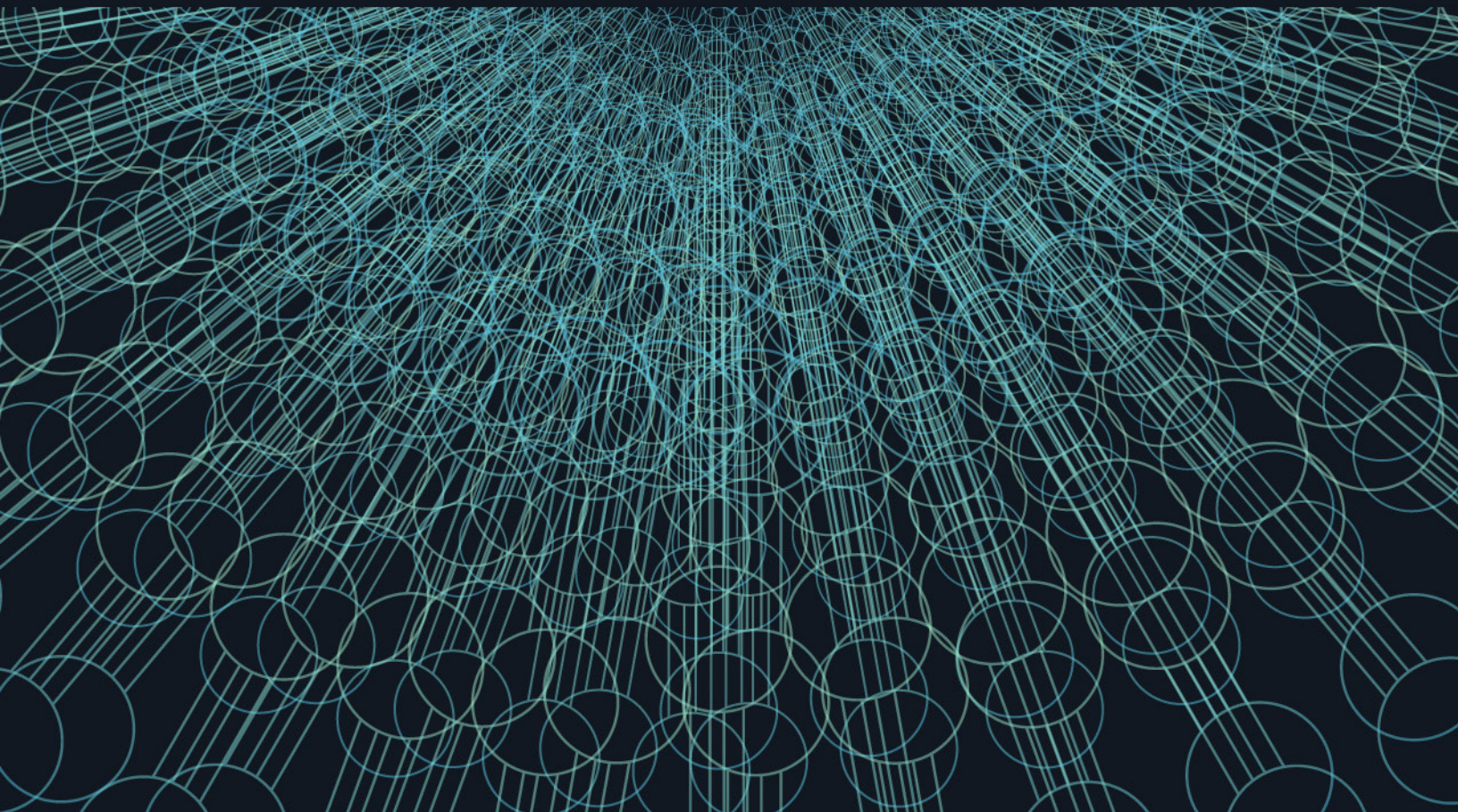


Report of the High-Level Commission on Carbon Prices

Executive Summary





**CARBON PRICING
LEADERSHIP COALITION**

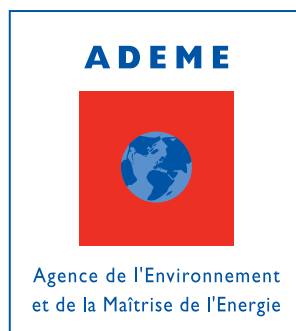
MAY 29, 2017

Report of the High-Level Commission on Carbon Prices

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This booklet contains the overview of the Report of the High Level Commission on Carbon Pricing. A PDF of the final, full-length book is available at <https://www.carbonpricingleadership.org>. Please use the final version of the book for citation, reproduction, and adaptation purposes.



