattacharya et al., 2021; Parry et al., 2021). Carbon pricing can also be considered alongside other complementary ways to price other environmental goods or ‘bads’, such as through reforming harmful agricultural subsidies, payments for ecosystem services and taxing plastic bag use.

- **Introducing fiscal incentives to catalyze new sectors requires careful design.** Many Ministries of Finance are concerned about unsustainable fiscal commitments and ineffectively matching incentives to overcoming the specific barriers in question. These challenges can be overcome by establishing an appropriate incentive timeframe over which support can be phased out. Evaluation should also be undertaken of the benefits and costs over time, the ease of distribution and collection, the specific externalities and other market failures being targeted and their social progressivity.

Opportunities for action

- **Ministries of Finance should work with relevant line ministries to design ambitious carbon pricing schemes and subsidy reforms** in line with the Paris Agreement that are socially just, politically acceptable and inclusive, alongside considering reinforcing pricing or taxation of other environmental goods and bads.
- **Ministries of Finance should consider, too, other fiscal incentives to transform key economic systems including energy, transport and buildings.** They should consider fiscal incentive design, including an appropriate timeframe over which support can be phased out and work with line ministries to consider complementary regulatory standards such as an end date for the sale of internal combustion engine vehicles to provide market certainty on the trajectory of travel.

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

Critical 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 unlock new sources of finance for investment and to avoid impacts on tax revenues in the medium to long run. Without action, many economies could feel the impacts of declining tax revenue from fossil-fuel production and consumption, which in some countries account for over 50% and 15% of government revenues respectively (OECD, 2019). In many countries this tax base is already eroding due to increasing energy efficiency and electrification (IMF/OECD, 2021). Although their introduction is a critical first step and tool for countries in their decarbonization journey, new forms of carbon taxation cannot be relied on to form a permanent part of the tax base as carbon gets squeezed out the system. This demands that Ministries of Finance identify complementary sources of tax revenue over time as the journey to net-zero proceeds.

Physical climate risks are also likely to become ever more significant as macroeconomic impacts trigger contingent liabilities, with known and unknown costs for the public purse. These might include legal claims after climatic 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. For instance, there are now more than 2,000 documented cases of climate change litigation filed in more than 40 countries (IPCC, 2022; Setzer & Higham, 2022).

Barriers to action and strategies to overcome them

- **Reforming the tax system for net zero and climate resilience will be a major challenge for Ministries of Finance.** It will require them to work with relevant line ministries to overcome significant barriers such as strong vested interests as political groups, ministries or regional authorities compete for a share of revenues as well as citizens' expectations of immediate wealth from new fossil fuel discoveries. It will require them to develop national development plans that lay out compelling alternative economic pathways to the extractive production and consumption of fossil fuels.

- **Some farsighted and exemplar countries are looking at ways to diversify their economies and tax base away from fossil fuel production and consumption.** Many are looking to become major exporters of renewable energy, which can become an emerging source of tax revenue and reduce pressure on the balance of payments. In **Morocco** strong central government leadership has seen the share of renewable sources in electricity generation increase from 8.7% in 2012 to 37% at the end of 2020. In **Nicaragua** the share rose from 25% in 2007 to 77.3% in 2021. And countries such as **Costa Rica** have made moving away from dependence on gasoline sales revenue from state-owned oil refineries a priority as part of national decarbonization plans.
- **Countries strongly reliant on taxation of fossil-fuel consumption have a menu of options that can be considered to mitigate any reduction in fuel taxes over time.** These include phasing in motoring taxes based on distance, enhancing road pricing, use of feebates and taxes on land property, and reforms to general taxation and taxation of other assets such as financial transactions, wealth and digital services (albeit there is some concern over the efficiency of some of these forms of taxation). The **Swiss** road user charging scheme charges trucks for the distance driven rather than the fuel used, complemented by a fee-based instrument for motor vehicles.
- **Addressing the fiscal risks from physical climate impacts will require Ministries of Finance to deploy a wide range of strategies to enhance climate resilience:** improving surveillance of climate-related risks, setting up national mechanisms for quick financial responses to disasters, working with central banks to understand sources of vulnerability for the macroeconomy, and enhancing climate legal expertise. The Ministry of Finance and Office of the Prime Minister in the **Bahamas** are working together to identify opportunities for investments in climate-resilient infrastructure and the blue economy to reduce known and unknown contingent liabilities from the future impacts of climate risks.

Opportunities for action

- **Ministries of Finance should review and, if necessary, redesign the overall tax revenue system 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 should make a coherent net zero tax strategy a key element of budget processes and commit to future-proofing future tax policy changes. Potential sources might include new forms of environmental taxation, motoring taxes, road pricing, property and land taxation and reforming general taxation.
- **Ministries of Finance should take steps to enhance the resilience of the economy to climate risks and reduce the impacts of climate-related risks on the public purse,** addressing the potential impacts of growing physical climate risks on the cost of borrowing and the risk of triggering contingent liabilities with known or unknown impacts.

Mainstreaming climate in the budget

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

Critical 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 will need to be increased or redirected towards policies and investments identified in national climate strategies and investment plans. This requires embedding climate action and investment within all aspects of the budget cycle including the formal processes for the approval of

national development plans (NDPs), medium-term fiscal and budget forecasts (MTFFs), and multi annual budgets (medium-term budget frameworks) (Murphy, forthcoming)

The initial strategic phase of the budget formulation process represents a particular opportunity to influence and drive the policy debate on climate action. Ministry of Finance guidance can ensure the Cabinet of Ministers expresses its position on key spending priorities on green transformation early in the fiscal planning and budget process and that any indicative shifts in revenue, debt or budgets form part of the medium-term Budget Framework Paper.

A growing number of countries are embedding climate action within budget cycles. France prepared a Green Budget in 2021. Nepal's Ministry of Finance includes a Climate Budget in its Consolidated Financial Statements. Other countries such as Indonesia, Kenya, and the Philippines have introduced climate budget tagging to identify climate expenditure.

Barriers to action and strategies to overcome them

- **There are often wide-ranging challenges to the use of budget management processes to drive climate action,** which usually require substantive political and technical leadership within Ministries of Finance to surmount. In particular, there is often a perceived trade-off between climate action and other policy priorities including economic growth, jobs, energy security and health, but these are often not true trade-offs, as is outlined in Part A. Thus, it is crucial that Ministries of Finance look for how climate action can help support other policy priorities and vice versa. Provision of guidance to line ministries on the approach and method for review of budget submissions related to climate policy is especially important. This might require Ministries to update their appraisal guidance (see Capability 3). A wider range of approaches to budget reform are outlined in the full report.
- **Mainstreaming climate action within budgets does not require entirely new approaches.** Ministries of Finance should focus on leveraging established public financial management systems and providing clear guidance to line ministries on the requirements for strategic budget submissions at every stage of the budget cycle with an emphasis on encouraging line ministries to assess the economic and social impacts of new climate policies, the trade-offs between policy measures, and their fiscal implications.

Opportunities for action

- **Ministries of Finance should actively use the budget process to drive climate action and investment across all sectors of the economy.** This should include building on existing public financial management (PFM) processes and providing clear guidance to line ministries to ensure provision of adequate information on the economic and fiscal implications of proposed policies and investments.

Function 2d. Greening public investment management

Critical 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. While investment will be serviced through a wide range of sources, a massive ramp-up in green public investment will be needed, including to ensure public infrastructure is resilient to climate change and natural disasters. In low and middle-income countries alone, damage from natural disasters to core power and transport infrastructure is already estimated to cost around US\$18 billion per year, highlighting the urgent need for action (Hallegatte et al., 2019).

Ministries of Finance can play a key role in ensuring climate considerations are integrated into all stages of public investment management (Coalition of Finance Ministers for Climate Action, 2022d; Delgado et al., 2021). Some countries are making progress: the **Mexican** Ministry of Finance and Public Credit has developed a set of quantitative sustainability indicators to be used across all public investment projects, supporting the government in prioritizing projects with higher environmental, social and economic multipliers. **Ethiopia** has developed public investment management guidelines that incorporate climate risk screening tools into public investment decision-making and project planning. **Chile** has developed a methodology for assessing disaster risk in infrastructure projects to incorporate disaster risk analysis and assessment into the preparation and evaluation of all projects submitted to the National Investment System.

Barriers to action and strategies 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 (Coalition of Finance Ministers for Climate Action, 2021b). Scaling up investment has also been hampered by factors including outdated investment management practices and tools, difficulties in project selection, and coordination failures between stakeholders.
- Ministries of Finance need to better integrate climate action into national investment planning systems, including by developing explicit policies for public investment to address physical and transition risks and drive decarbonization and adaptation and establishing suitable project appraisal processes supported by assessment methodologies (Coalition of Finance Ministers for Climate Action, 2022b).
- The IMF has recently developed the Public Investment Management Assessment (PIMA) to assist Ministries of Finance with this challenging process. This now includes a new Climate-PIMA (C-PIMA) which can help governments identify potential improvements in public investment institutions and processes specifically to build low-carbon and climate-resilient infrastructure.

Opportunities for action

- **Ministries of Finance should align national climate plans with public investment planning to accelerate investment in reliable, resilient and green public infrastructure. This should include integrating climate action and risk management into all stages of the project cycle for public investment projects.**

Function 2e. Greening public procurement

Critical role of Ministries of Finance

Ministries of Finance usually play a major role in establishing frameworks for public procurement across government. Public procurement amounted to US\$11 trillion or around 12% of global GDP in 2018 (Bosio & Djankov, 2020). It is especially 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. More countries are incorporating green procurement into their policies. In a survey of 26 OECD countries plus Brazil, all had a framework to support environmental objectives in public procurement, although these vary widely in their stringency (OECD, 2021c).

