

**EXECUTIVE  
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To: Members of the Executive Board

From: The Acting Secretary

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## ADDRESSING GLOBAL CLIMATE CHANGE: THE ROLE OF THE FUND

*The Fund has a role to play in helping its members address those challenges of climate change where fiscal and macroeconomic policies are an important component of the required policy response. The greenhouse gas mitigation pledges submitted by 150 countries ahead of the pivotal Climate Conference in Paris in December represent an important step by the international community towards containing the extent of global warming.*

*Limiting greenhouse gas emissions—a source of negative externalities—is inherently a fiscal issue: carbon pricing, by taxation or similar means, will be critical to meeting the mitigation pledges that countries are now entering into in an efficient and effective way, while also raising substantial revenues that can be used to reduce other, more distorting taxes. Carbon pricing, through its incentive effects, will also help mobilize private finance for mitigation activities and spur the innovation needed to address climate challenges. Finance ministries have a key role to play in promoting and administering these policies and ensuring efficient use of the revenue raised.*

*The process of climate change is set to have a significant economic impact on many countries, with a large number of lower income countries being particularly at risk. Macroeconomic policies will need to be calibrated to accommodate more frequent weather shocks, including by building policy space to respond to shocks; infrastructure will need to be upgraded to enhance economic resilience. It will be important that developing countries seeking to make these adaptations have access to financial support on generous terms.*

*Financial markets will play an important role in helping economic agents and governments in coping with climate change-induced shocks. And heightened climate vulnerabilities and the structural adjustments associated with a shift towards a low-carbon economy over the medium-term will have important implications for financial institutions and financial stability.*

*This paper identifies areas in which the Fund has a contribution to make in supporting its members deal with the macroeconomic challenges of climate change. It draws on materials contained in a forthcoming Staff Discussion Note (Keen et al. 2015) and has benefited from the discussion at an informal Board meeting on IMF work on climate change held on September 30th.*

## 2015- ISSUES FOR THE PARIS COP21

**The international community is coming together at the December 2015 UN Climate Change Conference (COP21) in Paris to lay the foundations for a transition to low-carbon development**

Climate change has potential to do significant economic harm, especially to some of the poorest countries, and poses worrying tail risks.<sup>1</sup> It is a global externality—one country's emissions affect all countries by adding to the stock of heat-warming gases in the earth's atmosphere from which warming arises. So addressing it requires global cooperation.

150 countries have submitted emissions mitigation pledges—'Intended Nationally Determined Contributions', or INDCs—for the Paris conference. If implemented, these commitments will substantially reduce projected future warming, though not by enough to meet the (internationally agreed) 2°C target.<sup>2</sup> At Paris, parties will seek to agree on a legal framework for assessing progress on, and updating, these pledges.

Parties will also discuss climate finance—the advanced countries' pledge to mobilize \$100 billion a year from 2020 onwards, from public and private sources, for climate mitigation and adaptation in developing countries. Flows in 2014 have been estimated at \$62 billion (see below).

Climate Mitigation	
Country/region	Selected Mitigation Pledges Submitted for Paris Summit <sup>a</sup>
China	Lower emissions per unit of GDP 60-65% from 2005 levels by, and achieve peaking of emissions around, 2030
United States	Reduce emissions 26-28% below 2005 levels by 2025.
European Union	Reduce emissions 40% below 1990 levels by 2030.
Russia	Reduce emissions 25-30% below 1990 levels by 2030.
Japan	Reduce emissions 26% below 2013 levels by 2030.
Korea	Reduce emissions 37% below business as usual levels by 2030.
Canada	Reduce emissions by 30% below 2005 levels by 2030.
Mexico	Reduce emissions 22% below business as usual levels by 2030.
Australia	Reduce emissions 26-28% below 2005 levels by 2030

Source. UNFCCC (2015b).

Note. <sup>a</sup>Refers to all greenhouse gases except for China which refers only to carbon dioxide.

<sup>1</sup> Weitzman (2011).

<sup>2</sup> UNFCCC (2015a).

Climate Finance		
Goals for 2020 and beyond	Mobilize from advanced countries \$100 billion per year for climate mitigation and adaptation in developing countries.	
Flows in 2014	\$23.1 billion	Bilateral public finance (e.g., Overseas Development Assistance).
	\$20.4 billion	Multilateral public sources (mostly from Multilateral Development Banks).
	\$16.7 billion	Private finance (co-financing associated with bilateral and multilateral public sources).
	\$1.6 billion	Export credits (mainly for renewable energy).
	\$61.8 billion	Total flows.

Source: OECD (2015).