THE COMMISSION: OBJECTIVES

During the 22nd Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Marrakech, Morocco, in 2016, at the invitation of the Co-Chairs of the Carbon Pricing Leadership Coalition (CPLC) High-Level Assembly, Ségolène Royal and Feike Sijbesma, Joseph Stiglitz, Nobel Laureate in Economics, and Lord Nicholas Stern, accepted to chair a new High-Level Commission on Carbon Prices comprising economists, and climate change and energy specialists from all over the world, to help spur successful implementation of the Paris Agreement.

The Commission's objective is to identify indicative corridors of carbon prices that can be used to guide the design of carbon-pricing instruments and other climate policies, regulations, and measures to incentivize bold climate action and stimulate learning and innovation to deliver on the ambition of the Paris Agreement and support the achievement of the Sustainable Development Goals.

Commission Chairs:

Joseph E. Stiglitz

(University Professor,
Columbia University, United States)

Nicholas Stern

(IG Patel Professor of Economics
and Government and Chair of the
Grantham Research Institute, London
School of Economics and Political
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Commission Members:

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(Director of China Carbon Market
Center of Tsinghua University, China)

Ottmar Edenhofer

(Deputy Director and Chief Economist
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Impact Research, Germany)

Gaël Giraud

(Chief Economist of the Agence
Française de Développement, France)

Geoffrey Heal

(Donald C. Waite III Professor of
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Emilio Lèbre la Rovere

(Executive Coordinator of the Center
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Climate and Energy Economics at the
Brookings Institution, United States)

Elisabeth Moyer

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Minister of Trade, Indonesia)

Priyadarshi R. Shukla

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Youba Sokona

(Vice-Chair of the IPCC, Mali)

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(Director, Energy Research Centre,
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Background papers and valuable contributions for this report were provided, in their personal capacity, by Emilie Alberola (I4CE), Richard Baron (OECD), Mark Budolfson (University of Vermont), Sergey Chestnoy (RUSAL), Ian Cochran (I4CE), Lara Dahan (I4CE), Kurt Van Dender (OECD), Francis Dennig (National University of Singapore-Yale College), Subash Dhar (Technical University of Denmark), Simon Dietz (Grantham Research Institute on Climate Change and the Environment), Etienne Espagne (CEPII), Samuel Fankhauser (Grantham Research Institute on Climate Change and the Environment), Maddalena Ferranna (Princeton University), Dominique Finon (CIRED), Marc Fleurbaey (Princeton University), Dinara Gershinkova (RUSAL), Alain Grandjean (Carbon 4), Pierre Guigon (World Bank), Céline Guivarch (CIRED), Cameron Hepburn (University of Oxford and LSE), Christina Hood (IEA), Jean-Charles Hourcade (CIRED), Noah Kaufman (WRI), Thomas Kerr (IFC), Benoît Leguet (I4CE), Mireille Martini (Institut Louis Bachelier), Ajay Mathur (TERI), Amaro Pereira (COPPE/UFRJ), Antonin Pottier (CERNA), Baptiste Perrissin-Fabert (France Stratégie), Grzegorz Peszko (World Bank), Joeri Rogelj (IIASA), Steven Rose (EPRI), Noah Scovronik (Princeton University), Robert Socolow (Princeton University), Dean Spears (Texas University Austin), Andrew Steer and teams at the World Resources Institute (WRI), Jon Strand (IDB), Michael Toman (World Bank), Adrien Vogt-Schilb (IDB), Henri Waisman (IDRRRI) and teams at the Deep Decarbonization Pathways Project, Fabian Wagner (IIASA Vienna), and Byrony Worthington (Environmental Defense Fund Europe). Guidance was provided by multiple reviewers including Richard Baron (OECD), Amar Bhattacharya (Brookings Institution), Carter J. Brandon (World Bank), Marianne Fay (World Bank), Zou Ji (Renmin University of China), and Ian Parry (IMF). The contributions to the Commission are available on www.carbonpricingleadership.org. The Commission also thanks the participants of the meetings held at France Stratégie (Paris, France), in January, and at the Brookings Institution (Washington DC, USA), in April 2017, as well as the participants of the symposium for the Commission, hosted by the Agence Française de Développement, the Chair Energy and Prosperity, and the École Normale Supérieure in Paris on May 17, 2017.

