Desirable design features for carbon pricing instruments

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From the perspective of economic efficiency, desirable design features for carbon pricing schemes include[1]:

- **Comprehensive coverage of emissions**, which can be achieved through implementing pricing in proportion to carbon content on the supply of petroleum products, coal, and natural gas. Alternatively, for some sectors (e.g., electricity) charges can be levied at the point of fuel combustion, though administration may be more involved (and small-scale emitters are often excluded).
- **A uniform price applied to all emissions**, which is appropriate as the damage per ton of emissions is the same, regardless of which fuel they come from or who is using the fuel.
- **Stable and predictable emissions prices**, which promote cost-effectiveness through equating incremental abatement costs at different points in time and help to establish the longer-term signals needed to promote lean technology investments. Provisions to prevent prices declining are also needed to improve compatibility with other mitigation measures (e.g., incentives for renewables).
- **Emissions prices aligned with environmental damages or climate stabilization goals**. Estimates of future climate change damages suggest CO_2 should be priced in the order of $35 per ton[2], though damage assessments are highly contentious. Alternatively, for example, a global CO_2 price starting at about $30 per ton (in current dollars) in 2020 and rising at around 5% a year would be roughly in line with ultimately containing mean projected warming to 2.5°C at least cost[3].
- **Maximizing the fiscal dividend**, which means raising revenues and using the revenues productively, particularly lowering the burden of broader taxes that distort the economy or funding socially desirable (climate-related or other) spending. Failure to exploit the fiscal dividend can undermine the case for carbon pricing over regulatory approaches on cost-effectiveness grounds[4].
- **Carefully targeted compensation schemes for vulnerable households and firms**. Excessive compensation has a high cost in terms of diverting funds from the public budget. With regard to trade-exposed firms, international price floor agreements (analogous to those applied to value added and excise taxes in the EU) provide some protection against losses in competitiveness while allowing individual countries the flexibility to price emissions more aggressively (e.g., due to fiscal and ancillary environmental benefits or green preferences).

In principle, either carbon taxes or emissions trading schemes can meet the above criteria, and in this regard the choice between which type of instrument is less important than getting the design details right of the instrument that is implemented. For example, trading schemes can include allowance auctions to raise revenue and price stability provisions (e.g., price floors where allowances are withdrawn from the market as needed to prevent prices falling below a target level).

On the other hand, a carbon tax can be a more natural extension of existing fuel excises, which are widely accepted and easily administered, without major exemptions (and charges for other environmental damages, most notably air pollution from coal, could be levied at the same time). Moreover, with finance ministries for tax collection, the prospects might be better for using revenues to lower broader taxes on work effort and capital accumulation.

The views expressed herein are those of the authors and should not be attributed to the IMF , its Executive Board, or its Management.

[1]Source: International Monetary Fund, *Fiscal Policy to Mitigate Climate Change: A Guide for Policymakers* (Washington DC, 2012).
[2]Source: United States Inter-Agency Working Group, *Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, 2013.
[3]Source: Nordhaus, W.D., *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World* (New Haven, Connecticut: Yale University Press, 2013).
[4]Source: Parry, I. and Williams, R.C., *Moving US Climate Policy Forward: Are Carbon Tax Shifts the Only Good Alternative?* (Climate Change and Common Sense: Essays in Honor of Tom Schelling, Oxford University Press, 2012).