## NATIONAL ACTION

**Carbon taxes, or tax-like instruments, should be the centerpiece of climate mitigation efforts—but choosing the right instrument, and designing it correctly, are critical for meeting mitigation objectives at lowest cost**

### Choosing Mitigation Instrument

**The success of Paris will hinge critically on carbon dioxide (CO<sub>2</sub>) mitigation in large emitters**

**The key practical issue is what policy instruments are best suited for progress on INDCs and how they should be designed**

**Carbon pricing is preferable to regulation**

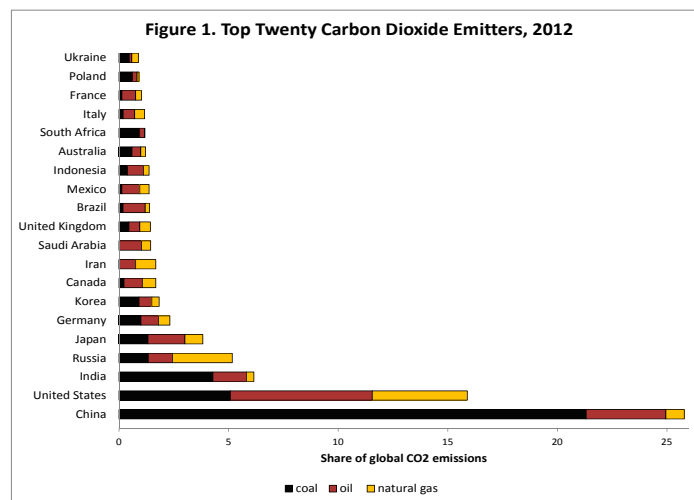
CO<sub>2</sub> emissions from fossil fuel combustion are easier to tax than other greenhouse gases and are by far the largest source of emissions. Twenty countries—including some emerging market economies—account for about 80 percent of global CO<sub>2</sub> emissions (Figure 1).

Policymakers face a wide array of instruments by which to meet commitments to reduce emissions: carbon taxes, emissions trading systems (ETSs), regulations for energy efficiency and renewables, and so on. Choosing the right instrument, and designing it right, is critical for meeting the targets set in INDCs at the lowest overall cost.

Carbon pricing—charging for the carbon content of fossil fuels—is preferable to regulatory approaches to curbing emissions, because it:

- Promotes the full range of mitigation opportunities across all sectors—investments in cleaner fuels and energy efficiency, conserving on the use of vehicles and energy-using equipment, and so on;
- Aligns the private cost of emissions with their true social cost;
- Can raise significant revenue which, if used productively, minimizes overall burdens on the economy; and
- Is simpler, administratively, than multiple regulatory

programs targeting different behavior in different sectors.



Source: IEA (2015).

### **ETSs should look like, and be accompanied by, taxes**

If carbon pricing is implemented through ETSs,<sup>3</sup> these should be structured to look like taxes, by:

- Auctioning allowances to raise revenue; and
- Including price stability measures, such as price floors and ceilings (to create a stable environment for the deployment and development of clean technologies).

ETSs typically focus downstream on industrial emissions and should be accompanied by taxes to cover other significant emissions sources (from transport and residential heating fuels, for instance).

### **Where regulations are retained they should conform to the same design principles as taxes**

If regulatory approaches are used in conjunction with, or in place of, carbon pricing, they should:

- Promote a broad range of mitigation responses (e.g., incentives for reducing the emissions intensity of power generation are more effective than renewable policies as they also encourage switching from coal to gas and from these fuels to nuclear);
- Promote price stability (for example, energy efficiency and emission rate standards can be converted into explicit tax/subsidy schemes with

<sup>3</sup> Under an ETS, firms need an allowance for each ton of their emissions and the government caps total emissions at a target level by restricting the number of allowances. Trading of those allowances sets a market price on emissions

fees for those below, and rebates for those above, a standard);

- Harmonize (explicit or implicit) carbon prices across programs and sectors and align them with environmental objectives.

## Carbon Pricing Design

**Carbon taxes are a practical extension of what most governments do already**

Carbon taxes can be a highly practical extension of road fuel excises, which are widely accepted and well established in most countries and are among the most straightforward of all taxes to administer. Carbon taxes involve building a carbon charge into those excises and extending similar charges to the supply of other petroleum products, coal, and natural gas (perhaps at the point of extraction or refinery gate) with an accompanying system of charges/rebates for imported/exported fuel products.

The administrative and fiscal benefits of carbon taxes over other mitigation instruments may be particularly marked in developing countries where administrative capabilities to monitor ETSs are constrained, the potential market for allowances may be thin, and large informal sectors enhance the fiscal attractiveness of energy taxation relative to broader taxes.

