



IMF POLICY PAPER

May 2021

2021 COMPREHENSIVE SURVEILLANCE REVIEW— BACKGROUND PAPER ON INTEGRATING CLIMATE CHANGE INTO ARTICLE IV CONSULTATIONS

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:

- The **Staff Report**, prepared by IMF staff and completed on April 7, 2021 for the Executive Board's consideration on May 10, 2021.

The IMF's transparency policy allows for the deletion of market-sensitive information and premature disclosure of the authorities' policy intentions in published staff reports and other documents.

Electronic copies of IMF Policy Papers
are available to the public from
<http://www.imf.org/external/pp/ppindex.aspx>

International Monetary Fund
Washington, D.C.



April 7, 2021

2021 COMPREHENSIVE SURVEILLANCE REVIEW— BACKGROUND PAPER ON INTEGRATING CLIMATE CHANGE INTO ARTICLE IV CONSULTATIONS

EXECUTIVE SUMMARY

Climate change has emerged rapidly as a pressing challenge for macroeconomic policymakers. Among other things, climate change redistributes income and affects asset valuations, with repercussions for public and private sector balance sheets, financial flows and financial stability, trade, and exchange rates. Fiscal policies are key for mitigating climate change and ensuring a socially balanced transition to a low carbon economy. Countries that are vulnerable to natural disasters need to build fiscal space and deepen access to financing in order to build resilience.

While the IMF has been involved in the climate debate since at least 2008, a systematic account of how to integrate climate change into surveillance has been lacking to date. This paper seeks to fill the gap. It argues that *domestic* policy challenges related to climate change—such as adaptation efforts for climate vulnerable countries, or policies to deliver a country’s Nationally Determined Contribution under the Paris climate accord—are covered by the IMF’s bilateral surveillance mandate and therefore valid topics for Article IV consultations wherever these challenges cross the threshold of macro-criticality. Climate change mitigation is a *global* policy challenge and therefore falls under multilateral surveillance. The paper proposes a pragmatic approach that focusses especially on the mitigation efforts of the 20 largest emitters of greenhouse gases.

Approved By
Ceyla Pazarbasioglu

Prepared by Johannes Wiegand (SPR). The paper is based on the work of an interdepartmental group that included Florence Jaumotte (RES), Catherine Pattillo (AFR), Julianne Ams, Nadia Rendak (both LEG), James Daniel, Ian Parry, James Roaf (all FAD), Prasad Ananthakrishnan (MCM), Martin Cihak, Tito da Silva and Johannes Wiegand (all SPR), and that worked under the general guidance of Sanjaya Panth (SPR)¹

CONTENTS

INTRODUCTION	3
CLIMATE CHANGE AND THE IMF'S SURVEILLANCE MANDATE	4
CLIMATE CHANGE MITIGATION IN ARTICLE IV CONSULTATIONS: THREE ISSUES	7
A. Does the ISD Contain a Mandate to Discuss Climate Change Mitigation in Article IV Consultations?	7
B. What Yardsticks Should Article IV Consultations Use to Assess the Adequacy of Mitigation Efforts?	10
C. How Specific Should the IMF's Mitigation Policy Advice Be?	11
SUMMARY AND CONCLUSIONS	13
FIGURES	
1. Example of an Adaptation Challenge: Climate-Related Natural Disasters: 1980–17	5
2. Example of a Transition Risk: Fiscal Revenue Losses for Oil Exporter	5
3. The Largest 20 Greenhouse Gas Emitters	8
4. Economic Impact of a US\$50 Carbon Tax by 2030	10
5. Effective Carbon Price and Perceived Institutional Quality	12
ANNEXES	
I. The Legal Framework for Article IV Consultations as it Pertains to the Coverage of Climate Change	15
II. The Detrimental Impact of Climate Change on Growth and Macroeconomic Stability	18
References	20

¹ Catherine Pattillo was in FAD when most of the work of the interdepartmental group was conducted, Martin Cihak in MCM.

INTRODUCTION

1. The IMF has been involved in the climate change debate for more than a decade. In 2008, 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” and concluded that “climate change can be addressed with minimum damage to the economy, if policy solutions follow some basic principles.”

2. The IMF’s contributions to the climate change debate have been manifold and impactful. Since 2008, IMF staff has published numerous policy papers and chapters in flagship publications (WEO, GFSR, Fiscal Monitor) and Regional Surveillance Reports on climate-related policy challenges. Climate change has also been covered in country-specific Article IV reports and Financial Sector Stability Assessments. On substance, IMF contributions have focused on topics with a close link to macroeconomic management, such as carbon pricing, energy subsidies, resilience building to natural disasters, or containing the impact of climate change on financial stability. For a small number of pilot countries, in-depth Climate Change Policy Assessments (CCPAs) have been conducted jointly with the World Bank, which have served as inputs into Article IV reports, especially on resilience building and climate change adaptation.

3. However, coverage of climate change in Article IV reports has been largely ad-hoc, driven primarily by the interests of country authorities and IMF country teams. This has given rise to questions to what extent such coverage is consistent with the IMF’s surveillance mandate, expertise and comparative advantage relative to other institutions. Views on this issue differ: some stakeholders argue that climate change should play a key role in IMF surveillance, given the grave repercussions of unconstrained global warming for macroeconomic and financial stability, as well as the macroeconomic significance of policies needed to meet countries’ mitigation and adaptation objectives. Others, however, advise caution, viewing climate change primarily a topic for environmental rather than economic policies—and therefore as an area where the IMF has limited expertise.

4. This background paper seeks to clarify to what extent climate change is a relevant topic for IMF surveillance. Among other things, it seeks to address the following questions:

- What macroeconomic policy challenges arise in the context of adapting to/seeking to contain climate change?
- To what extent does the IMF’s surveillance mandate allow/call for covering climate change related policies in Article IV consultations, and what are the relevant criteria for when and whether to include climate change?
- What climate-related topics should IMF surveillance cover?
- How specific should the IMF’s advice be on climate-related policies?

