



IMF POLICY PAPER

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IMF STRATEGY TO HELP MEMBERS ADDRESS CLIMATE CHANGE RELATED POLICY CHALLENGES: PRIORITIES, MODES OF DELIVERY, AND BUDGET IMPLICATIONS

IMF staff regularly produces papers proposing new IMF policies, exploring options for reform, or reviewing existing IMF policies and operations. The following documents have been released and are included in this package:

- A **Press Release** summarizing the views of the Executive Board as expressed during its July 16, 2021 consideration of the staff report.
- The **Staff Report**, prepared by IMF staff and completed on June 30, 2021 for the Executive Board's consideration on July 16, 2021.

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International Monetary Fund
Washington, D.C.



IMF Executive Board Discusses a Strategy to Help Members Address Climate Change-Related Policy Challenges

FOR IMMEDIATE RELEASE

Washington, DC – July 30, 2021: On July 16, 2021, the Executive Board of the International Monetary Fund (IMF) discussed a paper proposing a strategy to help members address climate change-related policy challenges.

The paper highlights macro-critical climate-related policy challenges that will confront all IMF members in the coming years and decades. For example, global warming is bound to undermine productivity and growth, affecting fiscal positions and debt trajectories. It will also impact asset valuations, with repercussions for financial stability. Further, climate change will redistribute income across the globe, which will influence trade patterns and exchange rate valuations. To live up to its mandate, the paper argues, the IMF needs to assist its members with addressing these challenges. Moreover, as a multilateral institution, the IMF can play a helpful role in facilitating policy coordination between countries to mitigate climate change.

The paper takes stock of climate-related activities in the IMF to date. It finds that the Fund has stepped up engagement on climate significantly in recent years—reflecting in part demands by the membership—with a focus on policy papers and flagship reports, accompanied by some discussion of climate change-related policy challenges in bilateral country reports.

The paper argues that the time has come for a systematic and strategic integration of macro-critical aspects of climate change into the IMF's core activities. It proposes covering climate change-related policy challenges comprehensively in Article IV consultations, aiming at discussing such challenges with all members every 5-6 years, and more frequently with the largest emitters of greenhouse gases and countries particularly vulnerable to climate change. It also suggests expanding coverage of climate risk to all financial stability assessments (FSAPs), and a substantial scaling up of climate-related capacity development (CD) activity in line with member demand. In strengthening its engagement on climate, the IMF will continue to cooperate and partner closely with other institutions to leverage complementarities and provide the best service to its members. The paper also estimates the cost of implementing the strategy.

Executive Board Assessment¹

Executive Directors welcomed the opportunity to discuss a strategy to help Fund members address climate change related policy challenges. They concurred that climate change is a global existential threat that poses critical macroeconomic and financial policy challenges for the whole Fund membership in the coming years and decades. Against this backdrop, Directors broadly agreed that the Fund has an important role to play, within its mandate, in

¹ At the conclusion of the discussion, the Managing Director, as Chairman of the Board, summarizes the views of Executive Directors, and this summary is transmitted to the country's authorities. An explanation of any qualifiers used in summings up can be found here: <http://www.IMF.org/external/np/sec/misc/qualifiers.htm>.

supporting members' efforts to address climate change related challenges through its surveillance, when macro-critical, and through its capacity development (CD) activities.

Directors supported a more comprehensive coverage of climate change related policy challenges in Article IV consultations, where macro-critical. In line with the conclusions from the Comprehensive Surveillance Review, they generally agreed that coverage of climate change mitigation in Article IV consultations would be strongly encouraged for the largest emitters of greenhouse gases. Some Directors stressed that this means that coverage of these policies would be voluntary. Directors supported the proposal to regularly cover adaptation and resilience building policies for the most vulnerable countries to climate change, including options to attract climate financing. In addition, they generally saw a need to cover the management of transition risks, including for fossil fuel exporters, of adjusting to a low carbon economy, while taking into consideration each country's own circumstances.

Directors agreed that Financial Sector Assessment Programs should have a climate component where climate change may pose financial stability risks. This would help assess any potential pressure points for the financial system from physical climate shocks and from the transition to a low-carbon economy. A few Directors emphasized that this climate component should be aligned with the standards being developed by relevant international standard-setting bodies to ensure a consistent policy advice.

Directors supported expanding climate-related CD efforts, given rising demand by the membership. They also generally supported complementing Fund CD resources with donor funded activities. A number of Directors also noted that the Fund could consider using program conditionality to support borrowing countries to increase their resilience to climate change shocks and ensure macroeconomic sustainability, provided the conditionality is in line with the Fund's lending mandate and policies. A few Directors cautioned, however, against using climate-related conditionality.

Directors agreed that policy papers and multilateral surveillance reports should remain critical outlets for disseminating the Fund's analytical and policy work on climate change, especially for topics with a multilateral component that require policy coordination, such as mitigation policies or climate financing. Directors underscored that reliable climate data are a critical foundation for macro-climate analysis and encouraged further work in this area. They generally stressed the importance of developing models and standardized toolkits to support the Fund's work in both multilateral and bilateral surveillance, while being mindful of potential limitations in models and toolkits, including due to specific country circumstances.

Directors stressed the importance of partnering with other institutions, including the World Bank Group, on climate-related work. They called for a more systematic approach to collaboration to leverage the expertise of other institutions, while minimizing overlap and maximizing value for the membership.

Directors took note of the proposal for gradually adding 95 Full-Time Equivalents to implementing the proposed climate strategy. They looked forward to assessing this, together with other funding requests, during the discussion of the Fund's overall budget.

Directors generally agreed that some internal re-organization that facilitates an efficient delivery of the climate strategy would be needed, in particular by establishing climate hubs in functional departments and reinforcing area departments as necessary. A few Directors stressed that greening the Fund's own operations and reducing its carbon footprint will be key for the institution's credibility.



June 30, 2021

IMF STRATEGY TO HELP MEMBERS ADDRESS CLIMATE CHANGE RELATED POLICY CHALLENGES: PRIORITIES, MODES OF DELIVERY, AND BUDGET IMPLICATIONS

EXECUTIVE SUMMARY

Climate change has emerged as one of the most critical macroeconomic and financial policy challenges that the IMF's membership will face in the coming years and decades. By contributing to a higher frequency and intensity of natural disasters, climate change is already imposing large economic and social costs on many economies. In the period ahead, climate change is bound to affect macroeconomic and financial stability through numerous other transmission mechanisms, including fiscal positions, asset prices, trade flows, and real interest and exchange rates. While the mechanisms' relative importance will differ between individual countries, no country can expect to be spared entirely.

Many of the ensuing policy challenges fall firmly within the realm of the IMF's expertise, and for the Fund to live up to its mandate, it needs to assist its members in addressing these challenges. Moreover, climate change mitigation is a global public good and requires an unprecedented level of cross-country policy cooperation and coordination. As a multilateral institution with global reach, the IMF can assist with coordinating the macroeconomic and financial policy response.

Driven by demands of the membership, the IMF has stepped up its engagement on climate-related issues in recent years, and it has started building up expertise. The approach to date has placed heavy emphasis on flagship reports and policy papers, accompanied by some discussion of climate change-related policy challenges in bilateral country reports. The IMF has also experimented with new formats, such as the Climate Change Policy Assessments conducted on a pilot basis with the World Bank. The ad-hoc approach has reached its limits, however, and the time has come for a more systematic and strategic integration of climate change into the IMF's activities.

This paper proposes a comprehensive strategy for the IMF's engagement on macro-critical, climate-related policy issues. It starts from a stock-taking exercise that reviews the Fund's activities in this area thus far. The paper then presents a detailed concept of adequate engagement to serve the needs of the membership, including the delivery of specific outputs and collaboration with other institutions. The final section sketches budgetary and human resource management implications.

Approved By
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Prepared by the Strategy, Policy, and Review Department in close collaboration with almost all departments, in particular the Fiscal Affairs, Monetary and Capital Markets, and Research Departments as well as the Office of Budget and Planning. The staff team consisted of Saad Quayyum, Tito da Silva, Vimal Thakoor, and Irene Yackovlev, was led by Johannes Wiegand, and worked under the general guidance of Kristina Kostial (all SPR). Significant contributions were provided by Valerie Guillamo, Fouad Manal, Emanuele Massetti, Ian Parry, James Roaf (all FAD), Florence Jaumotte (RES), Prasad Ananthakrishnan, Ivo Krznar, Dulani Seneviratne (all MCM), Liam O’Sullivan (SPR), Keith Clark (CSF), and Iryna Ivaschenko (ORM). Comments are gratefully acknowledged from departments and from Axel Schimmelpfennig (OBP). Marisol Murillo and Elisavet Zachou (SPR) assisted with the production of the paper.

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Abbreviations and Acronyms

ADs	Area Departments
AFR	African Department
APD	Asia & Pacific Department
BCBS	Basel Committee on Banking Supervision
BIS/FSI	Bank for International Settlements/Financial Stability Institute
CARTAC	Caribbean Regional Technical Assistance Center
CAT	Catastrophe
CCPAs	Climate Change Policy Assessments
CCRT	Catastrophe Containment and Relief Trust
CD	Capacity Development
CGE	Computable General Equilibrium
CMAP	Climate Macroeconomic Assessment Program
COM	Communications Department
CSF	Corporate Services and Facilities Department
CSR	Comprehensive Surveillance Review
DRSs	Disaster Resilience Strategies
DSA	Debt Sustainability Analysis
DSGE	Dynamic Stochastic General Equilibrium
ESG	Environmental, Social, and Governance
EUR	European Department
Eurostat	European Statistical Office
FAD	Fiscal Affairs Department
FAO	Food and Agriculture Organization
FATF	Financial Action Task Force
FIN	Finance Department
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FTE	Full-Time Equivalent
GFSR	Global Financial Stability Report
GHGs	Greenhouse Gases
GIMF	Global Integrated Monetary and Fiscal Model
HQ	Headquarters
ICD	Institute for Capacity Development
ICPF	International Carbon Price Floor
IEA	International Energy Agency
IFIs	International Financial Institutions
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
ITD	Information Technology Department
LEG	Legal Department
LIC DSF	The Debt Sustainability Framework for Low-Income Countries
LICs	Low-Income Countries

MAC SRDSF	Sovereign Risk and Debt Sustainability Framework for Market Access Countries
MCD	Middle East and Central Asia Department
MCM	Monetary and Capital Markets Department
NDC	Nationally Determined Contribution
NGOs	Nongovernmental Organizations
NGFS	Network for Greening the Financial System
NOAA	National Oceanic and Atmospheric Administration
OECD	Organisation for Economic Co-operation and Development
PFM	Public Financial Management
PFTAC	Pacific Financial Technical Assistance Centre
PIMA	Public Investment Management Assessment
RES	Research Department
SDRs	Special Drawing Rights
SPR	Strategy, Policy, & Review Department
STA	Statistics Department
UN	United Nations
WEMD	World Economic and Market Developments
WEO	World Economic Outlook
WHD	Western Hemisphere Department
WTO	World Trade Organization

INTRODUCTION AND OVERVIEW

1. **Climate change has emerged as one the most critical macroeconomic policy challenges that the IMF’s membership will face in the coming years and decades.**

By contributing to a higher frequency and intensity of natural disasters, climate change is already causing momentous challenges for climate-vulnerable countries. In the period ahead, climate change will impact macroeconomic and financial stability through a variety of other transmission mechanisms. For example, global warming is likely to affect productivity and GDP, with repercussions for fiscal positions and public debt trajectories. It is also bound to impact asset valuations and therefore affect the balance sheets of financial and non-financial firms, which could undermine financial stability. Climate change will re-distribute income and wealth across the globe, and hence affect trade flows, exchange rates, and possibly even exchange rate regimes.