**A transition to greater emissions coverage, with higher prices, is needed**

Currently, about 40 countries are implementing some form of carbon pricing at the national level (counting the EU ETS as 28 countries) and over 20 sub-national governments have carbon pricing schemes.<sup>4</sup> But these schemes cover only about 12 percent of global emissions (though coverage will roughly double when, as it has announced, China introduces pricing on industrial sources in 2017). Prices are typically below \$10 per ton.

**Productive use of revenues is critical for containing the gross costs of carbon pricing**

The revenue at stake from carbon pricing is significant—around 1 percent of GDP or more for large emitters imposing near term carbon prices of \$30 per ton. Efficiently using these revenues produces large economic benefits:

- Revenues can be used to cut broader taxes on labor and capital that distort economic activity and harm growth. Carbon pricing is about more efficient tax systems rather than higher taxes.

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<sup>4</sup> WBG (2015).

- If revenues fund new (environmental or general) spending, this should generate economic efficiency benefits comparable to those from other revenue uses like cutting distortionary taxes.

If revenues are earmarked for low-value spending, or allowances are freely allocated in an ETS, the costs to the economy from carbon pricing are considerably higher.

### **Domestic environmental benefits warrant substantial carbon pricing**

Besides global climate benefits, carbon pricing can generate substantial domestic environmental gains, most importantly fewer air pollution deaths due to less use of coal and other polluting fuels. Domestic environmental benefits would have warranted carbon prices of \$57 per ton of CO<sub>2</sub> in 2010 (averaged across large emitters), even in the absence of global climate benefits.<sup>5</sup> An implication is that countries can have a strong incentive to move forward unilaterally with carbon pricing simply in terms of their own national interest and without reference to the global public bad of climate change. If all large emitters priced carbon in their own interests they would make significant progress on their INDCs, and global emissions would fall by over 10 percent.<sup>6</sup>

### **Impacts on vulnerable households need attention**

Higher energy prices burden households and the impact on the poor is a particular concern. But holding down energy prices is a highly inefficient way to help them, because 90 percent or more of the benefits typically leaks away to higher income groups.<sup>7</sup> Instead, these groups are better helped through targeted measures such as stronger social safety nets, which require only a small fraction of the revenues from carbon pricing. The focus should be on the distributional impact of the whole policy package, not only the component that raises energy prices.

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<sup>5</sup> Parry et al. (2014a).

<sup>6</sup> Parry et al. (2014a).

<sup>7</sup> Clements et al. (2013).



**Another concern is impacts on energy-intensive, trade exposed firms**

Over the longer term, it is better for governments to assist the re-allocation of resources away from carbon-intensive sectors, for example through worker retraining programs, rather than permanently subsidize firms unable to compete when energy is efficiently priced.

Impacts on energy-intensive, trade-exposed firms are nonetheless a particular concern. Border tax adjustments linked to the embodied carbon content of imports can level the playing field and encourage broader country participation in carbon pricing. However, there are significant practical issues (e.g., measuring embodied carbon), legal uncertainties (e.g., compatibility with World Trade Organization obligations), and risks of retaliatory actions.

Significant competitiveness impacts are, however, likely confined to a few industries (e.g., metals, refining, paper, glass, cement) and would be less pronounced with global progress on mitigation.

## **Adaptation and Macroeconomic Policies**

**Role for government policies: overcoming market failures and providing public goods and services to facilitate private sector adjustment**

For many developing countries, growth prospects will be significantly threatened without effective adaptation to climate change. Analysis of adaptation policies must be inherently local and customized to the climate impact on a particular region or sector. It is clear, nonetheless, that developing country governments can face very large adaptation costs: importantly, the need for growth-enhancing scaled up infrastructure provides an opportunity for climate-resilient, low-carbon infrastructure spending. To be successful, the management of this spending, and of financial assistance for it, should be undertaken within a medium-term financial framework consistent with available resources, macro-stability, and debt sustainability.

## **Role of Financial Sectors**

**Monitor and address systemic risks**

Global climate change can entail significant risks to macro-financial stability. Financial and nonfinancial corporate sectors face risks from climate damages and stranded assets (such as coal reserves that become uneconomic with carbon pricing). The disruption could affect corporate balance sheet quality. Some financial regulators and central banks have started thinking about systemic risks related to climate change, but more action is needed at the national level to monitor and address these risks.

**Provide an enabling environment for the financial system to support mitigation and adaptation**

The financial system can play a key role by supporting reductions in climate change risk and mitigating the impact of adverse climate events. Long term institutional investors can help with rebalancing and redistributing of climate related risks and maintaining financial stability. Hedging instruments (e.g., catastrophe bonds, indexed insurance) help insure against increasing natural disaster risk, and other financial instruments (e.g., green stock indices, green bonds, voluntary de-carbonization initiatives) can help re-allocate investment to “green” sectors. Financial sector regulation and supervision should support market development and protect financial stability, while ensuring affordable and sustainable insurability. Stress-testing of climate risks and its macro-financial effects by banks, insurers, and pension funds needs to be developed further.

