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Toward a Comprehensive Approach to Climate Policy, Sustainable Infrastructure and Finance

Céline Bak, Amar Bhattacharya, Ottmar Edenhofer and Brigitte Knopf

Key Points

- The Paris Agreement and countries' nationally determined contributions (NDCs) represent important commitments to climate action; however, a collective plan to keep the global temperature increase to well below 2°C has not been reached and the world risks being caught in a cycle of low and uneven growth.
- An integrated policy package incorporating the scaling up of low-carbon and climate-resilient infrastructure, sustainable finance and carbon pricing could address concerns about the potentially adverse impact of some climate policies on development prospects and economic growth, while simultaneously achieving the objectives of the Paris Agreement and the United Nations (UN) Sustainable Development Goals (SDGs).
- Phasing out fossil fuel subsidies and putting a price on carbon will harness the transformative power of the market and stimulate low-carbon investment.

Challenge

The Intergovernmental Panel on Climate Change (IPCC) established the scientific foundation of a global consensus that human-made climate change poses a very severe threat to development and inclusive growth in the medium and long term. The Group of Twenty (G20) countries are responsible for roughly 80 percent of global energy use and carbon dioxide (CO_2) emissions, and are thus heavyweight players in climate policy. There are, however, concerns about the distributional effects of some climate policies in combating climate change, and their potentially adverse impact on development prospects and economic growth. These concerns can be resolved through an integrated policy package incorporating the scaling up of low-carbon and climate-resilient infrastructure, sustainable finance and carbon pricing.

Despite the collective ambitions that yielded the landmark Paris Agreement, and despite the enhanced commitments to climate action by individual countries embodied in their NDCs, the world is still far from achieving a collective plan to keep the global temperature increase to well below 2°C. The world is also at risk of being caught in a cycle of low and uneven growth and, with it, of failing to reach the UN SDGs to eliminate poverty and provide a better life for all. Unlocking the impediments to the scaling up of sustainable infrastructure can help to meet all three challenges by laying the foundations for strong

About the Authors

Céline Bak is a CIGI senior fellow with the Global Economy Program. At CIGI, she serves as the co-chair of the Think Tank 20 (T20) taskforce on climate policy and finance. This taskforce will feed into the G20 Secretariat under the German presidency on carbon pricing, sustainable infrastructure and sustainable finance. In her capacity as an innovation practitioner, Céline sits as a director of Emissions Reduction Alberta, Green Centre Canada and chairs the Core Evaluation Team for Genome Canada's Genomic Applications Partnership Program. Through her role as president of Analytica Advisors, Céline provides strategic vision for clean technology industry leaders. As an expert on innovation and the low-carbon economy, Céline has appeared on five occasions as a witness before Parliament, and is frequently sought out by major Canadian media outlets to discuss sustainable finance, climate change and the low-carbon economy in Canada. Within Global Affairs Canada, she was the chair of the Private Sector Advisory Group and served as the senior industry advisor — sustainable technologies. Céline holds an MBA from the University of Bath and a bachelor of commerce degree from the University of Guelph.

Amar Bhattacharya is a senior fellow at the Global Economy and Development Program at the Brookings Institution. His focus areas are the global economy, development finance, global governance, and the links between climate and development. From April 2007 until September 2014 he was director of the Group of Twenty-Four (G24), an intergovernmental group of developing country finance ministers and central bank governors. Prior to taking up his position with the G24, Amar had a long-standing career in the World Bank. His last position was as senior advisor and head of the International Policy and Partnership Group. He completed his undergraduate studies at the University of Delhi and Brandeis University and his graduate education at Princeton University.