5. The focus of this paper is squarely on conceptual and strategic issues. How to cover climate in surveillance in practice will be elaborated on in subsequent guidance. A parallel workstream focusses on integrating climate change issues into Financial Stability Assessments; the results from this workstream will be summarized in the FSAP-review that is proceeding in parallel with the Comprehensive Surveillance Review.

CLIMATE CHANGE AND THE IMF'S SURVEILLANCE MANDATE

6. The IMF's surveillance mandate is defined by the Articles of Agreement and elaborated further in the 2012 Integrated Surveillance Decision (ISD). The ISD made Article IV consultations a vehicle for both bilateral and multilateral surveillance, and thereby provides two angles for when a topic should be discussed (see Annex I for a more complete description of the legal surveillance framework as it pertains to the coverage of climate change):

- **Bilateral surveillance/direct impact.** In its bilateral surveillance, the IMF “will focus on policies that can significantly influence present or prospective balance of payments and domestic stability” (ISD¶16).
- **Multilateral surveillance/spillovers.** As part of multilateral surveillance, Article IVs consultations “shall include a discussion of the spillover effects of a member’s exchange rate and domestic economic and financial policies that may significantly influence the effective operation of the international monetary system, for example, by undermining global economic and financial stability”. (ISD¶26).

Policies and topics that fall outside these parameters can still be discussed in Article IV consultations, provided there is agreement with the member.²

7. For assessing how climate change relates to this mandate, it is helpful to distinguish between the three types of policy challenges.

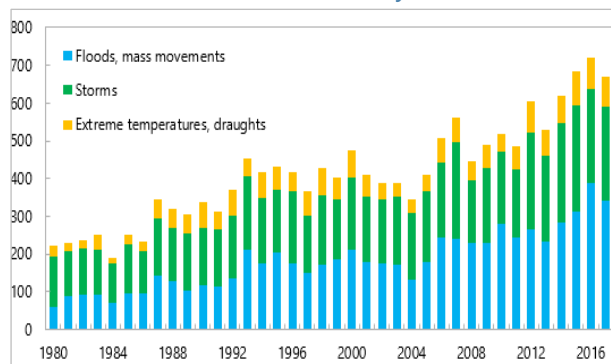
- **Climate change mitigation.** Mitigation policies seek to contain global warming, primarily by limiting and/or offsetting the concentration of greenhouse gases in the atmosphere. Mitigation is a *global policy challenge*: no individual country can provide sufficient climate change mitigation on its own. A country can, however, make an appropriate contribution to the global mitigation effort.³

² The IMF's policy advice on these issues is in the legal sense technical assistance rather than surveillance, but can be included in the member's Article IV consultation report.

³ Put differently, climate change mitigation is a global public good. As with other public goods, mitigation will be undersupplied in the absence of an effective coordination and enforcement mechanism.

- Adaptation to climate change.** Adaptation policies deal with and/or prepare for the economic and social consequences of climate change. This includes the need to build resilience to natural disasters and other disruptive weather patterns—events that are bound to increase in both frequency and intensity with climate change. Beyond resilience building, adaptation also encompasses issues like financial regulation to contain stability risks from possible climate-induced losses, or the need for monetary policy to deal with larger shocks and heightened volatility. Adaptation is a *domestic policy challenge*.

Figure 1. Example of an Adaptation Challenge: Climate-Related Natural Disasters: 1980–17
(Number, in each year)

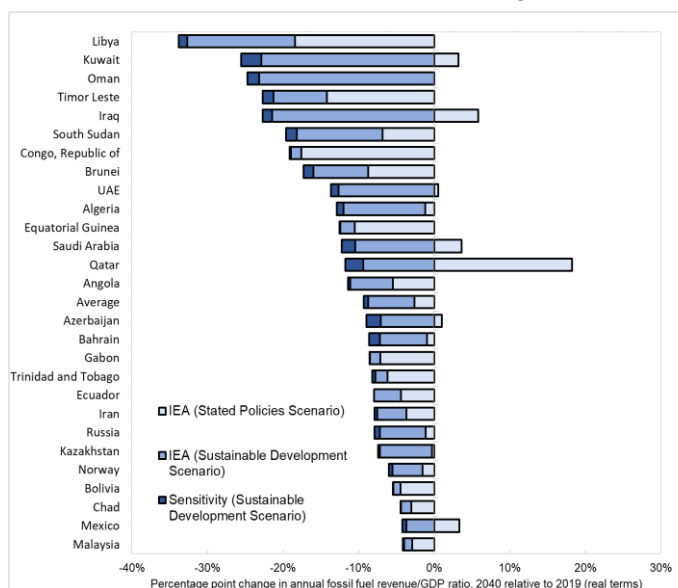


Source: Munich RE.

- Manage the transition to a low-carbon economy.** As countries move to a low-carbon mode of production, another set of policy challenges can emerge—triggered either by a country’s own or by global mitigation efforts. As adaptation, transition management is a domestic policy challenge.

An example of transition management in response to a country’s *own* mitigation efforts are challenges that arise in the context of delivering a country’s Nationally Determined Contribution (NDC) under the Paris accord: how to modify taxes and/or environmental regulations, and how to offset potential negative impacts of such measures on equity, labor markets, or external competitiveness.⁴

Figure 2. Example of a Transition Risk: Fiscal Revenue Losses for Oil Exporter



Source: IMF staff estimates. Analysis estimates long-term revenue impact under climate mitigation scenarios using the IEA’s World Energy Outlook fossil fuel production scenarios. The IEA’s Stated Policies Scenario broadly reflects the adoption of Nationally Determined Contributions under the 2015 Paris Agreement, and the Sustainable Development Scenario reflects a path which meets the 2°C target.

⁴ Mitigation and domestic transition management are related and the dividing line between them can be somewhat blurry. As discussed above, for the purpose of categorizing climate-related policies in the context of IMF surveillance

(continued)

Transition management in response to *global* mitigation efforts includes the need for fossil fuel exporters to diversify their export base and address the fiscal impact of lower oil receipts in response to global de-carbonization efforts.