Implementing sustainable public procurement across government could drive significant benefits for Ministries of Finance by reducing the consumption of resources such as utilities and energy, increasing the quality of goods and services purchased, reducing environmental protection costs, enabling better value for money, and promoting innovation and green jobs (Eguino & Delgado,

forthcoming). The **German** city of Regensburg used green public procurement to save €10 million in energy and water costs over 15 years. **Bogota** used green public procurement to electrify its bus fleet (ibid.)

Barriers to action and strategies to overcome them

- **The adoption of green procurement policies and regulations entails overcoming important challenges** such as a lack of trained staff in the public purchasing agencies, the lack of common frameworks across government, knowledge gaps among buyers and end-users, and finding suppliers of green products. These barriers can be overcome through training, conducting market research, awareness raising, and other measures.

Opportunities for action

- **Ministries of Finance should consider options for strengthening green procurement**, including establishing a legal and policy framework to assist procuring entities to incorporate climate objectives into their procurement procedures and developing a green procurement strategy.

Function 3. Reforming financial policy and the financial system to finance the transition at speed and scale

*[Helsinki Principle 5]*⁵

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, with 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.

This means that 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. Energy and transport infrastructure investments generate their own revenue streams and are therefore attractive to private project finance. Nature conservation has significant spillover benefits, creating a case for public finance and/or official international finance. Ministries will therefore need to ensure financing sources match the spending purpose, maturity required and local context.

Ministries of Finance will need to work at three levels: upstream, midstream and downstream. They can overcome market and non-market barriers to private finance ‘upstream’ through creating stability in climate policies and regulations (Functions 1 and 3). They can work ‘midstream’ by identifying

⁵ This section does not currently distinguish between measures to mobilize new sources of finance for investment and aligning or greening finance: both those issues are covered elsewhere in the report. The state of evidence in this area is in considerable flux and this section will therefore need to be updated as thinking evolves.

pipelines of bankable projects in partnership with the private sector (see Function 1). And they can work ‘downstream’ by using new financial instruments to connect deep pockets of 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 change. Paris Agreement Article 2.1c on making all finance consistent with adaptation and mitigation goals is one of the most important parts of the Agreement. Ministries of Finance will be responsible for much of the work to align public finance flows (Rydge, 2020). The tools outlined in this section can play a key part in this endeavor.

Function 3a. Domestic revenue mobilization to finance investment

Critical role of Ministries of Finance

For most countries, the 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 in sustainable and resilient infrastructure. The median low-income developing country collects 15% of GDP in tax revenue, emerging markets collect 18% and advanced economies 26%. Most Ministries of Finance in emerging markets and developing countries can therefore consider steps to increase revenues by 3–7 percentage points of GDP (Benedek et al., 2021).

Debt financing for investment is another option. Sovereign debt, which accounts for half of the US\$100 trillion global debt market⁶, is already a major source of financing for investment for Ministries of Finance. Sovereign bonds can be especially useful for Ministries looking to raise long dated funding for sustainable infrastructure and adaptation investments.

One rapidly growing category of debt is green bonds. These have pricing and reputational benefits and good visibility compared with non-green bonds are quick to bring to the market and can send a strong signal of government commitment to net zero, increasing investor confidence in climate policies. Sovereign green bonds also provide benchmark pricing and liquidity for corporate issuers (Harrison & Muething, 2021).

Sub-sovereign finance is a further option. By 2050 two-thirds of the global population will live in urban areas (UN DESA, 2018) but local and municipal governments often do not have sufficient revenues to invest in sustainable infrastructure. Ministries of Finance can work with local governments to fill investment shortfalls.

Four key entry points for sub-sovereign finance are especially important for Ministries of Finance to consider: (i) Land-based financing instruments such as land value capture (LVC) to harness the interrelationships between productive use of land and rising land values for private financing of sustainable urban infrastructure such as mass transit systems; (ii) property taxes using flat rate or beneficial property taxes to fund and incentivize more compact, connected and coordinated urban development; (iii) municipal bonds or debt financing for raising upfront capital to finance sustainable urban infrastructure; and (iv) PPPs to secure private sector capabilities in the design, construction, management and financing of large sustainable infrastructure projects.

Barriers to action and strategies to overcome them

⁶ Based on Bloomberg Markets Data (14 July 2022). Outstanding debt with a maturity greater than or equal to one year.

- **While tax reform led by Ministries of Finance is often unpopular, a range of alternative forms of taxation can be explored**, including new forms of environmental taxation, motoring taxes, road pricing, property and land taxation and reforming general taxation (see Function 2 for more detail). Understanding the political economy of reform is fundamental to success.
- **In the shorter term it could be easier to increase tax collection and encourage compliance.** The operational strength of tax administration agencies and greater international cooperation on base erosion is positively associated with tax collection. Enhancing compliance of VAT can be an especially effective strategy (Gupta & Plant, 2019). **Rwanda** overhauled tax collection procedures and increased total tax revenues by a factor of 10 between 1998 and 2017. This has opened up fiscal space for investment in the new economy.
- **Drawing on further debt financing is currently a major challenge for some Ministries of Finance – especially low- and medium-income sovereigns – although there are grounds for optimism.** Global governments have allocated over US\$18 trillion in fiscal support to mitigate the economic effects of the COVID-19 pandemic (O’Callaghan et al., 2022), leading to a rise in global public debt. Moreover, interest rates are currently rising in almost all countries, placing further pressure on government budgets. Positively, there is some evidence to suggest that as long as that public debt is used for investment, it is unlikely to pose significant macroeconomic risks for certain countries. Many green investments can be self-financing in the medium to long term due to their growth-inducing impacts (Stern & Zenghelis, 2021) and investment in resilience can significantly reduce the threat of sovereign default (Cevik & Jalles, 2021). Moreover, despite the evident deterioration in creditworthiness, the issue appears not to be one of over-indebtedness or lack of solvency, but one of liquidity and roll-over problems (Songwe et al., 2022). Nevertheless, Ministries of Finance should always assess the affordability of taking on new forms of debt and potential impacts on inflation before proceeding.
- **There are good examples of countries using debt to finance green investment while others are revisiting their fiscal rules or using debt-for-climate swaps to enhance their fiscal space.** Belize made a debt-for-nature swap in 2021, buying back its debt at a significant discount in exchange for increasing marine conservation efforts. There have been many successful green and sustainability bond issuances, including Fiji, Chile, Netherlands, Nigeria, Thailand and Italy. **Peru’s** 2021 US\$3.25 billion Sustainability Bond issuance was the largest-ever Sustainability Bond from Latin America and the Caribbean (Harrison & Muething, 2021). These all overcame barriers to identifying expenditures, ringfencing proceeds, accessing international markets and identifying adequate fiscal space.
- **Many Ministries of Finance are working to support local governments to transform cities for better economic and climate outcomes.** In 2014 in **South Africa**, Johannesburg became the first sub-Saharan African city to issue a green bond for investment in sustainable urban infrastructure.

Opportunities for action

- **Ministries of Finance should think innovatively to identify new sources of tax revenue to drive investment for the net zero, 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 how to responsibly use public debt to support investment, including through green bonds, within a responsible macro-prudential framework.** This could include: (i) developing clearer and predictable fiscal rules that avoid placing artificial ceilings on debt service costs as a percentage of total government expenditures or GDP without taking account of the contribution of investment in green and resilient infrastructure to growth and net

worth; (ii) developing a green bonds framework with clearly defining investment priorities, impact reporting and software to integrate into the public investment system.

- **Ministries of Finance should 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. For example, they can identify the revenue sources most readily transferrable to fund sustainable urban infrastructure by local governments and introduce national land value capture and PPP frameworks.

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

Critical role of Ministries of Finance

Ministries of Finance are often major share or budget holders in publicly backed institutions including National Development Banks, Sovereign Wealth Funds and State-Owned Enterprises. There are currently more than 250 National Development Banks (NDBs) globally with assets in excess of US\$5 trillion. Over 70% of oil and gas production assets and 60% of coal mines and plants globally are state owned (IEA, 2020; OECD, 2021b). Of the 128 Sovereign Funds across 68 countries which collectively manage US\$9.3tn of assets, only 30% have a target to reduce emissions across their investments (Kyriakopoulou et al., 2021).

Depending on ownership structures and budget processes, Ministries of Finance can support these institutions to manage climate risks and act as anchor investors in the new economy. Some NDBs have already been providing financing for low-carbon, climate-resilient projects for many years such as **Germany's** KfW and Bancoldex, the Colombian Bank for External Commerce. In terms of SWFs, **Italy's** Cassa Depositi e Prestiti recently published a Green, Social and Sustainability Bond Framework. **Norway's** Government Pension Fund Global is taking steps to become world leading in responsible investment and Vattenfall, **Sweden's** state-owned multinational power company, recently sold its coal assets. This building momentum now needs to be accelerated.