2. **The policy impact of addressing climate change creates another set of challenges.**

Adaptation and resilience building to climate change, for example, often require substantial investments, which can complicate fiscal management and impair debt sustainability. Preventing climate change—i.e., climate change mitigation—typically requires significant changes to tax regimes and regulatory frameworks, complemented by structural and spending policies to support a just transition. Further, climate change mitigation is a global public good, hence an effective mitigation strategy needs a global design and requires an unprecedented level of cross-country policy cooperation and coordination. A transition of the world economy to a low-carbon mode of production will, in turn, have repercussions for economies that depend on exporting fossil fuels.

3. **For the IMF to live up to its mandate, it needs to assist its members in managing these challenges.**

However, at this juncture the Fund is inadequately equipped to do so. While the IMF has been involved in the climate change debate since at least 2008—when a chapter in the World Economic Outlook identified climate change as “a potentially catastrophic global externality and one of the world’s greatest collective action problems” (IMF, 2008)—engagement to date has been mostly ad-hoc and unstructured, with a heavy focus on flagship contributions and policy papers. In the past few years, demands from the membership for climate-related work have increased significantly, particularly as regards the IMF’s surveillance and capacity development (CD) activities. The institution has responded by re-dedicating resources—often on a provisional, temporary basis—and increasing demands on existing staff. This approach has reached its limits however—it cannot deliver the comprehensive engagement on climate needed to meet the needs of the membership.¹

4. **Equipping the IMF to deliver on climate has organizational, budgetary, and human resource management implications.**

The IMF needs to reinforce its workforce with additional staff

¹For surveillance, a path forward was recently charted in the Comprehensive Surveillance (CSR) review (IMF 2021a). For Article IV consultations, the CSR established an expectation to regularly cover the mitigation policies of the 20 largest greenhouse gas emitters, and to cover adaptation policies and transition management to a low-carbon economy whenever the corresponding policy challenges are macro-critical.

to work on the nexus between macroeconomics and climate issues, and it needs to train its existing economists to increase their capacity for conducting climate-macro analysis. Specialized hubs with climate expertise are needed to assist country teams with the coverage of climate-related issues. Guidance needs to outline how to deal with climate-related challenges in surveillance and in other activities, while review capacity needs to be built up to ensure that the guidance is applied consistently and even-handedly to the membership. Partnerships with external stakeholders hold potential to deliver better services to members by complementing and strengthening the IMF's own analysis and expertise. The capacity to deliver CD should increase in line with the growing demand from the IMF's members.

5. This paper proposes a strategy how to scale up the IMF's capacity to deal with climate-related macroeconomic and financial policy challenges, in order to enable the Fund to assist its membership effectively. Section II sketches some macroeconomic policy challenges triggered by climate change. Section III summarizes the IMF's engagement on climate change to date. Section IV elaborates on what adequate coverage of climate change would entail. Section V sketches organizational, budgetary and human resource management implications and provides a risk assessment. Section VI concludes.

CLIMATE CHANGE: A CRITICAL MACRO-ECONOMIC POLICY CHALLENGE

Climate change causes momentous macroeconomic and financial policy challenges: it can destroy wealth, redistribute income between regions and countries, redirect trade, and impact asset valuations—all phenomena with major repercussions for fiscal, financial, and monetary policy management. Mitigating and adapting to climate change triggers policy challenges on its own. Most of these challenges and policy issues are firmly within the IMF's mandate.

6. Climate change presents a unique and unprecedented global policy challenge.

According to the International Panel for Climate Change (IPCC), absent decisive mitigation action, the global average temperature will exceed the pre-industrial level by 3–5 degrees centigrade by end-century—thus surpassing temperatures at any time since the emergence of mankind. Warming at this scale would be bound to trigger seismic ecological, economic, and social shifts. At the same time, climate change is building up gradually, which renders it difficult to fully appreciate its significance and implications in real time.

7. In economic terms, climate change is a negative externality with global reach.

Individual households, firms and governments do not sufficiently internalize the impact of their actions on the world's climate. Addressing climate change therefore requires not only policy intervention, but also an unprecedented level of global policy coordination between countries with

different economic structures, different levels of development, and different vulnerabilities and exposures to climate change.²

8. “Tipping points” are a major source of uncertainty in assessing the damages from climate change. If critical environmental thresholds are crossed, this could lock in a new climatic state. An example is the thawing of the permafrost, which would release into the atmosphere large quantities of CO₂ and methane currently locked away under the ice, triggering a runaway greenhouse effect. Other tipping points include the melting of the Himalayan glacier, changes in monsoon patterns, the weakening or reversal of ocean currents, and the melting of the Antarctic and Greenland ice sheets. By harboring the potential for catastrophic outcomes in case of inaction, tipping points reinforce the rationale for mitigating climate change.

A. Economic Impact

9. Early indicators of the economic damage from climate change are losses associated with the higher frequency and magnitude of extreme weather events. Natural disasters can cause enormous human, social and economic cost and are likely to become even more pronounced as global warming intensifies.³ Such events include prolonged droughts, large wildfires, intense heatwaves, torrential rains, floods, hurricanes, or extreme cold periods.⁴ Global warming is also driving trends that are less visible and disruptive in the short term, but carry potentially large economic cost in the long term, such as rising sea levels, the destruction of habitable lands, the acidification of oceans, and more frequent outbreaks of vector-borne diseases such as Zika, dengue and malaria. Other economic transmission mechanisms include lower productivity in agriculture and fishing, increased climate-related pressures for forced migration, and risk of conflict.

10. There is broad agreement in the economic literature that the effects of rising temperatures on the level of GDP are non-linear. An increase in the average temperature raises GDP in countries where annual average temperatures are low, but reduces GDP where they are high, with the threshold estimated at an annual average temperature of about 13–15°C.⁵ Some estimates also suggest an additional impact of warming on *growth* (e.g., Burke et al., 2015), though this is open to debate. A transmission mechanism through growth would result in much larger long-term GDP losses: in the absence of mitigation policies, these could be to the order of 25 percent of GDP by 2100 for the world economy, relative to holding temperatures fixed at current levels.

²Stern (2007) identifies climate change as “the greatest market failure the world has ever seen.” In April 2021, in an open letter to world leaders, 101 Nobel laureates called for governments to sign up for a fossil fuel non-proliferation treaty; see <https://fossilfuelstreaty.org/nobel-letter>.

³Output losses from natural disasters can be very large. For example, when Hurricane Maria struck Dominica in 2017, losses were estimated to exceed 200 percent of GDP.

⁴Natural disasters can also cause spillovers to other countries. A 2011 flooding in Thailand, for example, halted the production of hard drives from one of the world’s largest producers, causing a worldwide shortage. Storms that hit Mozambique in 2019 affected electricity exports to neighboring countries.

⁵See Burke, Hsiang and Miguel (2015); Dell, Jones, and Olken (2014); Carleton and Hsiang (2016); and Heal and Park (2016) for literature reviews. A recent study is Kalkuhl and Wenz (2020).

11. Low-income countries (LICs) tend to be disproportionately affected by climate change, as many LICs are in regions that are already relatively hot. IMF estimates suggest that a temperature increase of 1°C in LICs lowers GDP in the same year by 1.2 percentage points (IMF, 2017). LICs' vulnerability is reinforced by the fact that they often have less resources to invest in adaptation and resilience building. They also tend to depend more on climate-vulnerable sectors such as agriculture, and often suffer from structural weaknesses such as weaker infrastructure, a higher prevalence of informal housing, lack of public services, weaker social safety nets, and political fragility, often exacerbated by weak institutions.⁶ Some estimates place output losses with unmitigated climate change at 60–80 percent by 2100 for countries located in hot regions.⁷ Given the strong interconnectedness of the global economy, no country is likely to remain unscathed even if the worst impacts are initially concentrated in hotter regions.

B. Macroeconomic and Financial Policy Challenges

12. Climate change is bound to trigger major challenges for macroeconomic and financial policy management. These challenges are likely to materialize through a variety of channels whose relative importance will differ between countries, reflecting factors such as vulnerability to warming and extreme weather events, economic structures, or the degree of economic and institutional development. Examples include:

- **Fiscal management and public debt sustainability.** Economic losses from climate change are likely to translate into revenue losses and spending pressures. This will trigger difficult fiscal policy challenges especially in countries that struggle with constrained fiscal space already.
- **Financial stability.** Assets and liabilities of financial firms could face large revaluations in response to physical risks arising from damages to property, infrastructure, and land, and transition risks that arise in the process of adjusting to a lower-carbon economy (Carney, 2015, IMF, 2020b). Financial firms are also exposed to physical risks through their underwriting activity, lending, and portfolio holdings. Liquidity risk can materialize in the form of asset fire sales.
- **Monetary policy.** As physical risk intensifies, monetary policy can face challenges from greater volatility in output and prices. Climate change and the policy response to climate change could also lead to persistent shifts in relative prices (for example, raising the price for fossil fuels), while the long-term effects of climate change-related policies may affect real interest rates. Monetary policy needs to internalize and manage these factors (McKibbin and others., 2017).
- **Trade, exchange rates and exchange rate regimes.** By changing relative prices and redistributing incomes across the globe, climate change is bound to affect trade flows, with repercussions for exchange rates. Higher volatility can also complicate adherence to managed exchange rate regimes, especially when combined with other vulnerabilities (such as high dollarization or debt levels).

⁶IMF (2017) and IMF (2020a).

⁷Burke et al. (2015).

13. The *policy response to climate change can give rise to another set of macroeconomic and financial policy challenges*. Examples include:

- **Adaptation and resilience building can be fiscally costly.** IMF (2021b), for example, estimates that for the Asia and Pacific region, annual average investment needs can exceed 3 percent of GDP—with costs typically falling due upfront, while benefits only accrue in the medium to long term. Further, needs for resilience building are often the most pressing in countries that already have elevated public debt levels and limited revenue generating capacity (IMF 2019a). In this case, domestic fiscal efforts may need to be complemented by support from the international community to close financing gaps.⁸
- **Climate change mitigation and the transition to a low-carbon economy** typically require significant changes to tax, spending, and regulatory systems. Accompanying social and structural policies are needed to ensure a just transition, repurpose human and physical capital, and build the infrastructure for a low-carbon economy (IMF 2019b, 2020c), including incentives for low-carbon R&D and targeted support for households and workers. The nature of transition management needed will often differ greatly between countries, given differences in economic structures and institutional arrangements. In particular, as mitigation typically involves higher energy prices, it can require adjustments to development and industrial policy strategies.
- Given the public good character of climate change mitigation, **enhancing the effectiveness of mitigation efforts hinges on international policy coordination.** Coordination could prevent potentially destabilizing spillovers from inadequate mitigation policies to other countries. It would also help reduce concerns about carbon leakage and competitiveness losses that could materialize if countries pursue mitigation unilaterally. Policy coordination is also needed to ensure that LICs and other climate-vulnerable countries have sufficient financial and technological means to pursue adaptation and mitigation policies.
- **A global transition to a low-carbon economy** creates existential challenges for many countries that depend on fossil fuel exports. A combination of financial diversification (investing export surpluses in low-carbon assets) and real diversification (developing non-fossil fuel sectors of the economy) will typically be needed to manage these challenges, with implications for fiscal, structural and, potentially, exchange rate policies.

IMF ENGAGEMENT ON CLIMATE CHANGE ISSUES TO DATE

The IMF has been involved in the climate policy debate for many years, with an emphasis on policy papers and flagship reports in the beginning that was followed by a gradual shift to bilateral country engagement (Article IVs, FSAPs, CD). In recent years, climate-related demands on IMF staff have increased greatly, especially in surveillance. To support these demands, the IMF has begun developing policies at the intersection of macroeconomics and climate, cooperating with a wide range of

⁸See, for example the [2018 ECCU Article IV](#).

institutions in the process. Until now the IMF has met the additional demands by reallocating resources within a mostly unchanged budgetary envelope and organizational structure, with an extraordinary effort made in the past nine months in anticipation of COP26—an approach that has reached its limits.