8. The Integrated Surveillance Decision contains a clear mandate to cover the *domestic policy challenges related to climate change*—provided they cross the threshold of macro-criticality. Specifically, coverage in Article IV consultations is called for where (i) climate change creates a need for adaptation in order to preserve present or prospective BOP and domestic stability, or where (ii) the need to manage the transition to a low-carbon economy gives rise to policy challenges that can significantly influence present or prospective BOP and domestic stability (ISD¹⁶).

9. Adaptation and transition management are potentially relevant for large part of the IMF’s membership.

- As discussed above, ***transition management*** is a possible topic for every country with an NDC, as most countries will need to adjust macroeconomic policies to meet their obligations under the Paris agreement. Transition management often includes policy challenges that are fiscal or financial in nature, and therefore are well within the realm of IMF expertise: tax policies to incentivize the reduction of greenhouse gas emissions, designing redistribution schemes to mitigate the social and labor market impact of mitigation measures, or reinforcing financial regulation to contain risks from ‘stranded assets’ (see IMF, 2020a, for a discussion of a comprehensive policy package).
- ***Adaptation*** is relevant for a wide range of countries that are vulnerable to natural disasters, but also to slower-moving, climate-driven phenomena, such as rising sea levels or droughts that can, for example give rise to migration pressures. Adaptation requires resilience building along several dimensions (IMF, 2019a, 2020b). Among these, building financial resilience to climate change is well-aligned with macroeconomic analysis, especially the need to build fiscal buffers for climate vulnerable countries. Policies to build physical resilience, by contrast, often require a different type of analysis—such as the selection and evaluation of public investment projects for climate-resilient infrastructure. Drawing on or cooperating with other institutions is hence important for in-depth coverage.
- ***Climate finance*** can be relevant for the discussion of both transition management and adaptation, especially for countries that are less endowed with resources and that need to

it is helpful to distinguish between domestic policies on the one hand, and policies with a global/cross-border component on the other—such as containing negative spillovers and/or contributing to the provision of a global public good. In line with this categorization, policies to achieve a *given domestic target* (such as an NDC) are discussed here under “transition management”, while “mitigation” covers *a country’s contribution to the global climate change mitigation effort*. An implication is that measures well-suited to achieve a country’s NDC may not result in an adequate mitigation policy if the NDC itself is insufficient (see the discussion below). In practice, Article IV reports will typically discuss mitigation and transition management as a package.

implement large-scale investments to transition to a low-carbon mode of production and/or to adapt to climate change.⁵

10. Different from transition management and adaptation, climate change mitigation is not primarily a domestic policy challenge: mitigation efforts of even the largest economies in isolation will not suffice to contain global warming and its harmful economic and financial repercussions. As a result, it seems improbable that a lack of mitigation effort would undermine a country's stability directly.

11. This suggests that climate change mitigation is a theme for multilateral rather than bilateral surveillance and should be discussed in the context of the ISD's spillover provision. Several conceptual and practical issues arise when applying the spillover provision to climate change, however; these are discussed in the next section.

CLIMATE CHANGE MITIGATION IN ARTICLE IV CONSULTATIONS: THREE ISSUES

A. Does the ISD Contain a Mandate to Discuss Climate Change Mitigation in Article IV Consultations?

12. The macroeconomic relevance of climate change mitigation is beyond doubt.

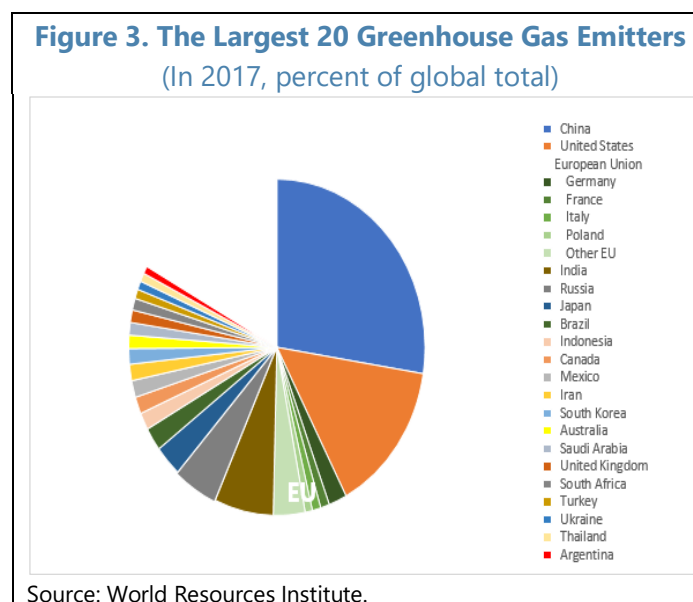
- **Global warming.** According to the Intergovernmental Panel on Climate Change, unmitigated global warming would raise average global temperatures by the end of this century to more than 4°C above pre-industrial levels. This would exceed temperatures experienced at any time in the past 3 million years (and hence since the emergence of mankind). Global warming is driven primarily by the emission of greenhouse gases, with carbon dioxide accounting for about three-quarters of the total impact.
- **Economic damages.** Such a degree and pace of warming is bound to have severe macroeconomic and financial repercussions. While economic damage estimates are inherently uncertain—reflecting inter alia the need to quantify events for which there are no experience values, such as higher sea levels, surges in vector-borne diseases, and more frequent and severe natural disasters—the literature points to GDP-losses large enough to matter in net-present-value terms. This implies that present-day policy makers should seek to mitigate climate change—see Annex II for a more complete discussion of economic damages from climate change.

⁵ This principle—developed countries are to provide financial resources to assist developing countries with achieving their climate objectives—is also inscribed into the Paris agreement.