In countries that do not have development banks, Ministries of Finance can create public green investment banks (GIBs) and GIB-like entities. The historic transformations of today's industrial powers demonstrate the powerful role that Ministries of Finance have typically played in creating specialized agencies to drive transformation and investment. GIBs and GIB-like entities have been successfully established in many countries at the national, state and city levels including in **Japan, Malaysia, Switzerland, the UK and California.**

Ministries of Finance can also work closely with central banks to drive climate action. Central banks usually manage sizeable reserve portfolios with collective assets under management at over US\$15 trillion globally including foreign exchange reserves, own funds, pension portfolios and third-party portfolios (Kyriakopoulou et al., 2021). While many central banks are embracing the climate action agenda, their roles to date have been largely constrained to their macro-prudential role in preventing the financial system becoming a major source of instability rather than helping to drive investment in the new economy. The need for enhanced central bank leadership is more prescient than ever before, therefore (including to catalyze investment in the renewable energy transition to support price stability).

Ministries of Finance can play a critical role in enabling central banks to accelerate climate action by clarifying their missions. Many Ministries of Finance have the power to update central banks' remits and responsibilities to bring them in line with governments' own net zero commitments, especially those with mandated objectives to support the economic priorities of their government (Dikau & Volz, 2021). They can use this to encourage central banks to factor climate change into their monetary

policy frameworks, macroeconomic modelling, eligibility criteria for lending facilities and screening of assets in purchases. On the prudential front they can require financial institutions to disclose their exposure to climate-related risks, stress testing the potential losses, adjusting capital requirements, or require mandatory transition plans (Dikau et al., 2022). They can also encourage central banks to develop strategies to leverage their reserve portfolio for sustainable investment. The **UK** represents an instructive case: the Treasury updated its remit letter in 2021 to enable the Bank of England to explore the implications of the Government's net zero commitment for its operations.

Barriers to action and strategies to overcome them

- **While many Ministries of Finance are in a position to play a role in shaping the strategies of NDBs, GIBs, SWFs and SOEs, there are a number of barriers to overcome.** These include shared ownership structures with other line ministries, minority shareholders and poor understanding of climate risks and opportunities by senior leadership. Fortunately, it is usually in the interests of publicly backed institutions to collaborate with Ministries of Finance on this journey to manage their own risks, fulfil their mandate and access new sources of international capital, although some can be highly protective of their independence. These start with strategic engagement with leadership teams at the board level and with other relevant ownership entities, in the spirit of partnership. Strategies to support this can include issuing investment guidelines, ensuring there are sufficient resources for institutions to measure and manage their portfolios' exposure to climate risks and reviewing management incentive structures.
- **Ministries of Finance may face strong resistance to increasing the role of NDBs in climate action or establishing GIBs** deriving from poor understanding of the economic case for climate action and sustainability of long-term funding. However, all of these issues are surmountable: for example, by exploring a wide range of funding sources for GIBs including use of general budgets, carbon tax revenues, utility surcharges, loans, bond issuances, or support from MDBs and RDBs.
- **Ministries of Finance may also face strong opposition to revisiting the remits of central banks,** understandable in the context of the movement towards central bank independence. However, it is clear that climate inaction poses a significant risk to the core priorities of many central banks. As the links between fiscal and monetary policy become ever clearer in the context of the current inter-linked crises, this presents an opportunity for Ministries of Finance to engage with central bank leadership in a spirit of partnership to evolve their role over time to meet current challenges.

Opportunities for action

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

- **Greening 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.
- **Where NDBs do not exist, considering the set-up of dedicated Green Investment Banks,** addressing establishment costs, level of independence, mandate and culture, financing approaches and level of investment risk before proceeding.
- **Updating central banks' remits and responsibilities to bring them in line with government climate commitments.** Beyond explicit direction on mandates, Ministries of Finance can consider climate expertise in central bank senior appointments, introducing investment objectives for reserves management, encouraging sovereign green bond issuance and new fiscal and monetary policy coordination mechanisms.

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

Critical role of Ministries of Finance

The private sector will need to provide a considerable portion of the capital for investment in the zero-carbon, climate-resilient transition. Ministries of Finance will therefore need to work with the financial and wider private sector to access deep pockets of capital. US\$130 trillion worth of private capital through the Glasgow Financial Alliance for Net Zero (GFANZ) is already committed to align its activities with net zero and is increasingly targeting Paris-aligned lending and investments (CPI, 2021). This represents capital from the banking sector, pension funds, private equity, investment schemes, capital and insurance markets. The 100-plus financial centers around the world can also play a major role in driving sustainable investment, from London to Paris, Hong Kong to Rio, Lagos to Cairo (FC4S, 2022; UN Environment Inquiry, 2017).

Ministries will need to work closely with central banks and financial supervisors to prevent the financial system from becoming a major source of financial instability. Physical climate and transition risks can impact domestic and global financial sectors in five main ways: (i) credit risk where climate-related risks reduce a borrower's ability to repay their debts; (ii) market risk where an abrupt transition scenario means financial assets lose their market value, leading to fire sales; (iii) liquidity risk, where banks' balance sheets hit by credit and market risks lead them to being unable to refinance themselves; (iv) insurance risk, where there are higher than expected insurance claim pay-outs due to physical risks; and (v) operational risk, where financial institutions are affected by their operations' direct exposure to climate-related risks.

Sustainable finance roadmaps are emerging as a way for Ministries of Finance to organize the different actors involved in sustainable finance around a common conception of their roles and responsibilities. These complement and build on the idea of roadmaps designed specifically for the financial sector. Spearheaded over the last decade by the UN, sustainable finance roadmaps provide recommended actions to enhance sustainable finance within and outside financial systems (UNEP/World Bank, 2017). More than 40 roadmaps have been drafted with public and private sector input and a leading role for Ministries of Finance (Coalition of Finance Ministers for Climate Action, 2021a), including **Australia's** Sustainable Finance Initiative (2020), the **UK's** Green Finance Strategy (2019), **Indonesia's** Sustainable Finance Roadmap Phase II (2021-2025) and **South Africa's** assessment of financing a sustainable economy.

Country platforms are another option for bringing together providers of multiple sources of finance in key sectors such as energy or transport, the key feature of which is the combination of political leadership to tackle a problem of broader global benefit such as phasing out coal or ending deforestation by a particular date, enabled by a significant package of concessional financing and coordination structures (Songwe et al., 2022). Country platforms are vehicles designed to coordinate and leverage private and other sources of finance at significant multiples. They 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. COP26 saw the launch of the International Just Energy Transition Partnership by **South Africa** with France, Germany, the UK, US and EU, who committed to US\$8.5 billion over the next 3–5 years.

Barriers to action and strategies to overcome them

- **Ministries of Finance face significant barriers to working with other actors across government to mobilize private capital for the transition.** Sustainable investments tend to be frontloaded, capital-intensive and subject to a range of risks. This usually means that some form of public investment or risk mitigation mechanism, backed by a vehicle for collaboration between actors, is

often required to help leverage private capital at significant multiples. These risks are especially acute in emerging markets and developing countries, which account for less than 6% of the US\$130 trillion in GFANZ (GFANZ, 2021).

- **Few Ministries of Finance have a sufficient understanding of the systemic risks to the financial system**, partly because of backward-looking risk assessment models that prevent full appreciation of future systemic risks and opportunities (Bolton et al., 2020). This is why it is so important for Ministries of Finance to work with line ministries, central banks, regulators and supervisors to identify and address the main climate-related risks to the financial sector. Ministries of Finance can also encourage their central banks and financial sector to participate in international networks to facilitate knowledge-sharing and collaboration such as the Central Banks and Supervisors Network for Greening the Financial System (NGFS), Task Force on Climate-related Financial Disclosures (TCFD) and Financial Centres for Sustainability (FC4S).
- **Developing sustainable finance roadmaps can be effective for helping Ministries of Finance work collaboratively to overcome the country- and sector-specific barriers to private finance.** Recent analysis by the Coalition for Finance Ministers and the UNDP Financial Centres for Sustainability (FC4S) network identifies key criteria for an effective sustainable finance roadmap (FC4S, 2022). Effective documents typically involve a broad consultative process, build a strong narrative for financial system alignment with the Paris agenda and SDGs and identify the agency or institution responsible for implementing each recommendation.
- **Blended finance instruments are one example of a mechanism that Ministries of Finance can consider to help address the specific risks that limit private investment flows.** In the absence of well-functioning markets where such risks would otherwise be mitigated or not arise in the first place, blended finance can overcome different categories of risk and help match risk-adjusted returns to investor requirements. Several governments, with active involvement or leadership from Ministries of Finance, have launched blended finance mechanisms. **Indonesia's** government has embraced blended finance to bridge the gap between investment needs and availability of public finance through platforms such as the Indonesia Infrastructure Guarantee Fund and SDG Indonesia One-Green Finance Facility (SIO-GFF).
- **Country platforms can also help to overcome the barriers to investment** but to do so, must be carefully designed. Challenges often include a lack of incentives for governments to take the lead; complex stakeholder coordination; low technical and implementation capacity; and potential constraints on the effective involvement of the private sector. 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.

Opportunities for action

To help raise, steer and blend private finance for investment at the speed and scale required, Ministries of Finance 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 could include measures such:

- Creating strong investment pipelines and building mechanisms for sustained engagement with the private sector.
- Enhanced use of blended finance initiatives to help address investment risks and realize the potential for public and multilateral finance to act as a catalyst for private finance.
- Working with other line ministries to establish country investment platforms in a small number of strategic priority areas such as ending coal use, phasing out fossil fuel vehicle use, ending deforestation, or investing in resilience.