Ottmar Edenhofer is director of the Mercator Research Institute on Global Commons and Climate Change (MCC), founded jointly by Stiftung Mercator and the Potsdam Institute for Climate Impact Research (PIK). He is professor of the economics of climate change at the Technische Universität Berlin and deputy director, as well as chief economist, at the PIK. From 2008 to 2015, he served as co-chair of Working Group III of the Intergovernmental Panel on Climate Change, which won the Nobel Peace Prize in 2007. He studied economics and philosophy at the University of Munich and holds a diploma in economics from Ludwig-Maximilians-Universität Munich (Prädikatsexamen) and a B.A. in philosophy (*summa cum laude*) from the Munich School of Philosophy (Hochschule für Philosophie). In addition to his teaching and research, he is actively involved in public policy and in the public debate in Germany and at the EU level.

Brigitte Knopf is secretary general of MCC. She is responsible for the management and strategy of MCC; cooperation with universities and stakeholders from government, business and civil society; and German and European energy and climate policy (Energiewende). Her recent work focuses on the implementation of the Paris Agreement. In the context of the G20 process, she develops strategies on how carbon pricing could support not only climate change mitigation, but also finance the UN SDGs. Before joining MCC in 2015, she was deputy head of the research domain Sustainable Solutions at the PIK and head of the group Energy Strategies Europe and Germany. She holds a Ph.D. in physics. In 2014, she coordinated the Euro-CASE assessment of the EU emissions trading scheme. Brigitte is the author of several publications in scientific journals and is actively involved in the public debate in Germany and at the EU level with presentations and media interviews.

and inclusive growth; by providing access to energy, mobility, education and health; and by accelerating the decarbonization of our economies.

This policy brief proposes a comprehensive approach that links inclusive growth, sustainable development and climate goals. It builds on a sustainable infrastructure with three key pillars: strengthening and reorienting investment strategies to exploit the significant opportunities of low-carbon, climate-resilient infrastructure; transforming finance to enable and drive change; and phasing out fossil fuel subsidies and putting a price on carbon to harness the transformative power of the market and stimulate low-carbon investment.[1]

Proposals

Strengthening and Reorienting Investment Strategies

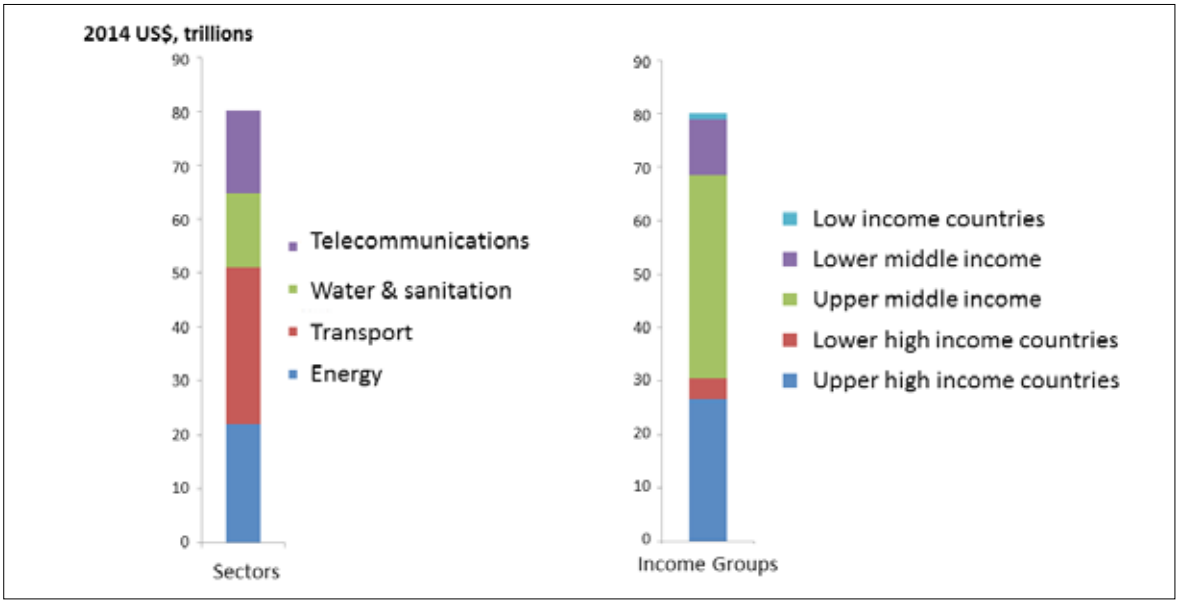
Investment needs for sustainable infrastructure over the next two decades represent a once-in-a-lifetime transition. Rapidly scaling up low-carbon and climate-resilient infrastructure is key to sustainable development and inclusive economic growth and to meeting the climate goals. The investment in infrastructure required for energy, transport, potable water supply and sanitation, as well as telecommunications over the next 15 years is estimated to be around US$80–$90 trillion (see Figure 1), which exceeds the value of the entire existing stock. These demands are driven by aging infrastructure in advanced economies and high demand for new infrastructure in emerging markets and developing countries. New infrastructure demands are growing rapidly because of problems in access to water, sanitation or electricity, rising incomes and deep structural changes, in particular rapid urbanization. Smart infrastructure choices can contribute to human development in line with environmental targets, whereas making the wrong choices now will result in a lock-in of unsustainable patterns for several decades (see Figure 2 for the example of coal-powered plants) and potentially stranded assets (Röhrkasten et al. 2016).