- **Risk management.** Unconstrained warming also holds a sizeable potential for potentially catastrophic “tail risks”. Minimizing the likelihood for such risks provides a second, risk management rationale for mitigation action.
- **Distributional aspects.** Climate-related damages are expected to be distributed unevenly, harming countries disproportionately that are already hot and—often—poor. Thus, global distributional and equity objectives also argue in favor of mitigation action. Losses would extend beyond GDP to welfare indicators such as mortality, health indicators, and displacement cost.

13. Global macroeconomic relevance does not translate automatically into an IMF surveillance mandate at the individual country level, however. The critical provision in the ISD is that the spillovers from a member’s policies may *significantly* influence the effective operation of the international monetary system, for example, by undermining global economic and financial stability. While it is evident that climate change results from insufficient mitigation action, and that insufficient mitigation puts global economic and financial stability at risk, establishing which countries contribute “significantly” to this risk—as opposed to those that do not—is not straightforward.

- **Large emitters of greenhouse gases.** Given the close link between greenhouse gas emissions and global warming (see above), an intuitively compelling indicator for ‘significance’ is the share a country contributes to global emissions. Identifying the largest emitters is straightforward: the top three—China, the United States, the European Union (if considered in the aggregate)—account for about half of global greenhouse gas emissions. The difficulty is with drawing an exact line where “significance” begins or ends.



- **Alternative yardsticks.** Further, there are legitimate questions as to whether current greenhouse gas emissions are the right yardstick for significance. From a policy perspective, combatting climate change requires curbing future—not present-day—emissions. Hence, a policy angle would suggest a stronger focus on the mitigation policies of large, rapidly growing emerging markets. Conversely, from an equity or fairness perspective, past emissions also matter: advanced economy emissions have used up most of the atmosphere’s absorptive

capacity. One may argue that, as a result, advanced economies also bear greater responsibility for preserving whatever capacity remains.⁶

- ***Beyond emissions.*** While curbing greenhouse gas emissions is arguably the most important challenge for mitigating climate change, other policies are also systemically important, notably preserving (or destroying) carbon sinks such as rainforests.

14. To summarize, the implications of the ISD for the coverage of climate mitigation—or more precisely: a country’s contribution to the global mitigation effort—in Article IV consultations are somewhat indeterminate. On the one hand, the ‘significant spillover’ provision clearly points to a need to discuss mitigation systematically, especially with large emitters of greenhouse gases. On the other hand, it is difficult to translate this judgmental standard into a metric robust enough to underpin this assessment.

15. In view of this, IMF surveillance should take the following, pragmatic approach to covering climate change mitigation in Article IVs consultations:

- ***Coverage of a country’s contribution to the global mitigation effort will be strongly encouraged for the 20 largest emitters of greenhouse gases.*** For these countries, the expectation is that Article IV consultations would include a discussion of mitigation policies and their adequacy at least every three years. Keeping this group relatively broad ensures that the countries most relevant for climate change mitigation should be captured independent of the precise underlying metric. The “largest 20” group will be determined on the basis of current greenhouse gas emissions.⁷ Staff will update the list every 3 years or so.⁸
- ***For all other countries, coverage of mitigation will be encouraged but not necessarily expected.*** In practice, this means that climate change mitigation—or more precisely: a country’s contribution to the global mitigation effort—can be discussed if both the authorities and staff agree on coverage. However, country authorities and IMF country teams will need to weigh the relative importance of mitigation relative to other macroeconomic policy priorities to assess whether it merits coverage.

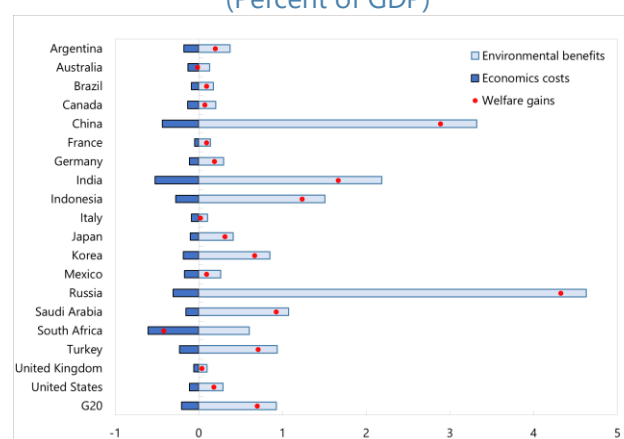
⁶ Per-capita emissions are also sometimes suggested as an indicator to reflect equity considerations.

⁷ In contrast to backward or forward-looking metrics, current emissions can be observed without requiring elaborate estimates or assumptions. Current emissions also ‘compromise’ between the metrics discussed above and the various considerations that speak in their favor.

⁸ At present the list includes China, the United States, the European Union (to be covered in the report on common Euro area policies in the context of Article IV consultations with member countries), India, Russia, Japan, Brazil, Indonesia, Canada, Mexico, Iran, Korea, Australia, Saudi Arabia, the United Kingdom, South Africa, Turkey, Ukraine, Thailand, and Argentina. Within the European Union, the Article IV reports for Germany, France, Italy and Poland should also cover climate change mitigation (as they cross the “top 20” threshold when assessed on their own). Even though the IMF’s Article IV surveillance mandate pertains to individual members, covering mitigation in the report on common Euro area policies suggests itself, as many aspects of the members’ mitigation policies are determined at the European level.

- Beyond these recommendations, **there can be angles different from global mitigation objectives to engage**, notably the co-benefits of mitigation policies to reduce the cost from domestic pollution. In many emerging economies, such benefits are sizeable.
- **In terms of substance, coverage in Article IV consultations will seek to balance what is important with what macroeconomics can deliver.** This will typically include the analysis of emission trends and projections based on current policies, a description of the authorities' mitigation objectives and policies, and an assessment of their effectiveness, as well as options to further strengthen policies to minimize outward spillovers while promoting the country's own BOP and domestic stability (see the next section). More concise guidance will need to be developed in the period ahead.