- Working with central banks and financial regulators to encourage the development of sustainable financial centers through working with existing centers to channel their expertise to help deliver climate action and sustainable development.
- Working with line ministries, central banks, regulators and supervisors to identify and address the main climate-related risks to the financial sector.
- Encouraging central banks and financial sector actors to participate in international networks to facilitate knowledge-sharing and collaboration.
- Effective approaches for disaster risk financing and mobilizing international climate finance (see Function 3d).

Function 3d. Providing disaster risk financing for all

Critical role of Ministries of Finance

Ministries of Finance will play an ever-growing role in the provision of disaster risk financing and insurance in the decades ahead. The macroeconomic costs of natural disasters, including immediate decline in GDP growth and permanent GDP loss during the years following a major disaster, affect government budgets and can impact the livelihoods of millions. Globally it is estimated that the occurrence of at least one climate event per year is associated with a 0.8% increase in the fiscal deficit 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 involves public and private actors, successful risk financing and insurance measures are usually anchored in and driven by Ministries of Finance (World Bank, 2014). Disaster risk financing and insurance typically aim to strengthen the financial resilience of four different groups: national and local governments; homeowners and SMEs; farmers; and the poorest – through a combination of sovereign disaster risk financing, property catastrophe risk insurance, agricultural insurance and disaster-linked social protection.

Ministries of Finance should look to develop comprehensive risk finance and insurance strategies with the private sector and others. This can include considering establishing specialized fiscal risk management divisions, encouraging the development of disaster risk financing tools and markets and enhancing the financial capacity of insurance companies.

Barriers to action and strategies to overcome them

- **The use of disaster risk financing instruments requires a certain level of experience and capability for advance planning within the Ministry of Finance and wider government.** Supporting comprehensive and affordable insurance coverage of disaster risks across economies with varying levels of insurance market development is a particularly acute challenge, as is data availability and modelling capability. Success in establishing effective mechanisms is more likely to be assured with strong leadership by the Ministry of Finance with the private sector as an essential partner and disaster risk financing and insurance viewed as a long-term agenda.
- **While there are no simple answers to these challenges, a growing number of countries are leading the way.** In **Colombia, Indonesia, Panama** and **Peru**, the Ministries of Finance have established fiscal risk management divisions to identify, quantify and manage fiscal risks from natural disasters. **Jamaica** has a comprehensive disaster risk financing strategy led by the Ministry of Finance. Recently, four Pacific Alliance countries joined efforts and developed the issuance of a catastrophic risk insurance 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** (Eguino & Delgado, forthcoming).

Opportunities for action

- **Ministries of Finance should look to develop comprehensive risk finance and insurance strategies, as part of broader sustainable finance efforts.** This could include establishing specialized fiscal risk management divisions and strategies for engaging with the private sector.

Function 3e. Leveraging international climate finance and the global financial architecture⁷

Critical role of Ministries of Finance

Ministries of Finance in eligible countries can often draw on multilateral development banks (MDBs) and development finance institutions (DFIs) to provide finance to support their sustainable investment strategies. The finance provided often has long maturities, low interest rates and preferred creditor treatment. These institutions can combine loans with grants, technical assistance and policy and institutional guidance and play a countercyclical role during downturns. The IMF recently established the Resilience and Sustainability Trust (RST), with a target base of US\$42 billion, to help countries build resilience and ensure sustainable growth (IMF, 2022b). International and bilateral official development assistance (ODA) worth over US\$179 billion globally can also be used to support climate investments in poor and vulnerable countries (OECD, 2021a).

Ministries of Finance who are major shareholders in the MDBs, including regional development banks, can call for enhanced support for climate action. Working hand-in-hand with foreign Ministries and development agencies, they can encourage the MDBs to stretch their current balance sheets. One calculation suggests the major MDBs could raise lending by US\$750 billion with no change in credit rating (Humphrey, 2022). They can also call for proactive capital increases by the global community for the International Development Association (IDA) and Climate Investment Funds (CIF) as well as in under-resourced regional development banks.

Voluntary carbon markets represent a potential innovative source of debt-free finance that Ministries of Finance can explore for decarbonization, especially for emerging markets and low-income countries (Bhattacharya et al., 2021). Under the Paris Agreement Article 6, countries can attract carbon finance for target projects that may be challenging for other actors to reach, such as for integrated forest management, deploying clean cookstoves, or decommissioning coal power plants. Several countries in the Congo Basin are developing a harmonized framework for issuing carbon credits that could attract substantial investment for activities that prevent deforestation.

Barriers to action and strategies to overcome them

- **Many eligible countries are not yet well equipped to receive 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. Combined with often challenging MDB and bilateral donor access requirements and different MDBs and donors with different geopolitical motivations, this acts as barrier to accessing finance.
- **Ministries of Finance should therefore take steps to enhance their capacity – 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. Ministries of Finance can establish a dedicated coordination entity, often called a Climate Finance Unit (CFU), within the Ministry of Finance or key sectoral ministry, and can enhance or establish new financial vehicles to ensure resources are effectively and

⁷ There are many 'live' debates and ongoing work in this space, which will be reflected in our work in due course.

transparently managed. **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.

- **Ministries of Finance need to act cautiously when harnessing the potential of carbon markets, which requires strong governance and institutional capacity** (Florini & LaForge, 2021). Transparency around the impact of investments is especially essential to build confidence among buyers and attract investment. It is equally essential to have robust mechanisms for ensuring that governments or investors buying credits are not 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.

Opportunities for action

Ministries of Finance – especially in ODA-eligible countries – should leverage international climate finance and encourage the strengthening of the global financial architecture by:

- Working with their Development Ministries to develop international climate finance strategies that lay out the investment gaps for a country to achieve its NDC and Long-term Strategy with key actions to address these needs.
 - Proactively calling 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 (SDRs). Shareholders and other countries should continue to encourage an increase in international climate finance, especially concessional finance and finance for adaptation investments.
 - Proactively considering what contribution voluntary carbon markets can make to their net zero investment plans by filling gaps in the existing landscape of climate and development finance while paying particular attention to the significant risks, appropriate safeguards, and the need to ensure additionality, noting the recent recommendations of the Science-based Targets Initiative (SBTi, 2021).
-

Cross-cutting. Just transition and the role of Ministries of Finance

Ministries of Finance will only be able to reap and sustain the full economic and wider benefits from the net zero, climate-resilient transition if it is a just one. 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. 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, and ensuring that those affected by the transition are involved in shaping it.

Without a just transition, it will be impossible to sustain public support for climate policies or reap the full net benefits. Protests against reducing energy subsidies in developing countries, the *Gilets Jaunes* movement in France that rejected the government's plans to increase fuel taxes, and the failure in many countries to retrain coal workers and generate employment in other industries have illustrated the challenges and lost benefits facing governments that do not adequately consider social issues in policy design. The just transition is not a 'nice to have' afterthought, but a critical enabling factor for the successful shift to net zero (ILO, 2015; Robins, 2022).

How Ministries of Finance can support a just transition

Ministries of Finance should ensure that climate policies consider potential positive and negative social impacts and that affected stakeholders are included in decision-making: just transition plans can be a potentially useful vehicle for this. Common themes and sectors to consider include: (i) managing potential job losses in impacted sectors through regeneration and retraining schemes; (ii) managing energy subsidy and carbon pricing reforms through targeted social-protection measures and ways to ensure revenues are rerouted towards job creation and sustainable infrastructure provision; (iv) resilience and adaptation policies that ensure that all are protected against climate risks; and (v) policies to incorporate the just transition into financial standards and regulation.

Emerging examples of good practice can inform and guide Ministries of Finance and other key line ministries, especially in the energy sector, including: Canada's effort to mitigate the negative social impact of its coal plants phaseout plan; **South Africa's** Just Transition Transaction, which provides a mix of mitigation and retraining of workers in the state utility Eskom; the **EU's** Just Transition Mechanism provides a tool to ensure that the transition in Europe does not leave anyone behind **Ireland** provides a strong example of how to link carbon taxation to the just transition.

Opportunities for action

- **Ministries of Finance should work with other line ministries and stakeholders to develop just transition plans and policies for all key sectors of the economy. Climate policies must consider potential positive and negative social impacts and affected stakeholders must be included in decision-making.**

Capability 1. Leadership and governance for driving climate action

[Helsinki Principle 2]

Ministries of Finance need to underpin enhancing their core functions with sustained increases in their leadership capability. This is critical to ensure climate change considerations are prioritized and mainstreamed in the work of the Ministries and should be supported by a clear mandate, strategy and effective institutional arrangements.

Significant institutional barriers may challenge Ministries of Finance in fulfilling their leadership role in driving climate action, which could include: (i) a *lack of commitment to climate change objectives* at senior management level in the Ministry of Finance and lack of internal strategy on climate change which has implications for allocating resources; (ii) a *lack of clarity on the overall mandate of the Ministry of Finance* on climate change and its role in related national processes; (iii) *competing priorities pushing climate action into the background without attention to how climate action can help achieve these objectives*, which makes it challenging to maintain climate as a priority area that requires investment; (iv) *ambiguity in internal responsibility for climate change*, which leads to insufficient attention to climate action, duplication and challenging relationship with line ministries; (v) a *lack of trust among partners* inside and outside government, based on doubts that the Ministry of Finance can give sufficient attention to climate alongside traditional economic and fiscal policy objectives.