A. Direct Country Engagement

14. Climate change has been discussed in the context of Article IV consultation and Financial Sector Assessment Program (FSAP) reports.

- **Article IV Consultations.** During 2015–17, 27 climate and energy Article IV pilots discussed topics such as energy subsidy reform, mitigation policies and resilience building, covering a wide spectrum of countries. Since then, Article IV consultation reports have covered climate change on an ad-hoc basis, reflecting requests from country authorities and staff capacity.
 - For *climate-vulnerable states*, six Article IV consultations (about 2 per year) have been able to draw on pilot Climate Change Policy Assessments (CCPAs) conducted jointly with the World Bank.⁹ The CCPAs contained in-depth assessments of financing and investment needs and provided a road map for formulating disaster resilience strategies (DRSs) for climate change adaptation. For Dominica and Grenada, the country authorities—in collaboration with the country teams as well as other IFIs—prepared a DRS on their own that was discussed in the Article IV report.¹⁰ A recent example of adaptation coverage without a CCPA or DRS is the Maldives’ consultation, which included model-based analysis for prioritizing resilience-building needs. At present, capacity suffices to cover adaptation issues in about 4–6 Article IV consultations per year.
 - In cases where *mitigation policies and transition management* have been covered in-depth, the discussion in the Article IV report has often been complemented by selected issues or working papers (see Box 1 for examples). At present, staff capacity suffices to cover mitigation and transition management in-depth in 4–6 Article IV consultations per year.
- **Financial Sector Assessment Programs (FSAPs).** Physical and/or transition risks assessment have been covered on average in two FSAPs per year. Current capacity does not allow climate risk analysis in all FSAPs, including stress testing and assessments on financial oversight.

15. Climate-related topics are a rapidly increasing area of demand for CD. To date, most CD has focused on fiscal issues. Where possible and called for on substance, CD is being delivered in collaboration with institutions like the World Bank, OECD, and the IEA to leverage these institutions’ expertise. The IMF has also started engaging in partnerships with bilateral donors.¹¹

⁹For Belize, Grenada, Micronesia, Seychelles, St. Lucia, and Tonga.

¹⁰The Board was briefed on these in May. The DRS followed IMF (2019a), a paper that concluded that there was a need for a coherent medium-term approach to help countries prioritize and prepare for natural disasters.

¹¹For instance, Germany is providing funds for greening the recovery and CD that helps countries design and implement their climate mitigation and adaptation strategies, while the United Kingdom has provided funds to

(continued)

- On **fiscal issues**—other than the CCPAs mentioned above—CD has covered mitigation and adaptation policies as well as building resilience. CD has assisted with developing carbon pricing schemes and related tax policies. There is also initial work to develop CD for public financial management on issues such as green budgeting and the development of a climate-related module in public investment management assessments (PIMA).¹²
- In the area of **financial sector policies**, CD is very limited at this point, covering climate-related stress testing for the insurance sector, regulation and supervision of climate-related risks, climate-related debt management, and green bonds.
- Some **modelling support** has covered the domestic macroeconomic, external, and distributional implications of climate-related policies.
- To support **training** in member countries, a climate module is part of the newly launched Inclusive Growth online course, and work is ongoing to develop a model-based framework on mitigation and adaptation. Moreover, there are plans for interactive microlearning videos.

B. Multilateral Surveillance, Analytics, and Policy

16. Climate change related issues have featured in numerous *flagships and policy papers* since 2008, when the first *World Economic Outlook's* (WEO) climate chapter was published.¹³ The work on flagships and policy papers has often involved modeling support and instigated the development of toolkits.

- **Flagships.** Staff has published many impactful analyses on climate-related topics in flagships (WEO, GFSR, Fiscal Monitor) and Regional Economic Outlook papers. These contributions have focused on a wide variety of issues, including (i) developing a conceptual and quantitative framework for carbon pricing;¹⁴ (ii) making a case for stress testing to climate risks and promoting climate-related disclosures;¹⁵ (iii) highlighting the economic impact of climate change

CARTAC to help member countries with CD to build climate change and disaster resilience, and Switzerland is financing the IMF Climate Innovation Challenge, launched in June 2021.

¹²Climate PIMAs focus on (i) climate-aware planning—whether public investment is planned considering climate change policies, (ii) coordination between entities—how decision making on climate-related investment is coordinated across the public sector, (iii) project appraisal and selection—in particular the reflection of climate-related analysis and criteria, (iv) budgeting and portfolio management—how the government's portfolio of climate-related public investment projects is managed, and (v) risk management—how the government identifies and manages its fiscal risk exposure associated with public investment that could be impacted by climate change and natural disasters.

¹³The April 2008 WEO (IMF, 2008) analyzed a variety of mitigation policies, with a recommendation for global and equitable carbon pricing.

¹⁴The October 2019 Fiscal Monitor (IMF, 2019b) provided a quantitative framework for understanding the impacts and trade-offs of carbon taxes and similar pricing schemes to implement climate mitigation strategies, particularly in the largest advanced and emerging economies.

¹⁵The October 2019 GFSR (IMF, 2019c) covered developments in ESG markets (issuance, pricing, policy issues like disclosures); the April 2020 GFSR (IMF, 2020b) looked at whether climate physical risks were properly priced in global equity markets; the October 2020 GFSR offered an initial assessment of the impact of the COVID crisis on firms'

(continued)

and its policy implications on LICs, and on sub-Saharan Africa in particular;¹⁶ and (iv) devising a strategy of how to deliver global emissions reductions while minimizing economic and social cost during the transition.¹⁷

- **Policy papers** have also discussed a wide variety of climate-related topics and policies, such as energy subsidy reform, mitigation policies, resilience building to natural disasters, state-contingent debt instruments for climate vulnerable countries, or macroeconomic and distributional trade-offs of different mitigation policies in the European Union and in Asian economies.¹⁸

17. Various strands of work aim to improve climate data for macroeconomic and financial analysis. The IMF launched in April an experimental climate change indicators dashboard.¹⁹ With climate data for macroeconomic analysis being a relatively new statistical area, much work has gone into establishing and improving methodologies.²⁰ Staff is also analyzing the main commercial data and analytics solutions currently available in the market.

C. Organization of Climate Work

18. To date, climate work is conducted mostly within pre-existing structures. Formal organizational changes have been very limited and have included (i) the creation of a Climate Advisory Group (2019) that consists of managerial staff from all departments and meets at least bi-monthly to disseminate information and coordinate climate work, (ii) the designation of a Deputy Director in SPR as the Fund-wide climate change coordinator (2020), and (iii) the creation of a climate policy group in FAD (also 2020). Further, several departments have set up networks to collaborate on climate issues, and there is also a Fund-wide, informal network of economists who are interested in climate issues. Other than this, many existing divisions and units have taken on climate work in addition to their other mandates and portfolios, such as the Multilateral Surveillance Division in RES, the Strategy and Planning Unit in MCM, the Development Issues Strategy Unit in SPR, the Fiscal Operations 2 and Public Financial Management 2 Divisions in FAD, the Public Affairs Division in COM, and the Digital Advisory Unit in ITD. All departments partner extensively with external organizations on climate work (see the next section).

environmental performance (IMF, 2020f). The April 2020 GFSR made the case for stress testing and better disclosures to improve assessments of physical risks associated with climate change.

¹⁶IMF (2020g).

¹⁷The October 2020 WEO mapped out how a green investment push coupled with steadily rising carbon prices would allow countries to achieve necessary emissions reductions while containing transition costs.

¹⁸Examples include IMF (2019a, 2020e).

¹⁹The dashboard aims to become a comprehensive aggregator for statistical indicators on climate change, greenhouse gas emissions from economic activity, trade in environmental goods, green finance, government policies, and physical and transition risks. See <https://climatedata.imf.org/>.

²⁰For instance, staff organized an iLab event on climate data & disclosures during the April 2021 Spring meetings.

STEPPING UP ENGAGEMENT ON CLIMATE IN LINE WITH THE IMF'S MANDATE

Serving the needs of the membership requires stepping up climate work in many areas, including an expansion of coverage in Article IV Consultations and Financial Sector Assessment reports, and a significant increase in climate-related CD. To be able to deliver these outputs, country teams would need to be supported with expertise at the conjunction of macroeconomics and climate science, analytical tools, data, and guidance. The strategy below describes a steady state that is envisaged to be reached within 3 years.

19. The overarching objective of the IMF's engagement on climate is to provide high-quality, granular, and tailored advice to the membership on macroeconomic and financial policy challenges related to climate change. This would include *domestic policy challenges*, which would be addressed mostly in the context of the IMF's bilateral country engagements (surveillance, CD and lending), but also *global policy challenges*—reflecting the global public good character of climate change mitigation and the ensuing need to coordinate policies. As climate change affects countries, regions and sectors differently, and as countries' policy implementation capacity also differs, IMF analysis needs to be sufficiently granular and differentiated to factor in this heterogeneity and reflect it adequately in the IMF's policy advice. Substantial training within the IMF will be needed to live up to this challenge.

A. Direct Country Engagement

20. Article IV consultation reports should cover climate related policies wherever climate change triggers macro-critical policy challenges.²¹ As detailed below and summarized in Table 1, staff proposes coverage of climate-related issues in about 60 Article IV consultations per year. Overall, this would allow covering adaptation and resilience building every 3 years for those countries that are most vulnerable to climate change. The climate change mitigation policies of those countries most critical for the global mitigation effort could also be covered every 3 years, while transition risk management could be covered every 5–6 years for all members.

- **Climate Change Adaptation/Resilience Building.** Adaptation and resilience building are potentially relevant for a large portion of the IMF's membership. IMF (2019a) identified 60 countries—many of them LICs—as particularly vulnerable to climate change, ranging from exposure to hurricanes and floods to slower-moving phenomena such as draughts. Over time, the list of climate-vulnerable countries is likely to increase. Adaptation to climate change requires strategies to build both physical resilience—i.e., climate resilient infrastructure—and financial resilience—safeguarding the financial capacity to deal with disasters and to build resilience—with the latter firmly in the realm of the IMF's mandate. It can also include challenges

²¹See IMF (2021a) for a discussion about the relationship of the IMF's surveillance mandate—as codified in the Articles of Agreement and the 2012 Integrated Surveillance Decision—and the treatment of climate-change related policy challenges in Article IV consultations.

to financial and monetary policies, for example dealing with a higher frequency and amplitude of supply-side shocks and with changes in relative prices triggered by climate change.

In-depth coverage in Article IVs requires *inter alia* an assessment of country-specific climate vulnerabilities, adaptation policies, and financing needs to build resilience. A full, granular assessment of these issues will often require analysis conducted outside of the Article IV consultation cycle. The planned Climate Macroeconomic Assessment Program (CMAP) is meant to provide such analysis and input (see below). For Article IVs that cannot be preceded by a CMAP, standardized assessments will be needed that would also draw on work by partners.

Overall, a reasonable objective is to cover adaptation and resilience building in all climate-vulnerable countries every 3 years, with about half accompanied by a CMAP.

- **Climate Change Mitigation.** The Comprehensive Surveillance Review (CSR) published in May set forth the expectation that mitigation policies of the 20 largest emitters of greenhouse gases (GHGs) would be covered every 3 years or so.²² The approach inscribed in the CSR reflects the global public goods character of mitigation: while unconstrained global warming poses large risks to global macroeconomic and financial stability, no country can mitigate climate change on its own. Rather, success requires a collective effort to which countries can make an adequate contribution—with the largest impact triggered by mitigation policies of large GHG emitters.