Figure 4. Economic Impact of a US\$50 Carbon Tax by 2030
(Percent of GDP)



Note: G20 is a simple average. Economic cost is a comparative static efficiency cost for 2030 reflecting changes in consumer and producer surplus in fossil fuel markets.

Source: IMF staff calculations.

B. What Yardsticks Should Article IV Consultations Use to Assess the Adequacy of Mitigation Efforts?

16. Even-handed coverage of climate change mitigation requires ideally a yardstick about what mitigation effort is appropriate, i.e., what contribution a country should deliver to the global mitigation effort. This question goes beyond macroeconomics, however, and also stretches beyond the IMF's mandate and expertise (among other things, the adequacy of the mitigation may depend on country characteristics—see the discussion in the previous section). Working out a fair burden sharing for climate change mitigation needs to be resolved through a political process at this juncture.

17. A possible alternative could be to use a generally accepted yardstick that is already in the public domain. However, the most common indicators have shortcomings for their use in surveillance.

- **The NDCs under the Paris accord—short: 'Paris targets'**—are part of a multilateral process whose very objective is to deliver sufficient global mitigation. However, the Paris process advances in steps that involve periodic revisions, with the next round of revisions falling due in the fall of this year in the context of COP26. As they are defined presently, the Paris targets fall well short of delivering sufficient mitigation in the global aggregate. According to IMF estimates,

the Paris targets are consistent with global warming of about 3°C relative to pre-industrial levels by end-century, compared to the objective enshrined in the Paris accord to limit warming to 1.5–2°C (IMF, 2019b).

Further, the Paris targets imply fairly different mitigation efforts between countries: demanding in some cases, requiring little or no effort for others. As a result, questions about even-handedness would arise if the Paris targets were used as yardsticks in surveillance.

- **Many recent policy pronouncements on mitigation are formulated in terms of net carbon neutrality** by a certain date, typically 2040, 2050 or 2060. However, by their nature these are medium-term targets, with no mitigation effort specified for the near term. Hence—unless such targets are complemented by a short-term emissions objective—they fail to provide much guidance for the typical time horizon of an Article IV report (3–5 years).

18. Against this backdrop, IMF surveillance should take the following, pragmatic approach to mitigation yardsticks in Article IVs Consultations:

- The **starting point** will typically be a country’s National Determined Contribution.⁹
- Article IV reports will provide **relevant context** for assessing the ambitiousness of a country’s Paris target. In particular, (i) Article IV reports will stress that NDCs remain, at this stage and in the aggregate, insufficient to achieve the mitigation ambition enshrined in the Paris accord, and (ii) they will compare a country’s Paris target with that of peers—i.e., countries with similar income levels and economic structures. This will provide a useful benchmark to assess the appropriateness of mitigation objectives, without IMF staff setting mitigation targets itself.

C. How Specific Should the IMF’s Mitigation Policy Advice Be?

19. There is a fairly robust consensus among economists about the elements needed for an efficient, first-best climate change mitigation policy (IMF 2019b, 2020a).

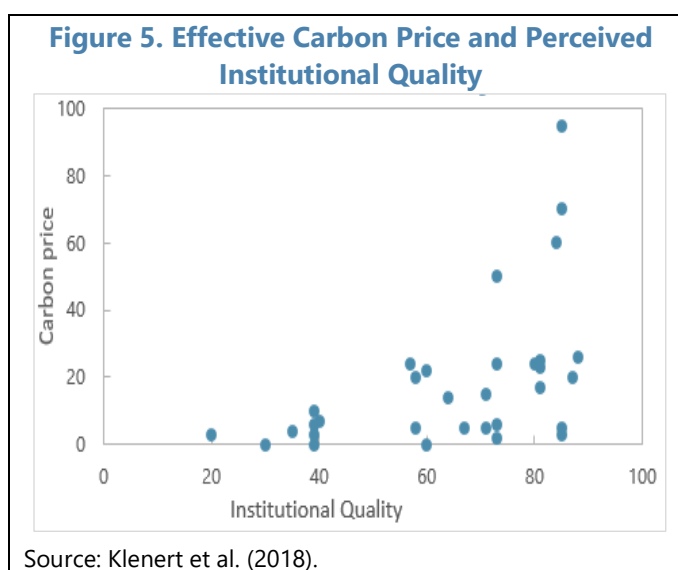
- **Comprehensive carbon pricing**, either in the form of a carbon tax or a broad-based emissions trading system. Carbon pricing promotes energy efficiency and shifts demand from dirty to clean energy sources; this also provides incentives for low-carbon investments. The revenues from carbon pricing can be used to reduce other distortionary taxes, to finance green investment, and/or to finance support to vulnerable groups most affected by mitigation policies. Regulations and/or feebate may need to complement carbon pricing in sectors that are hard to de-carbonize (for example, transport).

⁹ It can also be an otherwise defined domestic policy target, in particular when the latter is more recent than the NDC. In the rare case where a country does not have an NDC, a global yardstick implied by the Paris *objectives* may have to be used (not NDCs): measures equivalent to an average carbon price of US\$75 per ton in 2030 (IMF, 2019) and/or Net Carbon Neutrality by 2050. However, this question will require further elaboration should such a case arise.

A carbon-price based mitigation policy also facilitates the comparison of mitigation efforts across countries—which can provide the basis for a policy with global reach. Countries’ mitigation efforts could be coordinated, for example, by means of an international carbon price floor. Absent such an arrangement, cross-border differences in carbon prices could be mitigated through border carbon adjustments to avoid trade distortions and carbon leakage.

- **Structural policies** to address market failures and facilitate structural change. These can, for example, include green infrastructure investments (e.g., public monopolies such as electricity grids that tend to be under-supplied by the private sector) or incentives for R&D and ‘green’ technology deployment. More generally, a ‘green investment push’ would strengthen the macroeconomy in the short term and help lower the costs of adjusting to higher carbon prices (IMF, 2020a).