Because of a shrinking global carbon budget, increasing climate risks and long-lived infrastructure assets, the window for making the right choices is narrow. To keep the global temperature increase to less than 2°C with a "likely" chance, the emission of carbon into the atmosphere needs to be limited to roughly 800 gigatons of CO_2 ($GtCO_2$). However, the pledged NDCs would consume 75 percent of the total carbon budget by 2030 (see Figure 2). Delays will also increase the cost of future remedial measures and raise the likelihood of catastrophic risks. This underlines the urgency of the problem and the need for stronger action. Building better, smarter and more sustainable infrastructure will allow countries to leverage innovation and continuously strengthen their NDCs in the next decade as required by the Paris Agreement (Bak 2016). In addition, making investments in low-carbon and climate-resilient infrastructure today will ensure that decarbonization of the global economy by 2050 remains possible; it avoids locking in high-carbon investments and gives policy makers leeway to agree to ambitious targets in the future. In addition, sustainable infrastructure investments can help countries to better prepare for future climate impacts.

Investments in sustainable infrastructure are being held back by an array of impediments that will need to be tackled. Investing in sustainable infrastructure is inherently complex because of externalities (positive and negative) and very long-term horizons. Most countries lack the necessary policy and institutional foundations, including long-term planning capacity (at the national, local and municipal levels) with a focus on sustainability from the outset; the ability to transform plans into bankable and sustainable projects that internalize positive and negative externalities over the life of the infrastructure; an enabling environment to attract the private sector, including effective public-private partnership frameworks; institutional arrangements to underwrite policy and funding risks; overcoming the bias toward incumbent and less sustainable solutions; and the capacity to plan, build and

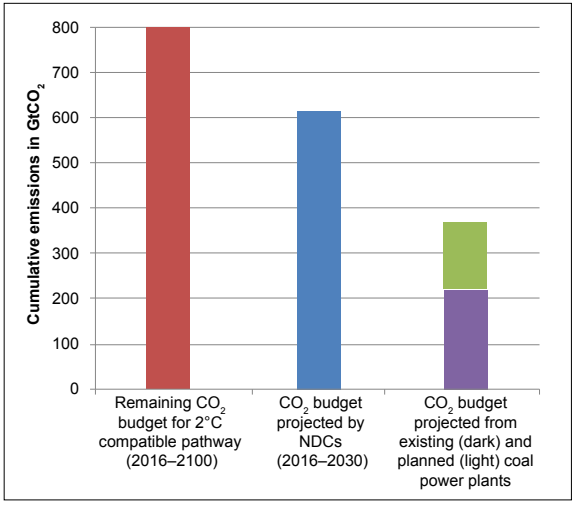
1 This policy brief is a joint product by all members of the T20 Climate Policy and Finance task force (see Appendix) and draws on joint discussions at the workshops held on March 12, 2016, and February 28, 2017. It is lead authored by the co-chairs (Céline Bak, Amar Bhattacharya and Ottmar Edenhofer) and the coordinator (Brigitte Knopf) of the task force. It benefited considerably from input by Jan Steckel, Michael Jakob, Olivier Bois von Kursk and Gregor Schwerhoff, from the MCC. The authors' analysis is based on peer-reviewed literature, as given in the Works Cited. The recommendations are based on the evidence from this literature, but are the personal opinions of the authors.