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EXECUTIVE SUMMARY



The purpose of this Commission is to explore explicit carbon-pricing options and levels that would induce the change in behaviors—particularly in those driving the investments in infrastructure, technology, and equipment—needed to deliver on the temperature objective of the Paris Agreement, in a way that fosters economic growth and development, as expressed in the Sustainable Development Goals (SDGs). This report does not focus on the estimation and evaluation of the climate change impacts that would be avoided by reducing carbon emissions. While the Commission also covers other policies relevant and important to carbon-pricing design and delivery on the Paris agreement, its primary focus is on pricing.

This report has been prepared based on the Commission’s assessment of the available evidence and literature as well as on its members’ judgment, developed through their extensive international policy experience. While the commissioners are in broad agreement on the overall thrust of the arguments presented in the report, they may not necessarily support every single assertion and conclusion.

1. Tackling climate change is an urgent and fundamental challenge. At COP21 in Paris, in December 2015, nearly 200 countries agreed to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C.” The goal of stabilizing the temperature increase well under 2°C is largely motivated by concerns over the immense potential scale of economic, social, and ecological damages that could result from the failure to manage climate change effectively. These temperature targets require a large-scale transformation in the structure of economic activity—including a major change in energy systems (especially power generation); industrial processes; space heating and cooling systems; transport and public transportation systems; urban forms; land use (including forests, grasslands, and agricultural land); and the behaviors of households. However, climate policies, if well designed and implemented, are consistent with growth, development, and poverty reduction. The transition to a low-carbon economy is potentially a powerful, attractive, and sustainable growth story, marked by higher resilience, more innovation, more livable cities, robust agriculture, and stronger ecosystems. To succeed, that is, to deliver efficiently and fully realize the potential benefits of climate policies, careful policy design is essential.

2. A well-designed carbon price is an indispensable part of a strategy for reducing emissions in an efficient way. Carbon prices are intended to incentivize the changes needed in investment, production, and consumption patterns, and to induce the kind of technological progress that can bring down future abatement costs. There are different ways to introduce a carbon price. Greenhouse gas

(GHG) emissions can be priced explicitly through a carbon tax or a cap-and-trade system. Carbon pricing can also be implemented by embedding notional prices in, among other things, financial instruments and incentives that foster low-carbon programs and projects. For instance, specific project-based credits, building upon the experience of the Clean Development Mechanism (CDM) of the Kyoto Protocol and on the mechanism established under Article 6 of the Paris Agreement, can provide similar incentives by applying a price to a unit of GHG emissions. Explicit carbon pricing can be usefully complemented by shadow pricing¹ in public sector activities and internal pricing in firms. Reducing fossil fuel subsidies is another essential step toward carbon pricing—in effect, these subsidies are similar to a *negative* emissions price. Governments can enhance the effectiveness of carbon pricing by establishing an enabling environment, building technical and institutional capacity, and establishing an appropriate regulatory framework. As carbon-pricing mechanisms take time to develop, countries should begin doing so immediately.

3. Achieving the Paris objectives will require all countries to implement climate policy packages.

These packages can include policies that complement carbon pricing and tackle market failures other than the GHG externality. These failures are related to knowledge spillovers, learning and R&D, information, capital markets, networks, and unpriced co-benefits of climate action (including reducing pollution and protecting ecosystems). Some countries may conclude that the carbon-pricing trajectories required, if carbon pricing were the sole or dominant instrument, could entail excessive distributional or adjustment costs. Others may conclude that, given the uncertainties, requirements for learning, and scale and urgency of the transformation, rapid and more equitable change could be achieved more efficiently and effectively in other ways. The design of these policies will thus vary and always have to take into account national and local circumstances.

International cooperation—including international support and financial transfers, carbon-price-based agreements, and public guarantees for low-carbon investments—to promote consistency of action across countries can help lower costs, prevent distortions in trade and capital flows, and facilitate the efficient reduction of emissions (as well as the achievement of other Paris Agreement objectives, such as those related to the “financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”).