How Ministries of Finance can overcome barriers to enhancing capability

To help drive strong relationships with other agencies and to mobilize internal capacity it is helpful for Ministries of Finance to clarify their own mandates and objectives and/or develop an internal strategy for driving climate action. Based on their core mandate of protecting fiscal health and sustainable economic growth of the economy in their respective countries, Ministries of Finance already have an implicit obligation and authority to act on climate change. Some Ministries have a mandate specifically outlining an obligation to act (e.g., via a climate law or governmental order for all agencies to address climate change). However, the Ministry of Finance itself can initiate clarification of its mandate to explicitly include climate change. This can be done via a mission statement, including climate change objectives into the internal Ministry's strategy, or through developing a specific internal strategy focused on climate change.

Having specific objectives on climate enables Ministries of Finance to get internal buy-in into the agenda and assess the required expertise, resourcing and the best institutional set up. Where there is a clear mandate, there is also an authority to act. Explicit mandates on climate change help ensure that there are resources, expertise and capital. In countries that lack 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 action by other Ministries.

A number of countries are introducing changes to the Ministry of Finance's mandate to explicitly address climate change. In some countries mandate changes were made from the top, following an adoption of a climate law or as a result of a 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 others, personal leadership by the Minister was the driving factor (e.g., **Malaysia**). **The Danish** Ministry changed its mission statement to include climate and environmental development as a top-level objective alongside traditional fiscal and economic priorities.

Organizational strategies on climate change can help Ministries of Finance operationalize the overall mandate into a set of concrete climate change objectives and actions required to support them. Internal strategies help to set out internal priorities and create internal buy-in for the objectives and actions; designate responsibility for delivering and coordinating climate change-related work internally; signal the Ministry's commitment and role in overall climate governance to other departments and stakeholders; and determine the capabilities needed and how they can be built internally and through external partnerships. Ministries of Finance can also use internal strategies to set out how they plan to ensure the sustainability of their own operations. A growing number of Ministries of Finance have integrated climate change into their strategy (e.g., **Ireland, Finland and New Zealand**). Some already have dedicated climate strategies that provide more detail on priorities and planned activities (e.g., **Chile and US**).

Strengthening Ministry of Finance engagement on climate change can be accelerated by reforming internal institutional set-ups: it is especially important to ensure dedicated internal capacity for climate change. 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. Effective processes for internal and external collaboration are essential to tap into relevant expertise and knowledge distributed among internal teams and external stakeholders.

At the minimum a Ministry of Finance needs to have designated and qualified staff who consistently act as focal points on climate change, decarbonization and climate resilience issues. Smaller Ministries or those with resource constraints have been identifying existing staff with relevant expertise and adjusting their responsibilities to introduce climate change. Other Ministries have been creating dedicated climate units combining redeployment of existing staff and recruitment of experts,

which has contributed to creating internal capacity, increased overall awareness among staff and enabled better coordination and more effective response (e.g., in **Denmark, Fiji and Ireland**). Alternatively, a hybrid approach can be used where a small team coordinates work on climate, with the bulk of work being done within the existing teams (e.g., **the US Climate Hub**).

Opportunities for action

- **Ministries of Finance should build their leadership capabilities by establishing clarity on their top-level political priorities for climate action, communicating them clearly internally and externally and mobilizing capacity through clear institutional arrangements and responsibilities on climate change.** Ministries of Finance should consider: (i) developing their own explicit mandate with respect to driving climate action, including through modifying the current mandate or strategy; (ii) developing and publishing an organizational strategy on climate change; (iii) designating clear responsibilities for coordination and delivery of climate change-related work internally and collaboration and coordination with other departments and stakeholders; (iv) determining the capabilities needed to meet the climate objectives and a plan for building this internally and externally; (v) ensuring the sustainability of their own operations.
- **Ministries should consider reforming internal institutional arrangements to ensure dedicated capacity for climate change issues.** This could include setting up effective processes for internal and external collaboration, ensuring clear responsibilities for key areas of work, and having designated and qualified staff who act as focal points. Where resources permit, dedicated climate units combining redeployment of existing staff and recruitment of new experts should be considered; alternatively, a small team can be dedicated to coordinating climate work.
- **Ministries of Finance should seek opportunities to capitalize on synergies in addressing competing priorities (perceived or actual)** due to the current multiple crises (e.g., energy, climate and cost of living). They should coordinate with other agencies on a unified and well communicated response across government and with external stakeholders and the wider public.

Capability 2. Coordination and collaboration for whole-of-economy climate action

[Helsinki Principles 2 and 4]

Climate issues are by nature horizontal, covering all sectors of the economy, and nearly always with significant economic and fiscal impacts and trade-offs. Cooperative and coordinative efforts through a whole-of-government approach will be critical to solving the complex policy challenge of climate action.

Effective climate coordination is important for achieving successful implementation of national climate objectives and requires engagement by multiple stakeholders across policy areas and sectors. Ministries of Finance should seek to promote a collaborative approach, working closely with the Heads of State, Ministries of Environment, Planning, Energy, Transport and other relevant institutions. Being proactive in the areas of direct and shared responsibility will be critical. Inter-ministerial coordination is particularly important to avoid duplication of tasks, to identify and cover potential policy gaps, and to improve buy-in from sectoral line agencies into climate change objectives and policies. It also enables sharing and building on relevant expertise spread across agencies. Coordination and collaboration with non-governmental stakeholders, such as civil society, the private

sector, and the international finance and expert community, will similarly be critical for improving the quality and support for climate policy proposals.

Enhancing the collaboration capabilities of Ministries of Finance to drive climate action is especially challenging for several reasons. The most pertinent challenges typically include: (i) *a lack of horizontal policy alignment* and a disparity between climate change goals and the objectives specified in strategic documents setting the economic development agenda; (ii) *ambiguity of mandates and distribution of responsibilities* on climate change among agencies creates potential duplication and institutional conflicts over decision-making; (iii) *the Ministry of Finance not being at the table or engaged in a meaningful way when key climate strategies and policies are being developed*; (iv) *mistrust of public-private engagement* due in some countries to the private sector being reluctant to engage in consultations given skepticism and general mistrust in public bodies; (v) *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; (vi) *insufficient coordination on international financing and funding requirements* leads to disparate approaches in different sectors, creating challenges for financing and signaling uncertainty for investors; and (vii) *challenges in the relationships between Ministries of Finance and of the Environment* due to the differences in subject matter expertise and perspectives.

How Ministries of Finance can overcome barriers to enhancing capability

Many coordination challenges can be addressed through clarifying the respective mandates among the agencies and adapting the mandate or the objectives of the Ministry of Finance to include climate action. Ministries of Finance taking a clear role and participating actively in inter-agency coordination and collaboration mechanisms on climate change can be especially important for improving climate policy alignment and coherence and can lead to more informed cross-sector policy decisions and ensure a whole-of-government approach. Collaboration also helps maximize mutual capacities and build on joint expertise. Feedback mechanisms should be introduced in the coordination and consultation mechanisms 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 be transparent on the next steps.

Recognizing their mutual differences in backgrounds, relative strengths and constraints should help Ministries of Finance to improve collaboration with Ministries of Environment. It may be useful to consider 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 the expertise and learn from each other. This may also include Ministries of Finance joining international climate negotiations, especially on finance.

A growing number of Ministries of Finance are engaged in national climate change strategies and policies through participation in inter-agency coordination mechanisms. In some countries the Ministry of Finance plays a leading role in coordinating the whole-of-government response to climate change (e.g., in **Denmark**). Ministries of Finance are also engaging in collaboration and coordination with line ministries to develop and implement climate-related policies in key sectors (e.g., **Uruguay's** Commission for the Application of the Investment Law). **Jordan** has 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. The **US** whole-of-government approach to tackling the climate crisis includes a significant number of climate-related inter-agency processes involving the US Treasury.

Many Ministries of Finance are developing their own coordination mechanisms and/or participating in existing coordination mechanisms with other stakeholders, including the private sector, civil

society and at-arm's-length agencies. For example, some Ministries of Finance host working groups or roundtables on specific sustainable finance issues involving non-governmental stakeholders (e.g., **Chile, Ireland**).

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. This requires:

- Identifying areas requiring collaboration around national development and climate strategies, investment planning, macro and fiscal policy, financing, and the other key capabilities.
- Clarifying their mandate and developing objectives on climate change (as discussed in C1) and working with other agencies to clarify theirs.
- Participation of the Minister and Ministry of Finance in existing inter-ministerial coordination mechanisms and allocating resources accordingly.
- Ensuring internal governance arrangements within Ministries of Finance explicitly address intra- and inter-departmental coordination, as well as the engagement with non-governmental stakeholders.
- Expanding day-to-day working collaboration with line ministries and other stakeholders to maximize mutual capacities and build on joint expertise.
- Strengthening collaborative relationships between Ministries of Finance and Ministries of Environment, recognizing mutual differences in backgrounds and relative strengths.

Capability 3. Human capacity, expertise and economic decision-making tools *[Helsinki Principles 2 and 4]*

Capability 3a. Enhancing skills and expertise

Climate change is a fast-paced and relatively new policy issue for Ministries of Finance: thus, many lack the relevant subject matter expertise and staffing capacity to drive the transition to net zero and enhanced resilience. The skills and capability challenges that most Ministries of Finance are faced with are: (i) limited awareness of climate change issues within the Ministry; (ii) a shortage of dedicated staff; (iii) cross-cutting and subject-specific skills gaps; and (iv) gaps in relevant tools and modelling approaches (Coalition of Finance Ministers for Climate Action, 2022d). The latter point is discussed under Capability 3b.