Figure 1: Cumulative Global Infrastructure Investments Required by Sector and Country Income Groups, 2014–2030



Source: Bhattacharya et al. (2016).

Figure 2: Global CO_2 Emissions Remaining to Keep below 2°C Rise in Temperatures versus Projected Carbon Emissions by NDCs and from Existing and Planned Coal Power Plants



Source: Edenhofer, Flachsland and Kornek (2016).
Note: The budget for 2°C refers to cumulative CO_2 emissions consistent with limiting warming to less than 2°C with a "likely" chance (66 percent probability), see IPCC (2014) for the qualification of uncertainties.

commission projects efficiently. As a result, there is insufficient infrastructure investment and the investment that is being made is not as smart, resilient and sustainable as it should be.

Policy Proposals for the G20

→ G20 countries should include targets on the quantity and quality of sustainable infrastructure consistent with the SDGs and a 2°C compatible pathway within their NDCs, and should recognize infrastructure and investment needs in their long-term climate strategies.

→ To support these targets, G20 countries should undertake systematic assessments of current investments and future plans and of the impediments to sustainable infrastructure. Based on these assessments, the G20 should set out concrete proposals for national and collective actions to scale up investments and accelerate the shift to low-carbon, climate-resilient infrastructure.

→ The G20 should invite the Multilateral Development Banks (MDBs) working in cooperation with other international organizations (Organisation for Economic Co-operation and Development [OECD], International Monetary Fund, the International

Renewable Energy Agency, International Energy Agency and the International Energy Forum, and the G20 Infrastructure Hub) and private entities to establish common definitions and standards for sustainable infrastructure that can be used to shape both public and private investments in infrastructure to deliver on a 2°C compatible pathway and the SDGs.

Transforming Finance to Enable and Drive Change

The scale of investment requirements for sustainable infrastructure calls for a strengthening of finance from all sources and a reorientation toward green and clean infrastructure, because access to long-term and affordable finance is a major barrier to the scaling up of investments in sustainable infrastructure. Given growing limitations on fiscal space in many countries, stronger efforts are warranted on public resource mobilization, including, as discussed below, the phasing out of fossil fuel subsidies and the adoption of carbon pricing. It will also be necessary to strengthen fiscal capacities at a local level since a large proportion of infrastructure spending will be on urban areas. This will require local governments to access their own sources of revenue and for intergovernmental fiscal relations to give a greater role to cities and local governments.

In order to unlock the capital needed for sustainable infrastructure, policies that leverage the strengths of both the public and private sectors are needed, with the bulk of the financing being generated by the private sector. There are large pools of domestic and global savings that are not currently tapped for green investments. This includes infrastructure. Macroeconomic risks and weaknesses in governance are an impediment to private sector involvement; transforming finance to enable and drive change will require more engagement from the public sector.

The most important impediment to unlocking private sector pools of capital for infrastructure is uncertainty over the reliability of revenues for a given project. Three funding sources can be employed to make sustainable infrastructure projects viable and thereby mobilize private sector green finance: user fees levied on citizens; availability payments from governments, financed by general or earmarked tax revenues; and land-value capture levied on project developers. How these funding sources are combined must reflect the ability of users to pay in the short term, the projected useful life of the infrastructure and the timing of spillover benefits generated by the project. Greater clarity and certainty on how these funding sources will be combined is essential to mobilizing private finance on a large scale.