4. The Commission explored multiple lines of evidence on the level of carbon pricing that would be consistent with achieving the temperature objective of the Paris Agreement, including technological roadmaps, analyses of national mitigation and development pathways, and global integrated assessment models, taking into account the strengths and limitations of these various information sources. Efficient carbon-price trajectories begin with a strong price signal in the present and a credible commitment to maintain prices high enough in the future to deliver the required changes. Relatively high prices today may be more effective in driving the needed changes and may not require large future increases, but they may also impose higher, short-term adjustment

¹Shadow pricing, the assignment of a dollar value to an unpriced commodity in a cost-benefit analysis or an impact assessment.

costs. In the medium to long term, explicit price trajectories may need to be adjusted based on the experience with technology development and the responsiveness to policy. The policy dynamics should be designed to both induce learning and elicit a response to new knowledge and lessons learned. Price adjustment processes should be transparent to reduce the degree of policy uncertainty.

5. Explicit carbon-pricing instruments can raise revenue efficiently because they help overcome a key market failure: the climate externality.

The revenue can be used to foster growth in an equitable way, by returning the revenue as household rebates, supporting poorer sections of the population, managing transitional changes, investing in low-carbon infrastructure, and fostering technological change. Ensuring revenue *neutrality* via transfers and reductions in other taxes could be a policy option. Policy decisions will need to duly take into account the country's objectives and specific circumstances, while keeping in mind the development objectives and commitments agreed in relation to the Paris Agreement objectives.

6. Carbon pricing by itself may not be sufficient to induce change at the pace and on the scale required for the Paris target to be met, and may need to be complemented by other well-designed policies tackling various market and government failures, as well as other imperfections.

A combination of policies is likely to be more dynamically efficient and attractive than a single policy. These policies could include investing in public transportation infrastructure and urban planning; laying the groundwork for renewable-based power generation; introducing or raising efficiency standards, adapting city design, and land and forest management; investing in relevant R&D initiatives; and developing financial devices to reduce the risk-weighted capital costs of low-carbon technologies and projects. Adopting other cost-effective policies can mean that a given emission reduction may be induced with lower carbon prices than if those policies were absent.

Conclusion


Countries may choose different instruments to implement their climate policies, depending on national and local circumstances and on the support they receive. Based on industry and policy experience, and the literature reviewed, duly considering the respective strengths and limitations of these information sources, this Commission concludes that the explicit carbon-price level consistent with achieving the Paris temperature target is at least US\$40–80/tCO₂ by 2020 and US\$50–100/tCO₂ by 2030, provided a supportive policy environment is in place.

The implementation of carbon pricing would need to take into account the non-climate benefits of carbon pricing (such as the use of revenues derived from it), the local context, and the political economy (including the policy environment, adjustment costs, distributional impacts, and political and social acceptability of the carbon price). Depending on other particular policies implemented, a carbon price could have powerful co-benefits that go beyond climate, for instance, potential improvements in air pollution and congestion, the health of ecosystems, access to modern energy, and so on. Further,

in a realistic context where domestic and international compensatory transfers are limited, imperfect, and costly, it is impossible to disregard distributional and ethical considerations when designing climate policies. In view of this, the appropriate carbon-price levels will vary across countries. In lower-income countries they may actually be lower than the ranges proposed here, partly because complementary actions may be less costly and the distributional and ethical issues may be more complex.

It is of vital importance to the effectiveness of climate policy, particularly carbon pricing, that future paths and policies be clear and credible. New data will emerge continually and new knowledge be generated, and these facts and lessons learned should be taken into account—indeed, carbon pricing should foster learning and technological progress. It will be important to monitor and regularly review the evolution of emissions, technological costs, and the pace of technological change and diffusion so that carbon prices can be adjusted, particularly upward, if actual prices fail to trigger the required changes. Policy adjustments should be made based on criteria that are transparent and sound: policies should be “predictably flexible.” It is desirable that the carbon-price range across countries narrow over the long term, in a time frame that depends on several factors, including the extent of international support and financial transfers, and the degree of convergence in living standards across countries.

The temperature objective of the Paris Agreement is also achievable with lower near-term carbon prices than indicated above if needed to facilitate transitions; doing so would require stronger action through other policies and instruments and/or higher carbon prices later, and may increase the aggregate cost of the transition. The carbon pricing and complementarity measures indicated here are substantially stronger than those in place at present (85 percent of global emissions are currently not priced, and about three quarters of the emissions that are covered by a carbon price are priced below US\$10/tCO₂). This statement is consistent with the observation that the Nationally Determined Contributions (NDCs) for 2030 associated with the Paris Agreement represent emission reductions that are substantially smaller than those necessary for achieving the Paris target of “well below 2°C.”



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