How Ministries of Finance can overcome barriers to enhancing capability

There is both a need for all staff to have basic awareness and understanding of climate issues and how they affect the work of the Ministry, and for dedicated climate staff to acquire a blend of specialist and cross-cutting skills. Yet, **attracting and retaining skills and expertise is challenging for many Ministries of Finance, particularly those in developing countries.** Key barriers include difficulties in setting up in-house training programs, the price and availability of training courses, low staff retention, and difficulties in establishing sustainable cooperations with external knowledge providers.

There are several ways Ministries of Finance can expand their skillsets and fill gaps in expertise. Given the constantly changing state of knowledge related to climate science and climate solutions a combination of approaches will be required. Options include: (i) hiring climate specialists; (ii) providing

training; (iii) engagement with knowledge and peer-to-peer learning networks, including the Coalition; (iv) engagement with academia and other research providers; (v) bilateral exchanges between Ministries from different countries; and (vi) leveraging expertise from government agencies and line ministries.

Ministries of Finance can benefit from a growing number of training programs offered online or in person by international institutions, universities or the Coalition of Finance Ministers. They can work with bilateral donors, international financial institutions and short-term consultants to fill specific knowledge gaps or implement discrete projects while ensuring this creates learning opportunities for permanent staff. They can engage in regional learning and exchange networks, benefiting from interaction between countries facing similar challenges and with similar existing capabilities and resources. They can devise a range of mechanisms to draw in knowledge from the external research community through commissioning reports or advisory committees. For instance, the **Irish** Department of Finance and the Economy has had a Joint Research Programme with the Social Research Institute since 2015, while the **Danish** Ministry of Finance is serving as secretariat for a commission of external experts tasked with developing proposals for green polices.

Fixing skill and staffing gaps and building systems that allow for the regular expansion of knowledge will require sustained efforts by Ministries of Finance. Ministries of Finance should assess skills and capacity gaps to design skill upgrading plans targeting both the training needs of dedicated climate staff and other Ministry staff considering the measures listed above. The **US Treasury** is currently developing a Climate Literacy Program to increase climate change knowledge and expertise of all staff, part of a broader plan to build ‘Rebuilding Program Capability’, departments one of the priority adaptation action areas outlined in its Climate Action Plan (see Capability 1), which also foresees that each bureau takes stock of current skills and develops bureau-level climate action plans. To improve the availability of training and knowledge exchange opportunities, Ministries of Finance should also consider engaging proactively with training providers to share their needs and expanding peer-to-peer learning opportunities.

Opportunities for action

- **Ministries of Finance should invest in developing and utilizing new skills and expertise to drive climate action through recruitment, in-house training, engagement in peer-to-peer networks, academia and other knowledge providers, and leverage expertise from other agencies.**
- Cross-cutting skills include climate science and risk management, climate economics, sector-specific expertise, stakeholder engagement, and climate law. More specific skills include expertise on carbon and other environmental taxation, sector-specific fiscal incentives, subsidy reform, infrastructure financing, financial sector services, debt and bond instruments, and MDB/DFI policies. Those critical for the just transition include socioeconomic, regional development and social security reform.
- In addition, Ministries of Finance should consider expanding peer-to-peer learning, and creating regional or global network of research institutions that could support the work of Ministries of Finance, including Coalition members, and provide the necessary evidence base for driving drive climate action.

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

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

How Ministries of Finance can overcome barriers to enhancing capability

A major barrier to climate action is insufficient knowledge by Ministries of Finance of the positive and negative macro and fiscal impacts of the transition, which exacerbates risk aversion in investing in the new economy. These typically include a mix of (i) positive changes through new tax mechanisms, industries benefitting from the transition, new sources of exports, impacts on productivity, reduced subsidies, and reduced health expenditures; and (ii) 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.

Ministries of Finance will need to place an ever-greater emphasis on mainstreaming climate action within existing tools and/or developing new tools to support decision-making, supported by high quality data. This is principally about better understanding four things: (i) the impact of physical climate risk on the economy and public finances over time; (ii) the economic, social and financial costs and benefits of long-term decarbonization and resilience pathways; (iii) the economic, social and financial impacts of different policies; and (iv) the fiscal implications of the combined long-term economic, policy and financial changes.

Four main strands of decision-making tools can support Ministries of Finance in this journey: (i) macroeconomic tools that estimate economy-wide costs and benefits; (ii) climate-economy models that estimate physical climate impacts and the investments required to reach decarbonization targets; (iii) sector models that focus on sector-specific costs and benefits such as analysis of sunset versus sunrise industries; and (iv) policy and project appraisal tools that focus on the direct and indirect impacts of major policies or large-scale investment programs and projects at a single or several points in time. All these approaches have their uses, advantages and disadvantages, but it is critical that Ministries of Finance are cognizant of the risks to using older approaches.

The Coalition of Finance Ministers has provided a comprehensive overview of current approaches to modelling the fiscal impacts of climate action (Coalition of Finance Ministers for Climate Action, 2022b), looking at approaches taken by **Denmark, Canada, Finland, and the UK**, among others. **Emerging evidence suggests that Ministries of Finance should be especially cautious about using older forms of macroeconomic and climate-economy modelling tools such as Computable General Equilibrium Models (CGEs) and Integrated Assessment Models (IAMs)**, which tend to underestimate the risks of climate change and the opportunities of a transition to net zero, albeit some IAMs are exclusively energy system models. 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, 2022, forthcoming).

Traditional approaches to assessing climate policy impacts such as cost-benefit analysis (CBA) are increasingly viewed as being insufficient guides for future economic and fiscal strategy. Some of the world's greatest successes in low-carbon sector transitions in countries as diverse as India, Brazil, China, Germany, and the UK were achieved by policies generally *not* supported by traditional analysis (such as CBA) or advice (Diaz Anadon et al., 2021, 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. But over time they proved highly effective. Alternative approaches are emerging, such as the risk-opportunity approach, that seek to tackle the status quo bias in CBA analysis.

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. Uganda factored green investment into its macroeconomic model to inform new climate commitments.

When considering the development of their analytical capabilities and tools, Ministries of Finance should follow principles that include: (i) a diversity of tools and approaches; (ii) matching the approach to Ministry of Finance capability; (iii) transparency and ease of explaining the results to leaders and senior decision-makers; and (iv) scenario and sensitivity analysis, especially around discount rates and future technological costs and benefits. In simple terms: use many approaches, make them simple and transparent, and ‘do’ scenarios. When using macroeconomic models, it is especially important that Ministries of Finance ensure they can factor in the processes of transformative change and disequilibrium processes, non-linearity and uncertainty in physical and economic impacts, technological innovation, equity and justice, and the empirical validity 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.

Ministries of Finance face a wide range of barriers to enhancing their analytical capability: while there are ways to overcome a number of these challenges, doing so is a process that is likely to be iterative and will need to adapt over time. Key aspects might include assessing the most pertinent questions to address before making major investments in new capability, gathering data, hiring and maintaining specialists, investing in partnerships, and starting off with simple models and approaches.

Ministries of Finance should consider investing in new approaches to national accounting that are helping countries to redefine their priorities for economic prosperity. These tend to focus on a fundamental reappraisal of the primary benchmarks of economic performance used by Ministries of Finance by going beyond GDP to include a wider range of metrics important for human wellbeing.

Opportunities for action

- **Ministries of Finance should invest in a range of decision-making approaches, in partnership with line ministries, to make effective choices on climate policy and investment.** They should consider investing in (i) their in-house analytical capabilities to assess climate and transition impacts; (ii) country and sector studies looking at the costs, benefits and fiscal impacts of different pathways; and (iii) providing training in dynamic systems analysis.
- **They should take into account the shortcomings of traditional general equilibrium and CBA approaches** by capturing non-linear climate impacts and non-marginal changes and experimenting with new approaches such as risk-opportunity frameworks.
- They should consider investing in **new indicators of economic prosperity** to avoid GDP serving as the primary compass on which to base investment and budget decisions and 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 action. No matter how well resourced, all Ministries of Finance will have to prioritize and sequence the steps they take and consider the unique context in which they each operate. Some Ministries will be able to build their capabilities and drive transformational reform across all the key areas outlined in this report. Others 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.

Ministries of Finance tend to differ from one another in several key ways. These include:⁸

- **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 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. 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

⁸ 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 Ministers and Ministries of Finance

Whatever the context, the direction of travel should be towards more active leadership by Ministries of Finance. We identify below 15 transformative actions 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 prioritized based on the importance of efforts by Ministries of Finance to reform their own capabilities to be fit for purpose and are based on the core functional areas in which Ministries of Finance typically have primary responsibility.

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**.

Authors and Acknowledgements

This report has been a collaborative effort of more than 30 organizations. Our warm thanks go to the many Coalition members, partners, and other individuals and organizations who have shaped and directly contributed to this report.

Country Steering Group

Ministry of Finance staff from the following Coalition member countries form part of the Country Steering Group: Bahamas, Chile, Denmark, Egypt, EU Commission, Finland, Indonesia, Ireland, Jamaica, Malaysia, Rwanda, Spain, Uganda, United Kingdom, United States, Uruguay.