20. In practice, however, implementing a first best policy package can be challenging. Effective carbon pricing—that generates carbon prices high enough to have a significant impact on greenhouse gas emissions—has been introduced mostly in countries with high perceived institutional quality.¹⁰ Actual policy proposals (e.g., the “New Green Deal”) focus often instead on economically less efficient mitigation strategies, such as emissions regulation (that camouflages the shadow price of carbon) or measures to increase the supply capacity for green energy. In this context, it is important to note that boosting supply capacity *alone* is insufficient as a mitigation policy, as it fails to incentivize energy efficiency (IMF, 2020a).



21. Discussing climate change mitigation requires openness to different policy approaches. The purpose of multilateral surveillance is to discuss options to contain destabilizing spillovers, not to insist on specific policies.¹¹ Against this backdrop, IMF surveillance should take the following, pragmatic approach to mitigation policies:

¹⁰ A possible explanation is that confidence in governments to implement re-distributional policies is a prerequisite for making carbon pricing politically acceptable—where such confidence is lacking, carbon pricing thus risks running into political economy constraints.

¹¹ ISD 19 stipulates: “in the context of multilateral surveillance, the Fund may not and will not require a member to change its policies in the interests of the effective operation of the international monetary system. It may, however, discuss the impact of members’ policies on the effective operation of the international monetary system and may suggest alternative policies that, while promoting the member’s own stability, better promote the effective operation of the international monetary system.”

- Article IV reports will primarily **assess policies for whether they are effective for achieving mitigation** and therefore help contain potentially destabilizing climate spillovers.
- This said, **comparing an actual mitigation policy package with an economically (more) efficient package is legitimate.**
- **Article IV reports will typically discuss mitigation and the management of the transition to a low carbon economy as a comprehensive policy package.** This includes in particular measures to address distributional and competitiveness issues than can arise from climate change mitigation policies (IMF, 2020a).

SUMMARY AND CONCLUSIONS

22. To summarize, the IMF’s Articles of Agreement and the Integrated Surveillance Decision...

- **... contain a clear mandate to cover climate change adaptation and the management of the transition to a low-carbon economy in Article IVs** wherever the associated policy challenges are macro-critical. This includes a wide range of potential topics, for example, resilience building to natural disasters, or policies to achieve a country’s Nationally Determined Contribution in the context of the Paris climate accord. As with other surveillance topics, the assessment of macro-criticality—i.e. i.e., whether policies can significantly influence members’ present or prospective balance of payments and domestic stability—needs to be done on a case-by-case basis and prioritized relative to other policy challenges.
- **... point also to a need to discuss systemically countries’ contributions to the global mitigation effort under the ISD’s spillover provision, even though operationalizing this provision on the basis of a credible metric is challenging.** As a result, staff proposes a pragmatic approach that strongly encourages coverage of mitigation for the largest emitters of greenhouse gases, while stopping short of making it mandatory. Discussions should focus on options to contain the spillover from inadequate mitigation policies, which implies openness to different policy approaches. In case of agreement between country authorities and staff, more extensive and specific coverage is always possible.

23. In practice, the scope and depth of climate change coverage in Article IV consultations will depend on resource availability. Scaling up and intensifying the coverage of transition risk management, climate change adaptation, and mitigation will require significant additional resources—including staff that is ‘literate’ in both macroeconomics and climate, training, the development of toolkits, and better data.

24. Surveillance in the context of Article IV consultations should be complemented by regular discussions of climate-related policy challenges in IMF flagships (WEO, GFSR, Fiscal Monitor), regional surveillance reports and departmental papers. These publications are ideal outlets to cover climate change mitigation, given the global public goods character of mitigation policies.

Further, a large number of countries need to deal with transition management and adaptation; cross-country coverage will allow, *inter alia*, to analyze common challenges, identify best practices, and cover a wider range of diverse issues. Flagship reports also tend to do well in terms of traction.

Annex I. The Legal Framework for Article IV Consultations as it Pertains to the Coverage of Climate Change¹

1. **Many policies that are key for addressing climate change fall within the Fund’s surveillance remit.** While the Fund is not an environmental agency and its mandate does not include the protection of the environment per se, many aspects of climate change pertain to its mandate: for example, the effects of climate policies on domestic economic and financial performance, and the impact of climate change on global economic and financial stability. Such issues are relevant for the Fund’s bilateral and multilateral surveillance.

2. **Bilateral surveillance requires the Fund to oversee the compliance of each member with its obligations under Article IV, Section 1.**² Members have an obligation to collaborate with the Fund and other members to assure orderly exchange arrangements and to promote a stable system of exchange rates; and in particular: (i) to endeavor to direct economic and financial policies toward the objective of fostering orderly economic growth with reasonable price stability, with due regard to their circumstances; and (ii) to seek to promote stability by fostering orderly underlying economic and financial conditions and a monetary system that does not tend to produce erratic disruptions. In its bilateral surveillance, the Fund assesses whether a member’s exchange rate and other economic and financial policies promote the member’s own domestic and BOP stability. The legal framework for bilateral surveillance under Article IV is specified in greater detail in the Integrated Surveillance Decision (ISD).³

3. **In this context, there are three channels whereby discussion is mandatory, each with relevance for climate change.**
 - First, the ISD provides that the macroeconomic and macroeconomically relevant structural aspects of **monetary, fiscal and financial sector policies will always be covered**.⁴ Therefore, where such policies are being implemented or proposed and relate to climate change, they should be discussed.
 - Second, other policies must be discussed if they **significantly influence present or prospective balance of payments or domestic stability**.⁵ This can include, for example, structural policies

¹ Prepared by Julianne Ams and Nadia Rendak (LEG).

² Article IV, Section 1 and Section 3(a). Members also have obligations on the conduct of their exchange rate policies.

³ Decision No. 15203-(12/72), adopted July 18, 2012.

⁴ ISD para. 6: “In its bilateral surveillance, the Fund will focus on those policies that can significantly influence present or prospective balance of payments and domestic stability. ...[E]xchange rate policies will always be the subject of the Fund’s bilateral surveillance with respect to each member, as will monetary, fiscal, and financial sector policies (both their macroeconomic aspects and macroeconomically relevant structural aspects).”