As discussed in IMF (2021a), an Article IV consultation report would be open to different policy approaches to reach mitigation objectives. Further, they would refrain from assessing mitigation objectives *per se*, but would provide relevant context, including a comparison of domestic mitigation objectives with those of peers.

Living up to the commitment of the CSR will require 6–7 Article IV consultations with in-depth mitigation coverage per year (Box 1).

- **Transition Management** to a low-carbon economy. Transition management is a macro-critical policy challenge for almost every IMF member. It includes domestic policy efforts to achieve a country's Nationally Determined Contribution (NDC) under the Paris agreement, as meeting the NDC often requires changes to tax regimes, regulatory frameworks, and accompanying social and investment policies.^{23, 24} It also includes challenges arising from the *global* transition to a low-carbon economy, such as managing the transition for fossil fuel exporting countries.

33–34 assessments per year with 8–9 going in depth—in particular for carbon exporters—plus another 25 assessments with a more standardized methodology would allow covering transition risks for most of the IMF's membership over a time horizon of 5–6 years.

²²Together, these countries account for more than 80 percent of all GHG emissions.

²³All IMF members but one have committed to an NDC under the Paris agreement, and for most countries significant policy efforts are needed to achieve their NDCs.

²⁴Transition risk management to achieve an NDC is closely related to and overlaps with mitigation. The difference is that transition risk management is a domestic policy challenge that falls under the bilateral surveillance mandate of the IMF. Mitigation adds another dimension: with mitigation being a global public good, mitigation policy needs to be discussed within the global context and falls under the IMF's multilateral (rather than bilateral) surveillance mandate. See IMF (2021a) for a detailed discussion of this distinction and the implications.

Box 1. In-Depth Analysis of Mitigation and Associated Transition Risks

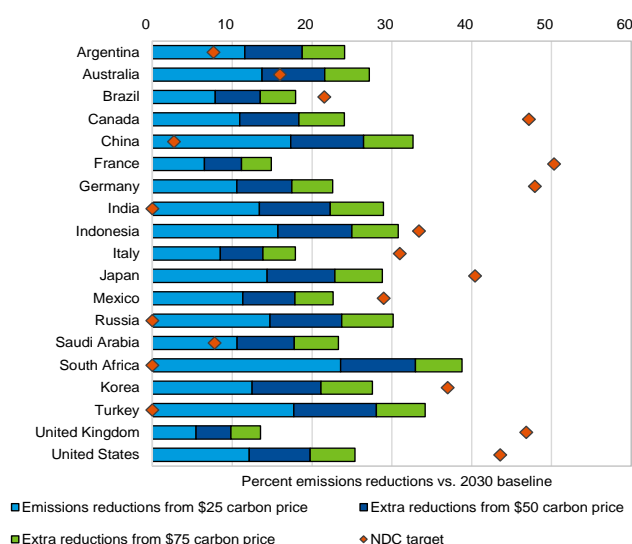
A thorough analysis of mitigation policy would start with a discussion of historical and anticipated future emissions trends, emissions sources, emissions and clean technology commitments in the context of the Paris Agreement and in national plans, and existing and envisioned mitigation policies at the national and sectoral level. It would also discuss the implications of the country's NDCs and, where existent, net zero commitments for mitigation, including an analysis of interim targets and a comparison with peers.

The analysis would present options for mitigation policies, along with quantitative assessments of the emissions, fiscal, economic efficiency and macroeconomic (GDP, employment, trade) impact. It would also discuss strategies for enhancing the acceptability of mitigation, particularly in countries where political economy considerations render carbon pricing difficult. Where feasible, incidence analyses for household income groups and vulnerable industries would be included.

The assessments would include quantitative analyses of the emissions, fiscal, and economic welfare impacts of carbon pricing, including the prices implicit in countries' mitigation pledges (see Figure) and domestic economic co-benefits (like the reduction of deaths from air pollution). They would illustrate the trade-offs (in terms of emissions, costs, and revenue) between pricing instruments and other policies like taxes on electricity, taxes on individual fossil fuels, energy efficiency policies and other regulations, and sectoral emissions pricing. The assessments would also provide practical guidance on how feebates or similar fiscal instruments can be used to strengthen mitigation incentives in various sectors (such as power, industry, transport, building, extractive, forestry, agriculture) while avoiding new tax burdens on the average household or firm. Where data permit, assessments of the incidence of carbon pricing across household income groups and vulnerable industries would also be provided.

Several recent Article IV consultations have included assessments of climate mitigation and transition risk policies in selected issues or working papers, including Canada, Denmark, Finland, Germany, Indonesia, Korea, the Netherlands, the U.K., and the U.S. These assessments typically recommended a comprehensive strategy with carbon pricing as the centerpiece, reinforced with feebates and public investment in clean technology networks along with productive use of carbon pricing revenues and just transition measures to protect vulnerable groups.

CO₂ Reductions for 2030 Pledges/ From Pricing



Source: IMF staff calculations.

Note: NDCs targets are from first-round or (if applicable) second-round Paris pledge. Estimates assume that CO₂ must fall in proportion to other GHGs to achieve the target (i.e. non-CO₂ GHGs must also fall in order for the target to be achieved). Where a country has a conditional NDC the target is defined as the average between the conditional and unconditional target. NDCs as of 2 June 2021.

Table 1. Article IV Consultations: Targeted Outputs

Type of Climate-Related Policy Challenge and Objectives	Coverage
Adaptation and Resilience Building.	
Objective: cover 60 climate vulnerable countries every 3 years	
Based on a CMAP	10 per year
Without a CMAP	10 per year
Climate Change Mitigation	
Objective: cover the 20 largest emitters of GHGs every 3 years	
In-depth coverage	6–7 per year
Transition Management to a Low-Carbon Economy	
Objective: cover all countries every 5–6 years	
In-depth coverage	8–9 per year
More standardized coverage	25 per year

Source: Authors.

21. Exposure to climate risk and policy options to manage such risk should become an integral part of all analyses under the FSAP (Table 2). This would help understand better potential pressure points for the financial system from physical climate shocks and from the transition to a low-carbon economy. It would also help inform policies needed to enhance risk management and the resilience of the financial system.

- **Topics.** A typical climate component of an FSAP would include stress testing to both physical and transition risks—with the test design depending on countries’ specific vulnerabilities and characteristics—as well as assessments of climate-relevant financial regulation and supervision. To this end, staff plans to develop and implement a standardized approach to assessing financial stability risks from climate change and the concomitant need for adaptation in the financial sector, in addition to sector-specific guides (bank and insurance) for inclusion of climate risk in the assessment of supervision and regulation (see Box 2).
- **Assessment process.** Staff envisages a three-stage template. First is a climate financial risk diagnostic to decide on the scope of the assessment and relevant climate physical and transition risks. The second is designing climate scenarios.²⁵ The third step would focus on risks that could

Table 2. FSAPs: Targeted Outputs

Deliverables	Coverage
Assess climate issues as part of FSAP risk analysis and assessment of financial oversight frameworks. ¹	All FSAPs, based on an assessment of the materiality of climate risk

Source: Authors.

1/As agreed with county authorities and depending on the systemic importance of climate risk in the jurisdiction.

²⁵While staff will leverage on NGFS scenarios for transition risks where countries are covered by the NGFS, many emerging market economies and LICs are not covered. Moreover, the physical risk coverage in NGFS scenarios is limited to one climate hazard and thus lacks the comprehensiveness needed for FSAP climate stress testing.

materialize over the three- to five-year FSAP horizon—in contrast with the longer-term focus adopted by most central banks and regulators—and apply scrutiny to physical risks.

22. Climate-specific review is needed to safeguard quality and evenhanded treatment across topics and countries. The case for review is especially strong for the coverage of mitigation policies for the 20 largest emitters of greenhouse gases in Article IV consultations, given that (as per CSR) regular coverage is strongly encouraged. Review would also be conducted for other in-depth discussions of climate policies in Article IV reports, selected FSAPs, CMAPs, selected issues papers, working papers, and for policy papers (see below).

Box 2. Climate Risk Analysis in FSAPs

FSAPs have been assessing the impact of climate-related natural disaster events on financial stability for some time. A textual analysis of 192 FSAP reports (up to 2019) found that 33 FSAPs (17 percent) contained meaningful references to risk factors such as droughts, floods, and storms. Many of these FSAPs were for small island states (such as the Bahamas, Jamaica, and Samoa). Some assessments for advanced economies (such as Belgium, Denmark, France, Sweden, and the U.S.) have also covered natural catastrophe risks as part of insurance stress testing.

More recent FSAPs have developed new approaches to assessing climate change risk.

- Norway 2019 FSAP. Three possible transmission channels for transition risk to the financial system were explored: (i) the impact of a substantial increase in domestic carbon pricing on banks' health via its effect on corporates' operating costs and profitability, (ii) the impact of a large increase in global carbon prices on the domestic economy and banks' loan losses via the fall in the revenues of domestic oil producers, (iii) the impact of a forced reduction in the production of domestic oil firms on their share prices and, in turn, on the net wealth of domestic shareholders. Results show that a sharp increase in carbon prices would have a significant but manageable impact on banks (IMF, 2020b and Grippa and Mann, 2020).
- Philippines 2021 FSAP. Climate stress test scenarios were constructed with three distinctive components. The frequency and intensity of typhoons were projected under a global climate scenario drawing on climate science inputs. A catastrophe (CAT) risk model used in the property insurance industry was deployed to estimate damages to infrastructures from typhoons. The resulting damage was applied as depreciation shock to the capital stock and simultaneous productivity shock based on existing literature of infrastructure economics in a dynamic stochastic general equilibrium (DSGE) model calibrated for the country. The exercise focused on typhoon risks. The results indicated a relatively moderate impact on bank capital even for an extreme typhoon on its own. Nonetheless, if multiple types of extreme shocks materialize at the same time—so-called compound risk such as an extreme typhoon during a pandemic—the damage could be substantially more amplified.

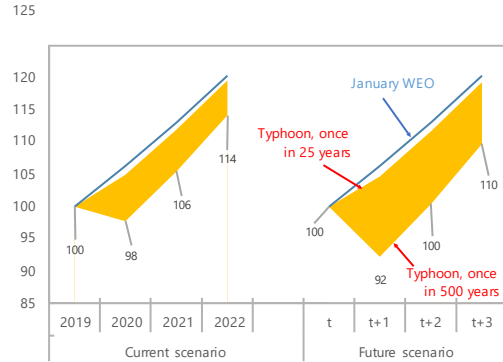
The oversight section of FSAPs also started to cover climate issues. In the 2020 U.S. FSAP, the regulatory response to the increasing incidence and severity of natural catastrophes was considered as part of the assessment of supervision and regulation of the insurance sector. In the 2019 Korea FSAP, the coordination of climate action across authorities as well as supervisory strategy and major initiatives among the financial industry were discussed in the Technical Note on Financial Conglomerates Supervision.