Expert Advisory Group

Andrew Blazey (OECD), Bella Tonkonogy (CPI), Dileimy Orozco (E3G), Gaia Larsen (WRI), Huascar Eguino (IDB), Joaquim Leite (NDC Partnership), Katherine Stodulka (Systemiq), Malado Kaba (Falémé Conseil), Marcela Jaramillo (Pathway 2050), Mark Miller (ODI), Murray Petrie (Senior consultant to multiple global agencies), Peter Murphy (Senior consultant to IMF), Philipp Krause (University of the Witwatersrand), Richard Allen (Senior consultant to IMF, World Bank, WHO, IDB, OECD), Sanjeev Gupta (CGD), and Sujala Pant (UNPD).

Report Preparation

This report has been prepared by Nick Godfrey, Anika Heckwolf, and Alina Averchenkova (Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science) with guidance and support from Amar Bhattacharya (Brookings Institution) and Lord Nicholas Stern (Grantham Research Institute). The authors have benefited from research assistance from Oleksandra (Sasha) Plyska and editing by Georgina Kyriacou.

Contributing authors

Rodolfo Bustamante, Carola Moren (Ministry of Finance, Chile); Lily Burge, Sean Kidney and Vangelis Papakonstantinou (CBI); Dimitri Zenghelis (CISL); Chavi Meattle, Nicole Pinko and Bella Tonkonogy (CPI); Mads Libergren (Ministry of Finance, Denmark); Nicola Gagliardi, Simona Pojar and Diane Radu (European Commission); Dileimy Orozco (E3G); Aaron Drayer (GGGI); Ishak Diwan, Martin Kessler and Yoman Mohei Eldin (Finance for Development Lab); Pekka Moren and Matias Partanen (Ministry of Finance, Finland); Simon Dikau, Catherine Higham, Johannes Honneth, Danae Kyriakopolou, Sabrina Muller, Timothy Randall, Antonina Scheer, Joana Setzer, Eleonore Soubeyran, Swenja Surminski and Charlotte Taylor (Grantham Research Institute); Richard Allen, Peter Murphy and Murray Petrie (Senior Consultants to IMF / other organizations); Huascar Eguino and Raul Delgado (IDB), David Owens, Paul Ryan (Department of Finance, Ireland); Youngsun Koh (Ministry of Finance, South Korea), Keenan Falconer, Trevor Anderson and Anaitee Mills (Ministry of Finance, Jamaica); Joaquim Leite (NDC Partnership); Mark Millar (Overseas Development Institute); Marcela Jaramillo (2050 Pathways Platform); Katherine Stodulka (Systemiq); Sam Mugume (Ministry of Finance, Planning and Economic Development, Uganda); Sujala Pant (UNDP); Marcelo Cafferera, Juan Chaves, Clara Ferragut (Ministry of

Economy and Finance, Uruguay); Damian Richardson, Matthew Aks and Victoria Gunderson (US Treasury); Amanda Janoo (WeAll); Sam Moon and Samantha Power (World Bank); Natalia Alayza, Molly Caldwell, Claudio Forner and Caitlin Smith (WRI); Renilde Becque (independent consultant, WRI), Simon Sharpe (COP26 Champions Team).

Reviewers (in addition to reviews also undertaken by contributing authors above)

Esmyre Javier (ADB), Emily Keenan (MoF Canada), Timothy Randall, Josue Tanaka (Grantham Research Institute), Tómas Brynjólfsson (MoF Iceland), Camilla Toulmin (IIED), Aziz Almuzaini, James Brumby, Tatiana Falcao, Kayenat Kabir and Jean-Francois Mercure (World Bank).

Other consultations

The report has benefitted from a range of consultation processes on its emerging findings with Coalition members, members of the Coalition Secretariat, and other experts. We would especially like to thank Matias Partanen and Sara Tolonen (MoF Finland), Mart Kivine, Fiona Stewart, Abdulaziz Almuzaini, Ivana Ticha, Samantha Power and Benjamin Holzman (Coalition Secretariat), Sam Moon, Tim Williamson, and Stephane Hallegatte (World Bank), James Roaf, Ian Parry, and Simon Black (IMF), Carter Brandon and Claudio Forner (WRI), Hans Peter Lankes and Andreas Velasco (Grantham Research Institute), Emma Walsh (Oxford Martin), who provided advice at the early stages of concept development.

Disclaimer and Copyright

This work is a product of the Coalition of Finance Ministers for Climate Action ('the Coalition') and was prepared at the request of the Co-Chairs and Members of the Coalition. The views, findings, interpretations, and conclusions expressed are a synthesis of the diverse views of the authors, contributors and reviewers. While many Coalition members and partners may support the general thrust of the arguments, findings, and recommendations made in this report, they do not necessarily reflect the views of the Coalition, its members, or the affiliations of the authors, nor does this report represent an endorsement of any of the views expressed herein by any individual Member.

This work may be reproduced, in whole or in part, for non-commercial purposes provided full attribution to this work is given.

©2022 The Coalition of Finance Ministers for Climate Action

All rights reserved.

Website: www.financeministersforclimate.org

References

- Alejos, L. (2018). *Three Essays in Public Finance in Developing Countries*. University of Michigan.
- Allen, R., Hurcan, Y., Murphy, P., Queyranne, M., Yläoutinen, S., & Ylaoutinen, S. (2015). *The Evolving Functions and Organization of Finance Ministries*. IMF Working Paper WP/15/232.
- Allen, R., Hurcan, Y., & Queyranne, M. (2016). *The Evolving Functions and Organization of Finance Ministries*.
- Altenburg, T., & Assmann, C. (2017). *Green industrial policy. Concept. Policies. Country experiences*. Geneva, Bonn: UN Environment; German Development Institute (DIE).
- AON (2021) *Global Risk Management Survey 2021*. London: AON.
- Benedek, D., Gemayel, E., Senhadji, A., & Tieman, A. (2021). *A Post-Pandemic Assessment of the Sustainable Development Goals*.
- Bhattacharya, A., Dooley, M., Kharas, H., & Taylor, C. (2022). *Financing a big investment push in emerging markets and developing countries for sustainable, resilient and inclusive recovery and growth*. London: Grantham Research Institute on Climate Change and the Environment.
- Bhattacharya, A., Ivanyina, M., Oman, W., & Stern, N. (2021). *Climate Action to Unlock the Inclusive Growth Story of the 21st Century, WP/21/147, May 2021*.
- Bird, N., Monkhouse, C., & Booth, K. (2018). *10 propositions for success Integrating international climate change commitments into national development planning*. CDKN.
- Bolton, P., Despres, M., Pereira da Silva, L. A., Svartzman, R., Samama, F., & Bank for International Settlements. (2020). *The green swan: Central banking and financial stability in the age of climate change*. IBS.
- Bosio, E., & Djankov, S. (2020, February). *How large is public procurement?*
<https://blogs.worldbank.org/developmenttalk/how-large-public-procurement>
- Cevik, S., & Jalles, J. T. (2021). *An Apocalypse Foretold: Climate Shocks and Sovereign Defaults*. IMF Working Paper 20/231.
- Coalition of Finance Ministers for Climate Action (2020a). *Long-Term Strategies for Climate Change. A review of country cases*.
- Coalition of Finance Ministers for Climate Action (2020b). *Ministries of Finance and Nationally Determined Contributions. Stepping Up for Climate Action*.
- Coalition of Finance Ministers for Climate Action (2021a). *An analysis of sustainable finance roadmaps: charting the path to financial system transformation coalition of finance ministers for climate action*.
- Coalition of Finance Ministers for Climate Action (2021b). *Building Momentum for a Strong Recovery and Sustainable Transformation*.
- Coalition of Finance Ministers for Climate Action (2022a). *Climate Change Adaptation and the Role of the Coalition of Finance Ministers for Climate Action*.
- Coalition of Finance Ministers for Climate Action (2022b). *Driving Climate Action through Economic and Fiscal Policy and Practice*. www.financeministersforclimate.org
- Coalition of Finance Ministers for Climate Action (2022c). *Ministries of Finance and Nationally Determined Contributions. Raising Ambition and Accelerating Climate Action*.
- Coalition of Finance Ministers for Climate Action (2022d). *Strategies for Mainstreaming Climate Action in Ministries of Finance: Governance, Capacities, and Research Practices*.
- CPI (2022). *Global Landscape of Climate Finance: A Decade of Data*.
- Delgado, R., Eguino, H., & Pereira, A. L. (2021). *Fiscal Policy and Climate Change: Recent Experiences of Finance Ministries in Latin America and the Caribbean* (R. Delgado, H. Eguino, & A. Lopes, Eds.). Washington, DC: Inter-American Development Bank.
- Diaz Anadon, L. (2021). *Ten principles for policymaking in the energy transition: lessons from experience*. EEIST.
- Dikau, S., Robins, N., Smoleńska, A., van 't Klooster, J., & Volz, U. (2022). *Net zero transition plans: A supervisory playbook for prudential authorities*. London: Grantham Research Institute on Climate Change and the Environment.
- Dikau, S., & Volz, U. (2021). *Central bank mandates, sustainability objectives and the promotion of green finance*. *Ecological Economics*, 184, 107022.
- Eguino, H., & Delgado, R. (forthcoming). *Towards fiscal policy for resilience and decarbonization*. Washington, DC: Inter-American Development Bank.