⁵ ISD para. 6: “... Other policies will be examined in the context of surveillance only to the extent that they significantly influence present or prospective balance of payments or domestic stability.”

related to climate change that have stability implications. This determination of macro-criticality is country-specific.

- Third, Article IV consultations should assess “**inward spillovers,**” i.e., the actual or potential impact of global developments and policy actions in other countries on a member’s economic and financial stability, as well as the appropriate policy response.⁶ Many adaptation challenges—e.g., to rising sea levels that require investment in infrastructure—can be considered a consequence of inward spillovers. Transition risks can also be triggered by inward spillovers, such as changes in energy prices due to mitigation action by other countries.

4. Multilateral surveillance requires the Fund to oversee the international monetary system (IMS) to ensure its effective operation.⁷ While members obligations on the conduct of their exchange rate and other economic and financial policies are limited to the promotion of their own domestic balance of payment stability, members must consult with the Fund on issues pertaining to multilateral surveillance and provide information requested for that purpose. Recognizing that members’ policies may have a significant impact on other members and on global economic and financial stability, the Fund encourages members to implement exchange rate and domestic economic and financial policies that, in themselves or in combination with the policies of other members, are conducive of the effective operation of the international monetary system.⁸ Further, in its multilateral surveillance the Fund will focus on issues that may affect the effective operation of the international monetary system, including the spillovers from policies of individual members that may significantly influence the effective operation of the international monetary system, for example by undermining global economic and financial stability. A member’s policies that may be relevant for this purpose include exchange rate, monetary, fiscal, and financial sector policies, as well as polices respecting capital flows.

5. As Article IV consultations are a vehicle for both bilateral and multilateral surveillance, the ISD provides scope to discuss spillovers from climate related economic and financial policies in these consultations. In particular, Article IV consultations “shall include a discussion of the spillover effects of a member’s exchange rate and domestic economic and financial policies that may significantly influence the effective operation of the international monetary system, for example, by undermining global economic and financial stability”.⁹ In such a case, the Fund may “discuss the impact of a members’ policies on the effective operation of the IMS and may suggest alternative policies that, while promoting the member’s own stability, better promote the effective

⁶ ISD paras. 16, 17, Guidance Note for Surveillance Under Article IV Consultations, paras. 8, 23. This follows from the principle of integration of multilateral and bilateral surveillance, ISD para. 4.

⁷ Article IV, Section 3(a).

⁸ ISD para. 23.

⁹ ISD para. 26.

operation of the IMS.”¹⁰ Climate mitigation economic policies—or the lack thereof—would fall under this provision where they meet this standard.

6. Even if important climate-related policies fall outside of the parameters of bilateral and multilateral surveillance, it is legally possible to discuss them in an Article IV consultation with the agreement of the relevant member. While the surveillance framework defines the scope of issues that members are required to discuss with the Fund under Article IV, it is also possible for members to voluntarily agree to discuss other issues with the Fund in an Article IV consultation. The Fund’s policy advice on these issues would be technical assistance under Article V, Section 2 (b) and not surveillance but could be included in the member’s Article IV consultation report.

¹⁰According to footnote 10 of the Guidance Note for Surveillance Under Article IV Consultations, “outward spillovers are deemed significant if by themselves, or in combination with spillovers from other members’ policies, or through their regional impact, they would enter the macro-financial policy considerations of members representing a significant portion of the global economy.” There operational implications of “in combination with spillovers from other members’ policies” are not specified, however.

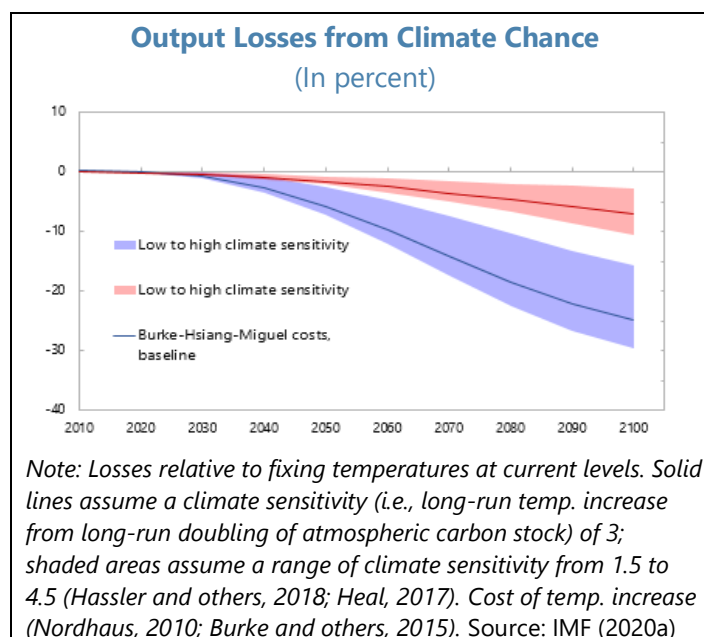
Annex II. The Detrimental Impact of Climate Change on Growth and Macroeconomic Stability¹

1. Climate change can have significant detrimental effects on macroeconomic stability acting through several environmental pathways, including rising global temperatures; greater frequency and intensity of natural disasters; rising sea levels and ocean acidification; changes in precipitation (weather patterns); and impacts on biodiversity. The economic pathways include lower productivity in agriculture and fishing, and due to the effect of hotter temperatures on outside work, more frequent disruption of activity and destruction of productive capital due to weather events and natural disasters, diversion of resources towards adaptation and reconstruction, increased morbidity and mortality due to more prevalent infectious diseases and natural disasters, increased climate-related migration pressures and risk of conflict, and the potential for catastrophic losses related to changes in ocean currents and key weather patterns such as monsoons.