Box 2. Climate Risk Analysis in FSAPs (concluded)

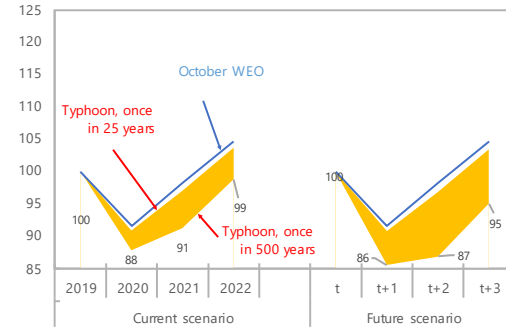
The Philippines: Climate Change Stress Test

Macroeconomic assumptions: a severe typhoon is assumed to hit the country in Q3 2020

Macroeconomic Impact of Typhoons-Normal Time
(2019 real GDP = 100)



Macroeconomic Impact of Typhoons and Pandemic
(2019 real GDP = 100)

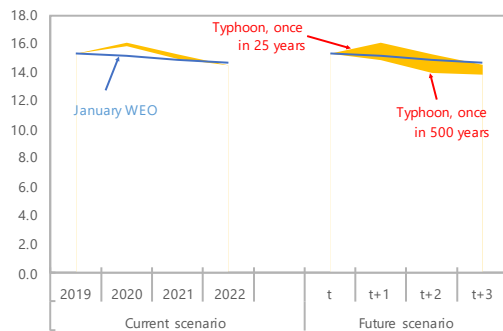


Impact on bank solvency¹

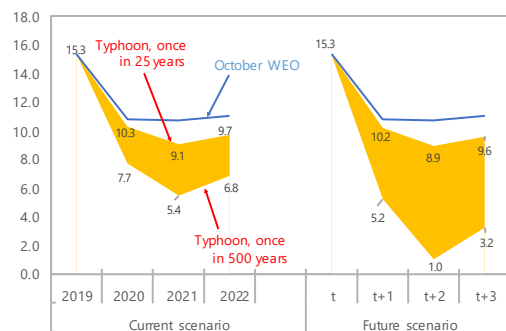
Climate change (the difference between current and future scenarios) has only a moderate impact on the effect of a severe typhoon to bank capital during normal time...

...but climate change increases the effects of a severe typhoon in an extreme tail event—a joint shock of a once in 500 years typhoon and pandemic.

Impact of Typhoons on Bank Capital-Normal Time
(Total Capital adequacy ratio in percent)



Impact of Typhoons and Pandemic on Bank Capital
(Total Capital adequacy ratio in percent)



Notes: Bank capital ratio of UKB banks.

See Appendix I for methodological details.

1/Bank capital rises in scenarios without pandemic over the short-period due to the valuation gains with securities (mostly sovereign) as the central bank cut policy rate.

IMF-Supported Programs

23. Within the Fund’s lending mandate, financing may be provided under IMF-supported programs when climate-related measures are deemed critical to solve a member’s balance-of-payments (BoP) problems. The IMF is already providing rapid assistance to country hit natural disasters through its Rapid Financing Instrument and Rapid Credit Facility.²⁶ Further, to preserve fiscal sustainability, the IMF has already incorporated climate-related elements—such as energy

²⁶Moreover, under the Catastrophe Containment and Relief Trust (CCRT), the Fund can also provide grants for debt relief for the poorest and most vulnerable countries hit by catastrophic natural disasters or public health disasters.

Box 3. Climate Considerations in IMF-Supported Programs

IMF-supported programs (“programs” thereafter) can have an important role in helping build climate-resilient economies, within the Fund’s lending mandate whereby the IMF provides financing to members in resolving BoP problems. Climate considerations have already been incorporated in program design in many countries. In the context of needed fiscal adjustments, a range of “green” measures have been deployed in several programs:

- Fuel and energy subsidy reforms have dual BoP-stabilization and climate mitigation effects. Reducing energy subsidies has been the focus, for instance, in programs for Egypt ([2016 EFF](#)); Tunisia ([2016 EFF](#)); Ukraine ([2015 EFF](#)).
- Where revenue mobilization is a priority, programs have helped the authorities introduce new taxes and otherwise improve their tax systems. This has included widening the range of revenue mobilization options such as carbon taxation (Jamaica).
- To support green recovery over the course of fiscal consolidation and to contain possible longer-term BoP needs, programs have also highlighted the development of coherent resilience-building strategies (Costa Rica).
- Members have included natural disaster clauses in new borrowing contracts, which can increase financial resilience to climate shocks (Barbados, Grenada) in the context of a sovereign debt restructuring.

Other aspects of program design could also internalize climate considerations, to the extent that they are consistent with the IMF’s lending mandate. Under program-supported PFM reforms, green budgeting could help include and track climate-related spending across budget cycle phases. Offsetting distributional implications of climate-related measures would be critical to building broad support for adjustment in general and a green recovery. In particular, programs would need to continue prioritizing measures to protect the poor by establishing targeted cash or near-cash transfers and expanding existing ones.

subsidy reform, carbon pricing, and financial resilience building—into some programs (Box 3). Such measures could be informed by the IMF’s analytical and policy work in the context of its surveillance activities. Consistent with and constrained by the IMF’s lending mandate, climate-related measures could be further internalized in program design when such measures are deemed critical for resolving BoP problems. The ongoing discussion on rechanneling allocated SDRs is also considering measures to finance climate-supportive measures as part of a range of options.

Capacity Development—Single-Country CD and Training

24. Climate-related CD has several components: (i) the CMAP—a diagnostic tool under development to analyze climate change policies and preparedness for climate-vulnerable countries, (ii) climate-related single-country CD, and (iii) external training. Table 3 summarizes the main outputs envisaged in these areas.²⁷

25. The CMAP would build on the CCPA, but with a stronger macroeconomic and financial focus. Among other things, CMAPs would analyze links between resilience building and long-term

²⁷As per the IMF’s Article of Agreements, CD needs to be consistent with the purposes of the IMF (Art. V.2(b)).

growth, climate financing needs, distributional effects of climate policy, and long-term decarbonization plans. As discussed above, appropriate coverage of climate-vulnerable countries would require at least 10 CMAPs per year (up from the current delivery of 2), with a view to informing the corresponding Article IV consultations.²⁸ Many countries have already signaled interest in a CMAP.

26. Demand for climate-related single-country CD is expected to increase significantly.²⁹ A substantial share of this CD is expected to go to LICs and small states, reflecting both the need to bolster capacity and the fact that these countries tend to be disproportionately affected by climate change.

- On **fiscal issues** there is already considerable CD (see the previous section). Various in-house mitigation analysis tools are under development for use in CD. Fund staff is providing member countries—such as Costa Rica, Colombia, Guatemala, Jamaica, Moldova, Seychelles—with fiscal and economic assessments of the impact of carbon taxes and/or is advising them on green tax reforms. The increase in CD would focus on green budgeting and climate PIMA; on the latter, about a dozen countries have already shown interest.
- On **financial sector issues**, CD would be substantially increased to assist with climate risk stress testing, financial sector regulation and supervision, monetary policy and central bank operations, and climate-related debt management issues. Financial Sector Stability Reviews would be a useful vehicle for delivering climate risk assessments to LICs and small states. Additional delivery modalities to complement bilateral CD work such as webinars would also be considered.
- In the area of **data**, the Climate Change Indicators Dashboard would need to be accompanied by CD to help bolster member countries' capacity to collect and report the new indicators. While no CD has been provided in this area as of now, it will be critical to train data compilers so that they can provide reliable and timely data for policy making. To deliver CD to LICs and small states, staff considers developing a toolkit for data collection, risk analysis and assessment.
- On **macro frameworks**, the objective is helping climate-vulnerable countries build macro scenarios that reflect climate change shocks as well as mitigation and adaptation policies, with a focus on growth, macroeconomic stability, and debt sustainability.
- On **legal and financial integrity issues**, single-country CD would cover legal aspects related to climate change policies in the areas of central banking, financial sector, Public Financial Management, tax law, governance, anti-corruption and financial integrity.

27. There also is a need to substantially increase external training. Many members are scaling up climate work, including by establishing climate units in ministries of climate and central banks. Given a dearth of expertise linking macro and climate science, the IMF can support these

²⁸Board engagement on a fully fleshed out concept for the CMAP is envisaged for early 2022.

²⁹Single-country CD would be mindful that digitizing government and financial services be done in a manner that does not excessively increase the carbon footprint (e.g., adopting green cloud data centers) and that improves transparency and efficiency in the domains of energy distribution or information sharing.

efforts by training more authorities in these areas through dedicated courses, interactive microlearning videos and webinars—as staff is already doing on a small scale for the Coalition of Ministers of Finance for Climate Action. All these training methods would bolster the authorities’ capacity to analyze the macroeconomic and financial effects of climate change, natural disaster shocks, and policies. Climate modules would also be incorporated into existing training courses, including on general macroeconomics, fiscal issues, and financial sector policies.

Table 3. Capacity Development: Main Targeted Outputs

	Coverage
Climate Macroeconomic Assessment Program Reports	10 per year
Single-Country CD	87 per year
<i>Fiscal issues</i>	10
<i>Financial sector issues</i>	30
<i>Climate data</i>	20
<i>Macro modeling</i>	15
<i>Legal and financial integrity issues</i>	12
External Training	
Online course on the macroeconomics of climate change	5–6 times per year
Micro-learning interactive videos	10

Source: Authors.

B. Multilateral Surveillance, Analytics, and Policy

28. Chapters in flagship reports and regional surveillance reports as well as policy papers will remain key outlets for disseminating the IMF’s analytical and policy work on climate.

While coverage has increased markedly in recent years, impactful vehicles to communicate the Fund’s policy messages will become even more important as the urgency of climate-related macroeconomic policy challenges increases. Table 4 summarizes staff’s proposed outputs in this area. Flagships and policy papers are especially important for topics with a multilateral component that require policy coordination, as for these topics, country-level documents allow only partial coverage. Examples include cross-country cooperation of mitigation efforts or climate financing,³⁰ i.e., financial measures to support the mitigation and adaptation efforts of developing and (other) climate-vulnerable countries—a principle enshrined into the Paris agreement.

- **Flagship chapters** help shape institutional positions and often inform the engagement with members in the context of Article IV consultations and FSAPs.³¹ **Regional surveillance reports**

³⁰In this context, an [IMF staff proposal for an international carbon price floor](#) was published in June.

³¹For instance, the October 2021 GFSR will look at climate transition risks and opportunities in the asset management industry. The October 2021 WEO will lay out a multipronged strategy comprising of a green investment push; carbon pricing; support for green R&D; and measures to ensure social fairness of the transition. It will also reflect on labor market aspects of the green transformation, attempting to assess the share of jobs most directly affected and the demographic characteristics of workers in those jobs.

and papers can provide policy responses to climate change across peers, reflect region-specific circumstances and characteristics at greater depth than flagship reports can typically do, and draw in country authorities and teams.

- **Policy papers** in the next years could cover topics such as adaptation, integration of climate risk into debt sustainability analyses, transition risks for fuel exporters, climate adaptation in disaster-prone countries, international coordination of mitigation policies, the political economy of climate mitigation, developing a methodology for assessing the financial regulation and supervision of climate risks, broadening and deepening assessments of physical and transition risks, or assessing the financial stability implications of climate risks. At the same time, other policy areas are bound to emerge that may require a systematic discussion—while these are difficult to predict, they could encompass the nexus between climate and development policies and objectives (as manifested in the UN Sustainable Development Goals), macro-critical aspects of biodiversity, financial integrity and climate change, measurement of natural capital, or the link between climate and digitalization.
- Policy papers are being complemented by **staff climate notes**, a new outlet designed especially for the IMF’s climate work.

Table 4. Flagship Reports and Policy Papers: Targeted Outputs

Type of Document	Coverage
Flagship Reports (WEO, GFSR, Fiscal Monitor)	1–2 chapters per year
Regional Economic Outlook Reports	1–2 chapters per year
Policy Papers	1–3 per year
Staff Climate Notes	3–7 per year

Source: Authors.