In addition to contributing to revenue streams to make projects viable, governments themselves may address certain risks. First, governments can reduce regulatory risks through legislative frameworks for carbon pricing, as detailed below, and other regulations to support the achievement of the NDCs. Second, MDBs and public infrastructure banks can provide guarantees for loan tenure risk as well as project-related performance risk for innovative infrastructure solutions. Finally, governments may establish public-private partnerships (PPPs) if they prove to return value for money through strong side-by-side tests to guard against uneconomical PPP arrangements.

MDBs and national development banks have a special role in supporting infrastructure in emerging markets and developing countries, from the policies and institutions that can translate promising ideas into real demand, all the way through to finance at a manageable cost of capital and the effective management of risk. The MDBs and national development banks are absolutely vital in the early stages of these projects to get over the policy and institutional issues and the most difficult of the risks. If these stages are well-managed, large private sector funds can come in.

As part of creating markets to finance sustainable infrastructure and scaled-up deployment of innovation, harmonization of the disclosure of climate-related financial risk throughout the financial system will stimulate a shift of global capital and anchor climate resilience in the global financial system.[2] Information asymmetries related to climate risk make it difficult for investors to assess the physical, regulatory and legal risks of climate change. Today, reporting is voluntary and varies across industries and countries. Mandatory climate-related financial disclosure will guard against the risks of tipping points and contribute to financial stability.[3] These must address three levels of climate-related financial disclosure: how

2 See Verdolini et al. (2017).

3 See Berensmann et al. (2017).

investments contribute to climate change, including the emissions from investment portfolios and low-carbon investments; how climate change will affect the resilience of investments, including transition risks and physical risks; and what climate scenario and emissions assumptions are used to assess the climate resilience of investments. For example, only five percent of the world's 500 largest institutional investors have policies in place to actively monitor the risk of stranded assets with their investment managers (Bouvet, Kirjanas and Sheppard 2016).

Finally, sustainable finance must also be congruent with climate finance as committed under the Paris Agreement. Official development assistance and climate finance remain critical especially for low-income and vulnerable countries, and can be used to catalyze investments in sustainable infrastructure even in middle-income countries. It is important, therefore, that rich countries live up to their commitments, including those made under the Paris Agreement.

Generally accepted standards and definitions of "green finance"[4] are crucial to attract investors in sustainable infrastructure. Standardization contributes to building comparable capital markets for investment in sustainable infrastructure across borders and to prevent "green washing."[5] In addition, climate-related financial transparency is needed in all parts of the financial system, including banks, capital markets, institutional investors, private equity managers, insurers, public finance institutions and regulation. Today, even for the institutional investors with the most advanced disclosure policies, only 3.4 percent of their assets represent low-carbon investments (Bouvet, Kirjanas and Sheppard 2016). This needs to rise significantly if sustainable infrastructure investments are to be scaled up.

Policies implemented to assure financial system stability must also be considered in light of climate risks to the financial system. Financial market regulation may impede green finance through investment limits, capital adequacy, reserve requirements, the valuation of assets and liabilities and limits on foreign investment. These can discourage longer-term investment and cross-border investments in sustainable infrastructure as well as in emerging innovations. The effect of these regulations can be tempered by allowing preferential capital and equity for sustainable investments. Moreover, platforms encouraging the collaboration among the private sector, regulators, central banks and academics to establish consistent frameworks and definitions across sectors and countries would facilitate the move from voluntary to mandatory disclosure.

The information asymmetries that exist for climate-related financial risk also interfere with projects based on innovative solutions to climate change. These may occur in many areas, including, for example, transportation, energy efficiency, renewable energy storage and methane abatement. In order to accelerate the climate and economic spillover benefits of public investment in innovation, sustainable finance policies must also address the broadening and deepening of markets for investment in low-carbon innovation. This can be achieved by disclosure of the positive impact that investments in these projects have on climate-related financial risk (Bak 2017; see also Verdolini et al. 2017).