2. Estimates of the economic cost of climate change are subject to a high degree of uncertainty, as the pace of increase in temperatures is unprecedented compared to the last 20,000 years, and temperatures could rise to levels that have not been seen in millions of years. Uncertainties also arise due to the mitigating effects of endogenous policy responses on the one hand, and amplifying effects due to potential non-linear climate shifts on the other.

3. There is broad agreement in the literature that the effect of rising temperatures on the level of GDP are non-linear. An increase in temperature raises GDP in countries where annual average temperatures are low, but reduces GDP where they are high. The tipping point is at an average temperature of about 13–15°C.² IMF estimates suggest that a temperature increase of 1°C in low-income countries lowers growth in the same year by 1.2 percentage points (IMF, 2017). While these historical estimates point to more moderate (or in some cases, positive) effects for colder regions, these do not include a number of damages (for

example, rise in sea levels, natural disasters, damage to infrastructure from thawing of permafrost in Russia) and negative global spillovers from large economic disruptions in other parts of the world.



¹ Prepared by Adil Mohommad, Oya Celasun and Florence Jaumotte (RES).

² See Burke, Hsiang and Miguel (2015); Dell, Jones, and Olken (2014); Carleton and Hsiang (2016); and Heal and Park (2016) for literature reviews.

- 4. Further, some estimates also suggest an additional impact of rising temperatures on growth** (e.g., Burke and others 2015), though this is open to debate. This would result in much larger GDP losses over the long term. In the absence of climate mitigation policies, losses in GDP could be of the order of 25 percent by 2100 relative to holding temperatures fixed at current levels (Figure).³
- 5. The fact that global warming has negative economic effects above 13–15°C matters for low-income countries, as many of them are in hotter parts of the world.** These are also countries which are more vulnerable, as they have less resources to invest in adaptation and resilience.⁴ Some estimates set output losses under unmitigated climate change at 60–80 percent by 2100 for hot-climate countries.
- 6. Moreover, there is the prospect of more frequent and intense weather events and natural disasters with unchecked climate change.**⁵ Low-income countries are more vulnerable to such events, which could reduce per capita income by 1.5 percentage points (compared to smaller, even negligible effects in emerging and advanced economies). Countries more prone to natural disasters may also experience slower convergence than less vulnerable countries.⁶
- 7. A major source of uncertainty in assessing the damages from climate change is around “tipping points.”** If critical environmental thresholds are crossed, this could lead to rapid locking-in of a new climatic state, with potentially devastating consequences. These types of situations are not currently factored into climate damage assessments. To give an example, melting of the Antarctic and Greenland ice-sheets would be a tipping element, as their melting could quickly become irreversible and lead to sea levels rising by several meters. The thawing of the permafrost is another potential tipping element, as it could release large quantities of CO₂ and methane currently locked away under the ice into the atmosphere, triggering a runaway greenhouse effect. Other tipping points include melting of the Himalayan glacier, change in monsoon patterns, and weakening or reversal of ocean currents.

³ IMF (2020a).

⁴ IMF (2017) and IMF (2020b).

⁵ These can be imperfectly captured in damage functions based only on temperatures.

⁶ Cantelmo, Melina and Papageorgiou (2019) find that disaster-prone countries grow by 1 percent less each year than non-disaster-prone countries, and that climate change may triple the growth gap.

References

- Burke, Marshall, Marshall, Solomon M. Hsiang and Edward Miguel (2015): “*Global Non-Linear Effect of Temperature on Economic Production*,” *Nature*, Vol. 527, pp. 235–239.
- Cantelmo, Alessandro, Giovanni Melina and Chris Papageorgiou: “*Macroeconomic Outcomes in Disaster-Prone Countries*,” IMF Working Paper 19/217.
- Carleton, Tamma A., and Solomon M. Hsiang (2016): “*Social and Economic Impacts of Climate*,” *Science*, Vol. 353, Issue 63047.
- Dell, Melissa, Benjamin F. Jones and Benjamin A. Olken (2014): “*What Do We Learn from the Weather? The New Climate-Economy Literature*,” *Journal of Economic Literature* Vol. 52(3), pp. 740–98.
- Hassler, John, Per Krusell and Conny Olovsson (2018): “*The Consequences of Uncertainty: Climate Sensitivity and Economic Sensitivity to the Climate*,” *Annual Review of Economics* Vol. 10, pp 189–205.
- Heal, Geoffrey (2017): “*The Economics of the Climate*,” *Journal of Economic Literature*, Vol. 55 (3), pp. 1046–63.
- _____ and Jisung Park (2016): “*Reflections—Temperature Stress and the Direct Impact of Climate Change: A Review of an Emerging Literature*,” *Review of Environmental Economics and Policy*, Vol. 10 (2), pp. 347–362.
- IMF (2008): “*Climate Change and the Global Economy*,” IMF Policy Paper, World Economic Outlook, Chapter 4, April 2008.
- _____ (2017): “*The Effects of Weather Shocks on Economic Activity: How Can Low-Income Countries Cope?*,” World Economic Outlook, Chapter 3, October 2017.
- _____ (2019a) : “*Building Resilience in Developing Countries Vulnerable to Large Natural Disasters*,” IMF Policy Paper.
- _____ (2019b): “*How to Mitigate Climate Change*,” *Fiscal Monitor*, Chapter 2, October 2019
- _____ (2020a): “*Mitigating Climate Change*,” World Economic Outlook, Chapter 3, October 2020.
- _____ (2020b): “*Adapting to Climate Change in Sub-Saharan Africa*,” Regional Economic Outlook for Sub-Saharan Africa, April 2020.
- Klenert, David, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty and Nicholas Stern (2018): “*Making Carbon Pricing Work for Citizens*,” *Nature Climate Change* Vol. 8, pp. 669–677.

Nordhaus, William D (2010): *"Excel file for RICE model as of April 26, 2010,"* Ann Arbor, MI: Interuniversity Consortium for Political and Social Research [distributor], <https://doi.org/10.3886/ICPSR28461.v1>.