29. With climate economics a rapidly evolving field, there will be a constant need to develop and upgrade guidance on how to reflect climate-related themes in bilateral country documents. In some policy areas, IMF analysis is fairly well developed—for example climate change mitigation—while in others, components of the Fund’s approach are still under development—an example is adaptation and resilience building. In yet other areas, significantly more groundwork is needed before guidance could be issued; an example are transition risks for fossil fuel exporters. Guidance will also be needed to facilitate and ensure consistent treatment across financial sector oversight assessments in FSAPs.³² An immediate priority is the update to IMF Surveillance Guidance Note, including to reflect the climate-related conclusions of the CSR. Guidance can also be disseminated through other channels, such as topic-specific how-to notes.

³²For instance, staff is developing sector-specific guide for assessments of the Basel Core Principles and Insurance Core principles.

30. Developing models and standardized toolkits would support the IMF’s analytical work in both multilateral and bilateral surveillance. To employ such toolkits efficiently, functional department staff would support country team requests for modeling climate impacts and provide granular policy analysis.

- **Global macroeconomic models** with detailed energy production and use are key to analyze the macroeconomic, sectoral, and trade implications of climate-related policies. Several in-house models are under development, including (i) a full structural global macroeconomic model (similar in design to the Global Integrated Monetary and Fiscal Model—GIMF) with detailed energy production and use;³³ (ii) a dynamic real CGE model to examine the short-, medium- and long-run impacts of policies at a more granular level, including sectoral and international trade effects; (iii) an Integrated Assessment Model to look at the long-run interaction between climate and the economy, including the negative feedback of climate change on the real economy. These models will support analysis of mitigation and transition issues in bilateral surveillance, scenario analysis for FSAPs, CD, and analysis of multilateral policy issues such as the international coordination of mitigation policies.
- **Debt sustainability analyses** (DSAs) would integrate countries’ exposure to climate risk and policy options to manage such risks. The debt sustainability framework LICs (LIC DSF) already includes—for countries that are frequently exposed to natural disasters—a stress scenario that incorporates a large temporary impact on growth. In addition, guidance is provided on how to incorporate the average impact of such disasters in long-term baseline projections. The new debt sustainability framework for market access countries (MAC SRDSF), to be rolled out in early 2022, will include a similar stress scenario. In addition, a long-term module in the MAC SRDSF will account for the fiscal cost of climate change adaptation and mitigation policies. Future work will seek to model the benefits from resilience and adaptation policies in terms of growth performance to complement the climate change-related modules in both DSA frameworks.
- **Toolkits and templates** give country desks straightforward-to-use instruments for policy analysis. An example is the IMF spreadsheet tool that quantifies carbon pricing and other policies for Paris pledges and energy subsidies for 150 countries; it has been used in several Article IV consultation reports. Planned toolkits include: (i) supporting the analysis of the macroeconomic effects of natural disasters and adaptation policies; and (ii) the analysis of the macroeconomic, external sector, and distributional implications of climate-related policies, including the interaction of climate change and climate related policies with inequality. More work is also needed on the longer-term implications of mitigation policies, and the interaction between climate change and debt sustainability, debt management tools, and instruments.

31. Reliable climate data are a critical foundation for macro-climate analysis. The Climate Change Indicator Dashboard will need maintenance, updates, and improvements. This includes further work on refining data sources, methodologies to make the indicators more suitable for surveillance and policy making, more granularity, and wider country coverage. Climate data will also

³³This model will share features with the external model G-cubed (which has been used for previous analysis) in that it allows to do short-term macroeconomic analysis (e.g., it features short-term nominal and real rigidities, and fiscal and monetary policies), has international financial flows, and forward-looking agents.

feature in the IMF's work on data gaps in the context of the G20 and the regular IMF Statistical Fora such as the 9th forum in November this year dedicated to *Measuring Climate Change*. Moreover, staff is providing leadership on data issues through the NGFS workstream on Bridging the Data Gaps. Granular data covering various dimensions of climate-change-related issues (for example physical risk and transition risk) will also need to be purchased from third-party data providers.

C. Support Activities

32. Internal training would contribute to upgrading the skills of IMF economists to conduct macro-climate analysis. A near-term priority is to launch and teach a "climate 101" course that would be mandatory for all IMF economists and would cover the most fundamental analytical tools on the intersection of climate and macroeconomics/finance. More granular courses and training will be needed to keep up with the rapidly expanding field of climate economics. While modalities need to be worked out, options include topic-specific "climate bootcamps" that would provide in-depth training on specific tools and approaches. Training would also be offered by external academics and possibly other institutions, with a view to introducing Fund staff to new models, analytical frameworks, and alternative approaches to climate change policies. Beyond formal training, internal knowledge sharing and peer-learning would continue via platforms like the Green Shoots series.

33. Several other components would be part of a robust support structure, including:

- **Legal and financial integrity issues.** The scaling up of the IMF's climate work is expected to increase demand for legal advice related to institutional issues on incorporating climate change issues in IMF operations; institutional arrangements for cooperation with stakeholders; integrating governance and financial integrity measures to safeguard climate change policies and programs; initiatives to increase the Fund's environmental sustainability such as carbon credit purchases, green building programs and employee transit benefits; and the development and implementation of ESG investment policies.
- **External communication** and outreach to official and non-official stakeholders and creative solutions and language services for climate-related work.

D. Partnering

34. IMF staff already successfully collaborates on climate work with a wide range of other multilaterals institutions, standard setting bodies, and NGOs. This collaboration, which has been expanded substantially over the past year, serves a multitude of purposes including:

- **Contributing to policy debate on climate change issues.** The Fund engages regularly with the G7, G20, and G24. Among other things, the partnership between the Fund and the Italian G20 Presidency served as a catalyst for convening the Venice Conference on Climate in July. Another example is the COP26 November 2021 conference. Staff also co-hosts with the World Bank the Secretariat of the Coalition of Finance Ministers for Climate Action that brings together fiscal and economic policymakers from more than 60 countries who have endorsed the Helsinki

principles for climate action, and also supports the Coalition's various workstreams, in particular on carbon pricing and green budgeting.

By contributing to such fora, the IMF is disseminating information, assists with policy formulation, and supports policy coordination—the latter an especially important task for climate change mitigation.

Staff works particularly closely with the World Bank, including on the Bank's new Climate Change Development Report, and maintains dialogues with the European Commission and the OECD. It also exchanges views regularly with various UN agencies, the IEA, the WTO, and regional development banks.

- **Improving climate data.** The Climate Change Indicators Dashboard is an IMF-led international statistical initiative. The indicators have been developed in cooperation with international organizations and other agencies including the OECD, the World Bank, the UN, the European Commission, the European Statistical Office (Eurostat), the Food and Agriculture Organization (FAO), the International Energy Agency (IEA) and the National Oceanic and Atmospheric Administration (NOAA).
- **Contributing to efforts to strengthen the information architecture around climate risks.** Better data and disclosures are needed to assess climate risks, allow accurate market pricing, enable informed investment decisions, and facilitate the growth of climate finance. The IMF co-chairs the NGFS workstream on bridging data gaps that covers data, disclosures, and taxonomies.³⁴ Staff also participates in the NGFS Legal Task Force that aims to take stock, assess and raise awareness of climate-related litigation risk. Further, the IMF is an observer in the International Platform on Sustainable Finance. On climate disclosures and taxonomies, staff cooperates with standard setting bodies and fora such as the International Financial Reporting Standards (IFRS) Foundation and the Financial Stability Board (FSB). Staff is also contributing to the work of FATF on climate and environmental crimes.
- **Strengthening Financial Stability.** Staff contributes to the global effort to further incorporate climate risk in the prudential framework and financial stability analysis. Staff, for instance, collaborates with the FSB on financial stability risks arising from climate physical and transition risks as well as on prudential standards for climate risk. Moreover, staff participates in the NGFS workstreams on microprudential supervision, scaling up green finance that covers central bank operations, and in the NGFS workstream on designing scenarios for climate physical and transition risks. Additional collaboration includes standard setting bodies and other fora such as the Basel Committee on Banking Supervision (BCBS) and the Sustainable Insurance Forum. Additionally, staff is collaborating with the BIS/FSI to incorporate climate risk in the supervisory and regulatory online course. Collaborations with the World Bank also facilitate the IMF FSAP scenario design for climate physical risk stress testing.
- **Collaborating with international organizations on CD.** The Fund has collaborated with the UNDP on several peer-to-peer sharing events by organizing roundtables on green budgeting in

³⁴See the recent NGFS [Progress Report on Bridging Data Gaps \(ngfs.net\)](https://www.ngfs.net/progress-report-on-bridging-data-gaps).

Asia and in the Caribbean. There is close cross-organizational coordination and dialogue with the OECD, the World Bank, UNDP, and the European Commission in the development of new standards and tools on climate-related public financial management issue such as green budget tagging, medium-term expenditure frameworks, and public investment management.

35. The Fund is also using its convening power and has exchanges with broader groups of stakeholders:

- **Using the Fund’s convening power.** The Fund is already using the opportunity of the Spring/Annual Meetings to raise awareness on the macroeconomic and financial challenges of climate change. It has also partnered with others on seminal events. For instance, the Fund co-organized the BIS green swan conference with the Banque de France and the NGFS in June and co-hosted a high-level climate event with the People’s Bank of China in April—both events focused on facilitating important dialogues between major representatives on green finance.
- **Exchanging views with NGOs, academics and the private sector.** Recent deepening of collaboration with the World Resources Institute, the NDC Partnership, and other climate-related NGOs has led to fruitful exchanges on analytical approaches and data, seminars for Fund staff, and exploration of areas for future collaboration. Staff has also started to engage in a dialogue with broader group of NGOs. In parallel, there is a continuous exchange of views with academics and policy makers, for example in the context of the High-Level Advisory Group led by senior IMF and World Bank staff and Professor Nicolas Stern from the London School of Economics. Staff is also engaged with think tanks, including the Center for Global Development. Further, IMF management and senior staff periodically exchange views with executives with oversight for sustainability at major financial institutions on issues such as climate financing and ESG.

36. The landscape for collaboration on climate continues to evolve. In recent years, it has become increasingly clear that climate change interacts with many policy areas—including macroeconomic and financial stability, development, and even peace and security. As a result, many institutions with different mandates have stepped up their engagement on climate. There is scope for experimentation and peer learning as the macro/climate nexus is a relatively new field. But there is also a need to move fast to get traction for policy action in this decade.

37. In such an evolving environment, collaboration is paramount. As the Fund has emerged as a more prominent voice on climate change issues, requests for participation and partnerships have multiplied. Our collaboration needs to ensure that staff is aware of the activities and policy advice given by other institutions, especially in the context of bilateral engagement with country authorities. Where feasible, coordination of policy messages can also be helpful. Staff will therefore continue to identify areas of collaboration with IFIs and development partners and explore new partnerships, focusing on member needs and on providing the best macroeconomic and financial policy advice possible—while being mindful of our comparative advantage and the costs of collaboration. Specifically, staff would be guided by the following considerations:

- **Broad exchanges.** Where possible, staff will seek to avoid collaborating on a project-by-project basis. The aim is to ensure frequent exchanges to remain on top of each other's agendas and

minimize overlaps, while recognizing, cross-referencing, and disseminating the work of other stakeholders. This will also help delineate an effective division of work in the climate space and leverage synergies.

- **Complementarity.** In some areas, the expertise of Fund staff and that of other institutions are complementary: for example, on adaptation, multilateral development banks and some NGOs are better placed to assess the needs for physical resilience building, while the comparative advantage of IMF staff is with integrating resilience building needs into coherent macroeconomic and debt sustainability frameworks. Another example is the IEA which maps out paths for sectors at the center of the transition—energy and transportation—and has been collaborating with the IMF to assess the macroeconomic effects of these.
- **Cost-benefit analysis.** Collaboration by itself is resource intensive: it often requires aligning institutions with different objectives, different internal organizations, different work cycles, difference governance structures, and different communication strategies. Hence cooperation should not be undertaken for its own sake. Staff will seek to align collaboration closely with institutional objectives to maximize the value added of collaboration for its members, while remaining cost effective.
- **Flexibility.** Collaboration needs to be nimble to allow experimentation and openness on policy options in an evolving environment. The latter implies that in the majority of cases, informal cooperation is preferable to formal cooperation arrangements.