## FACILITATING GLOBAL PROGRESS

### The potential for price floors and international fuel charges

**Countries need not impose the same emissions price**

Uniformity of carbon prices across countries is not efficient if they have different fiscal needs, different domestic environmental benefits from carbon pricing, or if, on equity grounds, small emitting developing countries have a lesser capacity to pay. Political acceptability of carbon pricing also differs across countries.

**Carbon price floors are the natural analog of other tax coordination regimes**

Underpricing from an international perspective is familiar from situations where countries compete for mobile tax bases, in which context some progress has been made through tax floor agreements (such as for excises on alcohol, tobacco and energy products in the EU). The climate analog would be a coordinated CO<sub>2</sub> price floor among a coalition of willing countries. Such an arrangement, complementary to the process of mitigation pledges, would:

- Recognize the diversity of efficient carbon prices across countries;
- Avoid holding back countries wishing to price emissions more aggressively, for domestic environmental, fiscal, or other reasons;
- Require agreement on just one target (the price floor) rather than multiple emissions targets across countries;
- Involve some monitoring issues (e.g., accounting for special exemptions and changes in broader fiscal provisions affecting energy); these require closer examination, but seem likely to be manageable; and
- Ultimately need incentives to promote broader participation and compliance over time.

**Carbon pricing could scale up climate finance**

Carbon pricing could play a central role in meeting targets for climate finance:

- In developing countries, as an effective way to attract private financial flows for mitigation;
- In developed countries, as a potential source of public funding—a \$30 per ton carbon charge in 2020 would yield about \$25 billion for climate finance (with about 5 percent apportioned).
- A similar amount of revenue could be raised with the same charge applied to international aviation and maritime fuels from advanced countries. These fuels are attractive as a source of climate finance as governments have a weaker claim on the tax base than for domestic fuels. They are also undertaxed from a fiscal and environmental perspective and tax

administration would be straightforward.<sup>8</sup>

## THE FUND'S ROLE

**The Fund is not an environmental organization, but climate change poses significant risks for macroeconomic performance and several of the appropriate policy responses lie within the Fund's expertise**

### **Analytical work provides guidance on policy design**

The IMF draws on the specialist analysis of others (e.g., the Intergovernmental Panel on Climate Change, the International Energy Agency, the World Bank) and focuses on the practical design and administration of fiscal instruments for climate policy and broader energy policy. For example, Fund work has quantified, for over 150 countries, the environmental, fiscal, and economic benefits of energy pricing reform.<sup>9</sup> This information helps policymakers craft the specifics of legislation to meet environmental and fiscal objectives and enlightens stakeholders on the case for reform.

### **Technical assistance, surveillance and training**

The Fund is well positioned to provide technical assistance and training, given its global membership and expertise in fuel tax design, tax administration, and energy price reform. Climate and energy policy developments are sometimes discussed in Article IV consultations, and this seems likely to become increasingly common. Next steps on further integration in surveillance will be informed by assessing experience with selected pilot countries.

<sup>8</sup> Keen et al. (2013). Due to international mobility of the tax base, especially for maritime, globally coordinated charges are needed. Compensation schemes for developing countries should be feasible, however

<sup>9</sup> See Parry et al. (2014b).

**Promoting dialogue**

The Fund collaborates with other international organizations (e.g., World Bank, OECD, and UNEP) to promote policy dialogue among finance ministries, emphasizing the benefits of new revenue from an efficient and easily administered source.

**Integrating natural disaster risks and preparedness strategies in macroeconomic forecasts and debt sustainability analyses**

Low-income and small developing states are especially vulnerable to increasing risks of extreme weather events. Staff, collaborating with other international institutions, will work with countries to develop comprehensive risk management frameworks to assess risks and determine the right mix of building domestic buffers versus risk transfer through insurance or financial market instruments, while tailoring investment and growth policies to building resilience.

**Help countries incorporate adaptation strategies in medium-term budget frameworks**

More analysis of the macroeconomic implications of adaptation policies is needed. Where macro-critical, the fiscal costs of adaptation should be integrated in sustainable medium-term fiscal frameworks.

**Support initiatives to encourage consistent climate-related disclosures, prudential requirements, and stress testing for the financial sector**

Staff work will cover: i) enhancing understanding of the transmission mechanisms from climate risks to financial stability, ii) helping design appropriate disclosure rules for climate risk exposure, iii) technical assistance to promote development of markets and instruments to help manage climate-related risks, iv) developing best practices for stress-testing for climate risks, and v) supporting work on globally consistent prudential requirements for the insurance sector, including on a Global Insurance Capital Standard that allows for catastrophe risk.

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