- ETC (forthcoming). Degree of Urgency: Accelerating Action to Keep 1.5C on the Table.
- FC4S (2022). Leading Financial Centres Stepping Up Sustainability Action.
- Florini, A., & LaForge, G. (2021). Carbon markets are booming. Here's how to ensure they work. Thomas Reuters Foundation. <https://news.trust.org/item/20211130105941-kq31u/>
- Fuller, R., et al. (2022). Pollution and health: a progress update. *The Lancet Planetary Health*, 6(6), 535–547.
- GFANZ (2021). The Glasgow Financial Alliance for Net Zero. Our progress and plan towards a net-zero global economy. 2021 Progress Report.
- Global Commission on Adaptation (2019). Adapt now: A global call for leadership on climate resilience.
- Gupta, S., & Plant, M. (2019). Enhancing Domestic Resource Mobilization: What are the Real Obstacles? Centre for Global Development. <https://www.cgdev.org/blog/enhancing-domestic-resource-mobilization-what-are-real-obstacles>
- Harrison, C., & Muething, L. (2021a). Sovereign Green, Social, and Sustainability Bond Survey. CBI.
- Hausmann, R., & Rodrik, D. (2003). Economic development as self-discovery. *Journal of Development Economics*, 72(2), 603–633.
- Heal, G., & Schlenker, W. (2019). Coase, Hotelling and Pigou: The Incidence of a Carbon Tax and CO₂ Emissions. NBER Working Paper 26086
- Heubaum H, Brandon C, Tanner T, et al. (2022) The Triple Dividend of Building Climate Resilience: Taking Stock, Moving Forward. Washington, DC: World Resources Institute.
- Humphrey, C. (2022). All hands on deck. How to scale up multilateral financing to face the Covid-19 crisis. London: ODI.
- IEA (2020). World Energy Outlook 2020. Paris: France
- ILO (2015). Guidelines for a just transition towards environmentally sustainable economies and societies for all. Geneva: ILO.
- IMF (2021a). Proposal for an International Carbon Price Floor among Large Emitters. Washington, DC: IMF.
- IMF (2021b). Strengthening infrastructure governance for climate-responsive public investment. IMF Policy Paper. Washington, DC: IMF.
- IMF (2022a). World Economic Outlook: Countering the Cost-of-Living Crisis. Washington, DC: IMF.
- IMF (2022b). Resilience and Sustainability Trust. <https://imf.org/en/Topics/Resilience-and-Sustainability-Trust>
- IMF/OECD (2021). Tax Policy and Climate Change. Report for the G20 Finance Ministers and Central Bank Governors.
- IPCC (2022). Climate Change 2022: Mitigation of Climate Change. Working Group III Contribution to the IPCC Sixth Assessment Report.
- Irena (2021, June 22). Majority of New Renewables Undercut Cheapest Fossil Fuel on Cost. <https://irena.org/newsroom/pressreleases/2021/Jun/Majority-of-New-Renewables-Undercut-Cheapest-Fossil-Fuel-on-Cost>
- Kling, G., Lo, Y. C., Murinde, V., & Volz, U. (2018). Climate Vulnerability and the Cost of Debt.
- Kornejew, M., Rentschler, J., & Hallegatte, S. (2019). Well Spent: How Governance Determines the Effectiveness of Infrastructure Investments. Washington, DC: World Bank.
- Kyriakopoulou, D., et al. (2021). Global Public Investor 2021.
- Lankes, H. P., Soubeyran, E., & Stern, N. (n.d.). Acting on climate and poverty: if we fail on one, we fail on the other. London: Grantham Research Institute on Climate Change and the Environment.
- Mazzucato M (2021) Mission Economy: A Moonshot Guide to Changing Capitalism. Penguin UK.
- Mikheeva, O., & Ryan-Collins, J. (2022). Governing finance to support the net-zero transition: Lessons from successful industrialisations. UCL IIPP. Working Paper 2022/01.
- Murphy, P. (forthcoming). Some perspectives on Public Financial Management Systems and Climate Change.
- NDC Partnership (forthcoming). NDC Investment Planning: Best Practice Brief.
- New Climate Economy (2018). Unlocking the inclusive growth. Story of the 21st century: Accelerating climate action in urgent times. www.newclimateeconomy.report
- O'Callaghan, B., Yay, N., & Murdock, E. (2022). Global Recovery Observatory. Oxford University Economic Recovery Project. <https://recovery.smithschool.ox.ac.uk/tracking/>
- OECD (2014). The Cost of Air Pollution. Health Impacts of Road Transport. Paris: OECD.
- OECD (2018). Developing Robust Project Pipelines for Low-Carbon Infrastructure. Paris: OECD. (2019). Greening heavy and extractive industries: innovation and fiscal implications. 2019 Green Growth and Sustainable Development Forum. Paris: OECD.

- OECD (2021a). ODA data and trends 2021. Paris: OECD. <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/official-development-assistance.htm>
- OECD (2021b). Ownership and Governance of State-Owned Enterprises: A Compendium of National Practices. Paris: OECD.
- OECD (2021c). Government at a Glance 2021. Paris: OECD.
- Okereke, C. (2021). Aligning Africa's Nationally Determined Contributions with their Long-Term National Development Plans. APRI. <https://afripoli.org/aligning-africas-nationally-determined-contributions-with-their-long-term-national-development-plans>
- Orozco, D., & Jaramillo, M. (2021). The centrality of ministers of finance in a changing climate. Finance functions of a government. London: E3G.
- Parry, I., Black, S., & Vernon, N. (2021). Still Not Getting Energy Prices Right: A Global and Country Update of Fossil Fuel Subsidies. IMF Working Paper Series 2021/236.
- Petrie, M. (2021). Environmental Governance and Greening Fiscal Policy. London: Palgrave Macmillan.
- Robins, N. (2022). Here's how to mobilize finance for a just transition and net zero. World Economic Forum. www.weforum.org/agenda/2022/06/here-s-how-to-mobilize-finance-for-a-just-transition-and-net-zero/
- Roezer, V., Surminski, S., Laurien, F., McQuistan, C., & Mechler, R. (2021). Multiple resilience dividends at the community level: A comparative study on disaster risk reduction interventions in different countries; Centre for Climate Change Economics and Policy Working Paper No. 385.
- Rosenbloom, D., Markard, J., Geels, F. W., & Fuenfschilling, L. (2020). Why carbon pricing is not sufficient to mitigate climate change—and how “sustainability transition policy” can help. Proceedings of the National Academy of Sciences, 117(16), 8664–8668.
- Rydge, J. (2020). Aligning finance with the Paris Agreement: An overview of concepts, approaches, progress and necessary action. London: Grantham Research Institute on Climate Change and the Environment.
- SBTi (2021) SBTi Criteria and Recommendations. TW-INF-02. Version 5.0.
- SEI, IISD, ODI, E3G, & UNEP (2021). The Production Gap Report 2021.
- Setzer, J., & Higham, C. (2022). Global trends in climate change litigation: 2022 snapshot. London: Grantham Research Institute on Climate Change and the Environment.
- Songwe, V., Stern, N., & Bhattacharya, A. (2022). Finance for climate action: Scaling up investment for climate and development. London: Grantham Research Institute on Climate Change and the Environment.
- Stern, N. (2022). A Time for Action on Climate Change and a Time for Change in Economics. The Economic Journal, 132(644), 1259–1289.
- Stern, N., Bhattacharya, A., Peter Lankes, H., Pierfederici, R., Rydge, J., Taylor, C., & Ward, B. (2021). G7 leadership for sustainable, resilient and inclusive economic recovery and growth An independent report requested by the UK Prime Minister for the G7. London: Grantham Research Institute on Climate Change and the Environment.
- Stern, N., & Zenghelis, D. (2021). Fiscal responsibility in advanced economies through investment for economic recovery from the COVID-19 pandemic. London: Grantham Research Institute on Climate Change and the Environment.
- SwissRe (2021). The economics of climate change: no action not an option. Zurich: SwissRe Institute.
- SystemIQ (2020). The Paris Effect: How the climate agreement is reshaping the global economy.
- UN DESA (2018). 2018 Revision of World Urbanization Prospects. <https://population.un.org/wup/>
- UNEP (2022a). Adaptation Gap Report 2022: Too Little, Too Slow. Climate adaptation failure puts world at risk.
- UNEP (2022b). Emissions Gap Report 2022: The Closing Window — Climate crisis calls for rapid transformation of societies.
- UNEP/World Bank (2017). Roadmap for a Sustainable Financial System.
- United Nations Environment Programme (2022). Emissions Gap Report 2022: The Closing Window — Climate crisis calls for rapid transformation of societies.
- Vivid Economics (2021). Net Zero Financing Roadmaps. <https://www.gfanzero.com/netzerofinancing/>
- Volz, U., Beirne, J., Ambrosio, N., Fenton, A., Mazzacurati, E., Renzhi, N., & Stampe, J. (2020). Climate Change and Sovereign Risk. London, Tokyo, Singapore, Berkeley: SOAS University of London, Asian Development Bank Institute, World Wide Fund for Nature Singapore, Four Twenty Seven.
- Way, R., Ives, M. C., Mealy, P., & Farmer, J. D. (2022). Empirically grounded technology forecasts and the energy transition. Joule, 6(9), 2057–2082.

- World Bank (2014). Climate change public expenditure and institutional review sourcebook. Washington, DC: World Bank.
- World Bank (2018). Groundswell: Preparing for Internal Climate Migration. Washington, DC: World Bank.
- World Bank (2021). Green Public Procurement: An Overview of Green Reforms in Country Procurement Systems. Washington, DC: World Bank.
- World Bank (2022a). Country Climate and Development Reports (CCDRs). Washington, DC: World Bank.
<https://www.worldbank.org/en/publication/country-climate-development-reports>
- World Bank (2022b). State and Trends of Carbon Pricing 2022. Washington, DC: World Bank.