ORGANIZATIONAL AND RESOURCE IMPLICATIONS AND RISK ASSESSMENT

Implementing the strategy requires some internal reorganization—especially the establishment of ‘climate hubs’ in a few functional departments to support the work on country teams—and additional staff with climate expertise. Needs for the latter are estimated at about FTE 95 in the steady state, i.e., once the scaling up is completed. They would complement existing resources, which are estimated at about 60 FTE including some transitional resources. Additional CD activities needed to fully implement this strategy are expected to be funded by donor support. In the first years of implementation there would be above-average investments in developing policies and training, while steadily ramping up country work through surveillance and CD. As policies mature and training materials are adjusted, resources would be moved to further increasing country support.

A. Organizational Implications

38. Efficient delivery of climate work requires some reorganization. “Climate hubs” in four functional departments—FAD, MCM, RES, and SPR—would host a significant portion of the IMF’s climate expertise to support country teams in the conduct of Article IV consultations and FSAPs, lead

policy development, and provide CD.³⁵ Also Area Departments would need to scale up, given that they are at the interface of the IMF's engagement with the authorities. The IMF's climate coordinator (based in SPR) and the climate advisory group would continue to coordinate work across the IMF.

39. The “climate hubs” would be organized in different ways—extra divisions/units in some departments, a network of economists and experts working on climate issues in others.

- The **Fiscal Affairs Department (FAD)** would produce and/or coordinate climate outputs on adaptation, mitigation and transition issues, including leading the production of CMAPs. It would reinforce country teams for Article IV consultations with climate economists and experts. Further, FAD would coordinate with international bodies, notably the Finance Ministers' Coalition for Climate Action. It would also continue to lead climate PFM work, including through provision of CD.
- The **Monetary and Capital Markets Department (MCM)** would focus on (i) leading or co-leading outputs on the financial stability aspects of climate change and the role of sustainable finance, including in the context of multilateral surveillance; (ii) climate-related risk analyses and stress testing including climate model calibration; and (iii) regulation and supervision to assess the effectiveness and adequacy of various regulatory responses and recommend adaptations to central bank's balance sheets and operations. It would support country teams, including by developing climate-related analytical tools and provide climate-related CD. MCM economists may also reinforce country teams for Article IV consultations.
- The **Research Department (RES)** would produce and coordinate outputs on adaptation, mitigation, and transition issues, with a focus on the macroeconomic, global and political economy angles. It would spearhead analytical work, including on the multilateral dimensions of climate mitigation and analysis of energy transition and implications for commodity markets, in the context of the WEO, the WEMD and the G20. Through the tailoring of its macroeconomic models to individual country circumstances, RES staff would support analysis of mitigation and adaptation policies by country teams for Article IV consultations and by regional divisions in area departments, as well as scenario analysis for FSAPs and CMAPs. The department would organize an annual IMF research conference on the economics of climate change and support internal training
- The **Strategy, Policy and Review Department (SPR)** would spearhead the IMF's policy development on climate issues in cooperation with other departments—for example, integrating climate aspects into lending operations or debt sustainability frameworks. It would develop guidance for country teams, conduct climate-specific review, support the IMF climate coordinator on adapting the Fund's overall strategy, and act as the IMF's climate collaboration hub with external bodies.

40. Area departments would also require reinforcements, as they are on the forefront of providing bilateral policy advice, performing regional surveillance, and coordinating in-country with

³⁵CD delivery would leverage to the extent possible existing structures including Regional Capacity Development Centers (e.g., CARTAC and PFTAC have already been active on climate issues).

development partners. There is a case for strengthening expertise on region-specific topics, such as resilience building to natural disasters in APD, AFR and WHD, transition risks for oil exporters in AFR and MCD, or regional climate change mitigation initiatives and policies in EUR. Area departments also would assist with the production of CMAPs—notably as regards the debt and financing implications of climate change and climate related policies—and follow up on the CMAP recommendations and other CD advice in Article IV reports. In addition to other resources, area departments would have a climate coordinator function to guide and operationalize climate work at the regional and country level, liaise with functional department climate hubs to bring the latest tools to bear on their department’s work, feedback country experiences and common policy questions to functional departments, and help on cross-country projects.

41. Other departments would require targeted reinforcements to step up climate work.

These reinforcements would typically be accommodated within the existing organizational structure and include reinforcing the capacity to deliver training and develop models for country applications (ICD), strengthening advice on legal issues related to climate change policies (LEG), and improving data quality and support data related capacity development (STA).³⁶

42. Greening the IMF’s own operations will require a concerted effort and is key for the institution’s credibility.

As the Fund redefines how to work and engage with members post-pandemic, it will do so with an eye to sustainability and by making some pandemic-related reductions in the IMF’s carbon footprint permanent.³⁷ This will involve developing a Fund-wide governance structure and defining goals and strategies. The intent is to develop a more robust environmental sustainability strategy, allowing the Fund to lead in environmental stewardship while maintaining its focus on serving the membership (Box 4).

B. Budgetary and Human Resources Implications

43. Despite a substantial reallocation, current resources are insufficient. Departments estimate that they spent \$28 million on climate in FY21 (of which \$1½ million is externally funded), compared with \$16.5 million (of which \$½ million is externally funded) in FY20. This spending corresponds to broadly 60 FTEs, with some \$2 million (about 7 FTE) being transitional resources.³⁸ The remaining 53 FTEs also include resources that have covered climate issues as part of the usual rotation and prioritization of macro-critical topics. While prioritization and rotation will continue for individual products, climate issues have become more salient and will have to be covered more regularly and for more countries, thus requiring additional resources.

³⁶Not included in this estimate are climate-related work on Fund-supported programs (FIN), provision of digital and cyber risk expertise to help countries align their digitalization strategies with their climate objectives (ITD), high-impact communication and outreach (COM), and support services (CSF). These costs would be included in the mark-up for overhead costs.

³⁷Any costs or efficiency gains will be discussed and reflected in annual budgets.

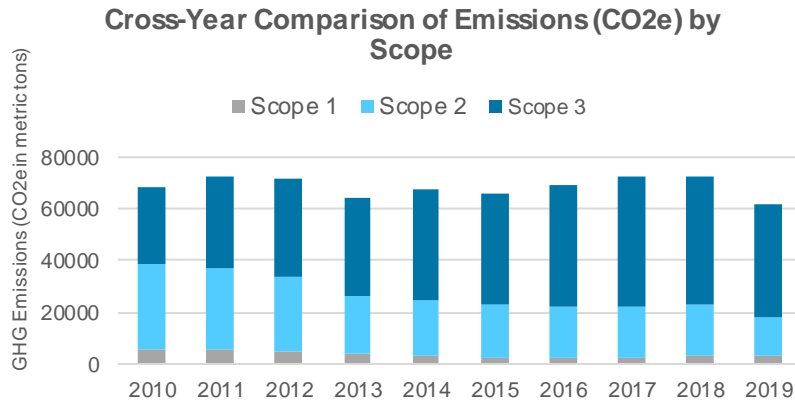
³⁸The 60 FTEs reflect staff working full time on climate, but also staff reporting only some of their time to climate.

Box 4. Greening the IMF

The IMF has sought to improve its environmental sustainability since 2009. This is through reductions in its energy and water consumption, material and food waste, and digitalization of Fund media and content. Between 2010 and 2019, the Fund’s total annual greenhouse gas (GHG) emissions decreased by 10 percent, mainly by reducing energy use by half. Other achievements include: (i) U.S. Environmental Protection Agency’s Energy Star building certification and (ii) Platinum recertification of the HQ2 building under the Leadership in Energy & Environmental Design (LEED) program. The Fund considers environmental sustainability in the planning of all building and facilities-related projects with the intent to reduce the

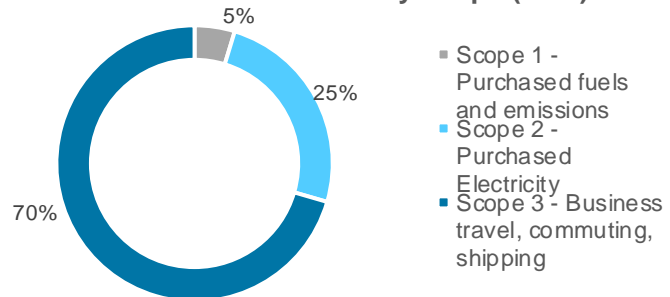
impact on the environment, while meeting the Fund’s business needs and focusing on the health and safety of staff, other building occupants, and the surrounding communities.¹

Efforts to green the Fund’s operations go hand-in-hand with the modernization agenda. Investments in modernization



and the ‘future of work’ will not only serve to make the Fund more effective and resilient but can also have a substantial positive impact on its carbon footprint. The pandemic has shown that the Fund can serve its members effectively and at a much lower cost to the environment than in the past. Pre-pandemic measures of the Fund’s carbon footprint underscore the

Fund GHG Emissions by Scope (2019)



importance of business travel, representing 70 percent of the Fund’s total carbon footprint in 2019. As such, investments in virtual meeting capabilities provide an opportunity to strengthen member engagement, reduce travel and curtail GHG emissions. Greater use of telework, as envisaged under the ‘hybrid work model,’ will provide an opportunity to reduce the environmental impact of staff commuting. With time and upfront investment, this could result in reduced Fund HQ space needs, and thus have positive environmental and budgetary impacts. Transitioning to renewable energy operations at HQ and in field offices may reduce energy consumption in the longer term but will require investments in the short term. A transition to environmentally friendly vehicles in the field and at HQ has recently started (under the lifecycle replacement program) and will reduce purchased fuels and emissions.

¹Emissions include all HQ operations and travel booked through the Fund’s travel agent; field office operations are not currently included.

44. Staff estimates that an addition of about 95 FTEs would be needed to ensure that the Fund can cover most macro-critical aspects in its climate work in the steady state, while relying on other institutions where these have a comparative advantage. To determine how many additional

staff would be needed to enable the Fund to implement the proposed strategy in the steady state, i.e., after the upscaling has been completed (see below), staff engaged in a detailed bottom-up resource exercise. About 60 percent of the additional resources would go to direct country engagement (to be augmented to two thirds by CD financed from donor support; see below). Some 37 percent would go to enhanced regional surveillance, policy development, and tools to support direct country engagement in providing customized advice. A small share would go to support activities. As it will take some time to hire and train the new staff and to build the structures for implementing this strategy, a transition period of 3 years will be required before the new steady state will be reached, including full delivery of the outputs sketched in the previous section.

Direct Country Support³⁹

45. As outlined in the previous section, **the strategy envisages climate coverage in roughly 60 Article IV consultation reports each year**, with about two thirds on mitigation/transition and the remainder on adaptation issues. Overall, this would suffice to engage with each member on macro-critical climate issues every 5–6 years.^{40, 41} Functional departments would support area department teams through mission participation and contributions to analytical papers, as well as models and toolkits tailored to country specific circumstances. This interaction between department, assisted by area department climate coordinators, would also help knowledge transfer and encourage mobility between the climate hubs and area departments.

46. All FSAPs (about 12 per year from currently 2) would cover climate-related physical and transition risks, including climate stress testing, assessment of regulation and supervision, data disclosures, and the climate-adequacy of regulatory frameworks. The additional unit costs would be about 0.5 FTE. FSAP mission teams would be supported by reference notes, modeling support from RES, and assistance on legal issues. The findings of these FSAPs would be integrated in the corresponding Article IV consultation reports.

47. CD delivery would be scaled up significantly from a low base, reflecting inter alia the need to meet requests by country authorities to assist with implementing Fund advice from the in-depth Article IV consultations. Staff would seek additional donor support to augment internally-funded CD, including for CMAP and external training as well as for fiscal, statistical and financial

³⁹Any climate issues related to a Fund-supported program is covered under this estimate (potentially leading to an underestimation if there was a substantial increase of climate-coverage in the context of programs).

⁴⁰Climate coverage in Article IV consultations is costed on average at 0.4 FTE (0.25 FTE for an Article IV accompanied by a CMAP), accounting for the fact that climate change issues are additional to country teams' current work to ensure that other priority topics are not crowded out. This estimate reflects that integrating climate issues will require the country teams to look into all aspects of macroeconomic policies—in the fiscal, monetary, and financial sectors. The estimate also assumes that 65 additional country teams would spend 0.1 FTE per year to follow up on previous Art. IV consultations and stay current on climate issues.

⁴¹This category also includes review.

Table 5. Additional Resource Needs for New Deliverables

	IMF01	IMF02	Total	IMF01	IMF02	Total
	FTEs			Percent		
Total	95	20	115	100	100	100
Direct Country Engagement	56	20	76	59	98	66
Article IV Consultations	30	0	30	32	0	26
FSAPs	6	0	6	6	0	5
CD	15	20	35	16	98	30
CMAPs	5	10	15	5	50	13
Other	10	10	20	11	47	17
Area Department Coordination	5	0	5	5	0	4
Multilateral Surveillance, Analytics and Policy	35	1	35	37	2	31
Multilateral Surveillance	10	0	10	11	0	9
Other research and analytics	11	0	11	11	0	9
Policy development & tools	14	1	15	15	2	13
Support activity	4	0	4	5	0	4

Source: Authors.

issues. To this end, the Committee on Capacity Building has already designated climate change as a topical growth area for CD. IMF01-funded CD would be targeted to the most urgent needs, especially for low-income countries, as well as those that are unlikely to be covered by IMF02 resources. The outputs below include donor-funded activities.

- There would be 10 **CMAPs** per year (from currently 2) at a cost of up to 2 FTE. The main findings and policy recommendations would be integrated in the corresponding Article IV consultation reports.
- About 90 additional (compared to the status quo) **single-country CD** per year have been costed at a unit cost of 0.2–0.3 FTE. Climate-related single-country CD would be complemented by how-to climate notes that offer practical advice from staff to policymakers on selected economic issues.⁴²
- **External training** would be bolstered through adapting existing course materials to include flexible climate change modules, including one full-fledged climate-related macroeconomic course would be delivered 5–6 times a year.⁴³

⁴²[How-to notes](#) are a new publications series started in 2016 that offers practical advice to policymakers on important issues.

⁴³The unit costs for the delivery of an external course is estimated at 0.1 FTE.

Multilateral Surveillance, Analytics, and Policy

48. As in previous years, *flagships* would, as relevant, include high-impact climate-related chapters. Staff would significantly expand climate work in regional surveillance reports, however, highlighting cross-country work. Particularly at the beginning of implementing the strategy, this would help cover a broader swath of countries and also help to quickly raise awareness of climate issues both with country teams and with authorities.

49. Functional departments expect to present 1–3 additional *Board papers* per year.⁴⁴ Staff expects that in the first years of implementing the strategy, there would likely be a larger number of policy papers, given that the IMF's policies with regard to macro-climate issues are still being developed. Some of these papers are expected to be conceptual in nature as they would be breaking new ground (for instance, the measurement of natural capital). In some cases, a series of Board papers might be needed over a couple of years to fully cover and develop a topic. The policy papers would be complemented by a new series labeled *staff climate notes* that would showcase the latest policy-related analysis and research being developed by individual IMF staff and are published to elicit comments and further debate, aimed at a broad audience interested in climate issues. Staff plans to issue about 3–7 climate notes per year.⁴⁵

50. Functional department would support country teams by following up on policy papers with *guidance notes* and other types of guidance, such as how-to notes and templates. The emphasis would be on coverage requirements, analytical tools—such as in-house models and toolkits—data sources, even-handed application of IMF policy positions while taking into account country-specific circumstances, and best practice examples. This item also includes support for maintaining and upgrading the climate data dashboard as well as small refinements as otherwise the dashboard risks becoming obsolete; and climate-specific legal support related to surveillance and Fund-supported programs. Lastly, there would be a need to increase resources for coordination and networking with internal and external stakeholders, which is expected to result in better products for members. FTE resources would need to be complemented through forward-looking, highly granular, sectorized and geo-spatial data on physical and transition risks. Such data are critical to support policy analysis and would be used to support and mainstream climate issues into broader multilateral and bilateral surveillance including FSAPs, analytical work, capacity development and potentially lending programs.

Support Activities

51. Given the dearth of climate-literate economists, internal training will be essential. The short “climate 101” course will be mandatory to ensure that all Fund economist become conversant in basic climate issues; this course will be offered 3–4 times per year focusing on the broad macroeconomic effects of climate change and policies to address them. For staff working on countries facing the specific issues, a “Climate Bootcamp” would be offered 3–4 times per year. The

⁴⁴At an average unit cost of 2 FTE; large variation would be expected across papers.

⁴⁵Climate notes are costed at 1.5 FTE on average.

Bootcamp would aim at using analytical tools to carry out macro policy scenario analysis and—through modules—develop more in-depth policy expertise geared either to specific issues—such as carbon pricing—or specific country types (e.g., countries vulnerable to natural disasters). To promote continuous learning as staff experience accumulates, staff would organize 4–6 peer-to-peer learning events per year and establish a venue for collaboration where staff can share lessons from their climate change work in surveillance, lending, and CD activities.⁴⁶ Course materials would be designed in a way to allow for a variety of delivery modalities, including blended formats. Finally, to ensure internal training remains varied and relevant, external climate experts would be hired to provide training seminars (e.g., academics in those universities that are developing graduate programs in climate economics). Support activities also include legal support related to institutional aspects such as facilities and HR policies.

Other Issues

52. Most of the additional FTEs would consist of macroeconomists. Prior knowledge of climate issues would be ideal, but the expectation is that most of these new staff would need to be trained on climate issues because there is a limited supply of climate macroeconomists on the market. The higher the share of recruits with a strong background in climate and environmental economics, the more rapidly could the climate strategy be scaled up. These macroeconomists would be complemented by some climate/operational experts (the latter particularly for CD activities) and legal experts; political economy expertise might be needed as well. At the same time, current macroeconomists would be trained to enable them to also spend part of their time on climate. Given the scale of the increase, there also is a need for some managerial and administrative staff. In particular, and there might be a need to look at how resources are organized in departments if the additional resources strain spans of control in existing divisions or units.

53. The pace of upscaling would need to be cognizant of market conditions and the Fund's own absorption capacity. The IMF would adopt a dual strategy whereby it would hire quality over speed to allow time for training, while engaging in partially accelerated hiring for those with scarce skill premia. It should also be noted that for new hires, recruitment of diverse staff may take longer, arguing for starting early to enhance diversity. While a comprehensive HR strategy remains to be worked out, hiring would likely need to be phased in over 3 years.

C. Risk Assessment

54. Stepping up the IMF's engagement on climate change as proposed in this strategy will help mitigate reputational and strategic risks to the Fund. Engaging on the macro-critical aspects of climate change would enable the IMF to assist its members with one of the most critical macroeconomic and financial policy challenges of the coming years and decades, and would reduce the risk of the IMF being perceived as unresponsive to new challenges. At the same time, the proposal is creating new risks, such as the IMF being perceived as venturing into environmental

⁴⁶The "climate 101" course, climate bootcamps, and peer learning events have been costed with 0.25 FTE per activity.

issues and therefore as overstepping its mandate. Further, not properly resourcing the new climate mandate could increase business risks by straining other critical issues central to the IMF mandate and could result in reduced quality and traction of the Fund's advice across the spectrum, in turn affecting its reputation. These risks need to be managed carefully, including by (i) limiting the engagement to issues with a clear link to macroeconomic and financial stability; (ii) clearly communicating the scope and limitations of the IMF's engagement; and (iii) properly resourcing the new mandate and the acquisition of skills, including time for transition and training. Still, a residual risk remains and will have to be accepted.

CONCLUSIONS

55. Climate change has emerged rapidly as a cause of critical macroeconomic and financial policy challenges that will, in some shape or form, affect all members of the IMF in the coming years and decades. For the IMF to live up to its mandate, it needs to assist its membership with addressing these challenges, from building resilience against climate change over climate change mitigation to managing the transition to a low-carbon economy. The IMF can also play a useful role in assisting with coordinating the global macroeconomic policy response to climate change, given the global public good character of climate change mitigation.

56. To be able to live up to its responsibility, the capacity of the IMF to conduct high-quality climate work needs urgent reinforcement. To date, the IMF's engagement on climate to date has mostly been arranged by reallocating resources within a flat budget and by increasing demands on existing staff, an approach that has reached its limits.

57. Broadening and deepening the IMF's engagement on climate is needed across a large number of activities. Climate change-related policy challenges need to be covered at much greater frequency and depth in Article IV consultations, with the objective to discuss macro-critical challenges most relevant for countries at least every 5–6 years, and more frequently in the areas of climate change adaptation and mitigation. Financial Sector Stability Assessments should routinely analyze the impact of climate change and transition risks on the financial sector. CMAPs should be turned into a key tool for IMF analysis in climate-vulnerable countries. Other CD needs to increase in line with the demands from the membership. Flagships and policy papers are needed to disseminate analysis and policy positions on climate-related policy challenges. Finally, all this work needs to be anchored in the development of models and toolkits, data guidance, and review.

58. Staff estimates that about 95 FTEs are needed to live up to the challenge sketched above, while preventing that other key portions of the IMF's work would be crowded out; this would need to be complemented by externally-funded CD of another 20 FTEs to ensure that members can implement Fund policy advice. While this is no negligible number, it appears modest compared to the benefits that increased engagement on climate issues could bring. Much of the additional resources would be invested to strengthen bilateral country engagement and would therefore be to the direct benefit of the membership, be it through analyzing policy options for climate change adaptation, strengthening financial sector resilience to climate change, assisting

with the design of economically and socially balanced strategies to transition to a low-carbon economy, or improving climate-related fiscal planning. Indirect benefits for the membership would materialize if the IMF can facilitate policy coordination on climate change mitigation—employing its role as a trusted advisor who interacts with almost all governments across the world—or help boost climate financing to support the efforts of low-income and other climate vulnerable countries.

59. The main risk is for the IMF to engage too little, rather than too much, on the macroeconomic and financial policy challenges related to climate change. An under-resourced effort would risk that the quality and frequency of engagement with the membership is uneven, which would undermine credibility and traction. It would also force the IMF to choose between engagement on climate and other macro-critical issues. In engaging, the IMF would stick closely to its mandate and area of expertise—macroeconomic and financial stability—and coordinate its efforts as closely as possible with other stakeholders, both to maximize effectiveness and to complement its own analysis with insights where other institutions have a comparative advantage.

ISSUES FOR DISCUSSION

- Do Directors agree that the Fund’s role would need to evolve in light of climate change emerging as one the most critical macro-economic policy challenges that the IMF’s membership will face in the coming years and decades?
- Do Directors agree that the proposed strategy will ensure that the Fund can continued to fulfill its mandate?
- Do Directors see any further areas that could be considered to better serve the membership?
- Do Directors agree with the request for additional resources that would be necessary to ensure Fund’s effectiveness in this area?

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