Policy Proposals for the G20

- → Building on the commitments made at the Hangzhou summit, the G20 should ask MDBs to set a system-wide target for supporting the scaling-up of sustainable infrastructure consistent with the ambitions of the SDGs and the Paris Agreement. In turn, G20 shareholders should commit to provide MDBs with the resources and flexibility needed to raise their collective ambitions.

- → The G20 should invite the Financial Stability Board to establish a platform to exchange experiences and develop approaches to disclosure on climate-related financial risks (transition, physical and litigation). This platform should be chaired by finance ministries / central banks and involve all relevant stakeholders, including regulators, academia, finance, industry and relevant international institutions. The proposed platform should develop mandatory climate-related financial risk disclosure as well as its corollary, the potential for risk reduction

4 Green finance can be understood as the financing of investments that provide environmental benefits in the broader context of environmentally sustainable development (G20 Green Finance Study Group 2016). It was brought forward in the G20 context during the Chinese presidency in 2016.

5 See Berensmann et al. (2017).

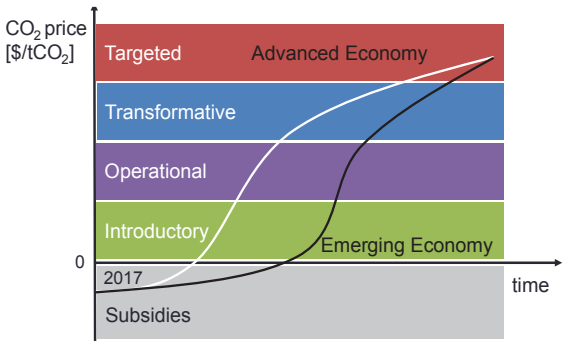
from investment in sustainable infrastructure and in climate-related innovation projects. In addition, the platform should develop model legislation for financial disclosure and the standardization of green finance practices, for both private sector and state-owned companies consistent with the Paris Agreement and SDGs.

→ The link between green finance and carbon pricing should be fostered: development banks and private sector financial institutions should be encouraged to adopt shadow carbon pricing in internal decision making as an instrument to help reduce climate-related risk in their investment portfolios. Implicit and explicit carbon pricing should be introduced as an indicator to improve the transparency of green indicators and make green finance more traceable.[6] G20 governments should also use their leverage to institute shadow carbon pricing throughout MDBs and (semi-)public national banks.

Leveraging Market Forces to Stem Climate Change – by Setting Prices Right

The current price system for carbon favours investment in high-carbon infrastructure for two reasons: fossil fuel subsidies create a perverse incentive for carbon-intensive investments; and there is no price on polluting the atmosphere to steer investments in the right direction. At the global level, every ton of CO_2 is subsidized by an average US$150 (including negative externalities such as health effects by air pollution) (Coady et al. 2015) as a consequence of preferential fiscal treatment of carbon industries. By contrast, only 13 percent of global emissions are subject to carbon pricing and the price levels are often low (World Bank, Ecofys and Vivid Economics 2016). This incentive structure favours investments in high-carbon infrastructure and disincentivizes low-carbon investments. The renaissance of coal, driven, in particular, by poor but fast-growing countries, is one consequence of this perverse incentive structure (Steckel, Edenhofer and Jakob 2015; Edenhofer 2015). A transition toward low-carbon, climate-resilient infrastructure requires both the phasing out of inefficient fiscal policies on the one hand and implementing carbon pricing on the other. As a first step, countries can implement carbon pricing schemes at the domestic level, with rising national carbon price plans, depending on whether they are a developed or an emerging economy. They can then converge on a carbon price in the long term (see Figure 3).

Figure 3: Targeted Carbon Price for a 2°C Compatible Pathway for Emerging and Developed Economies (Qualitative Representation)



Source: Based on Carbon Disclosure Project (2015), authors' own representation.

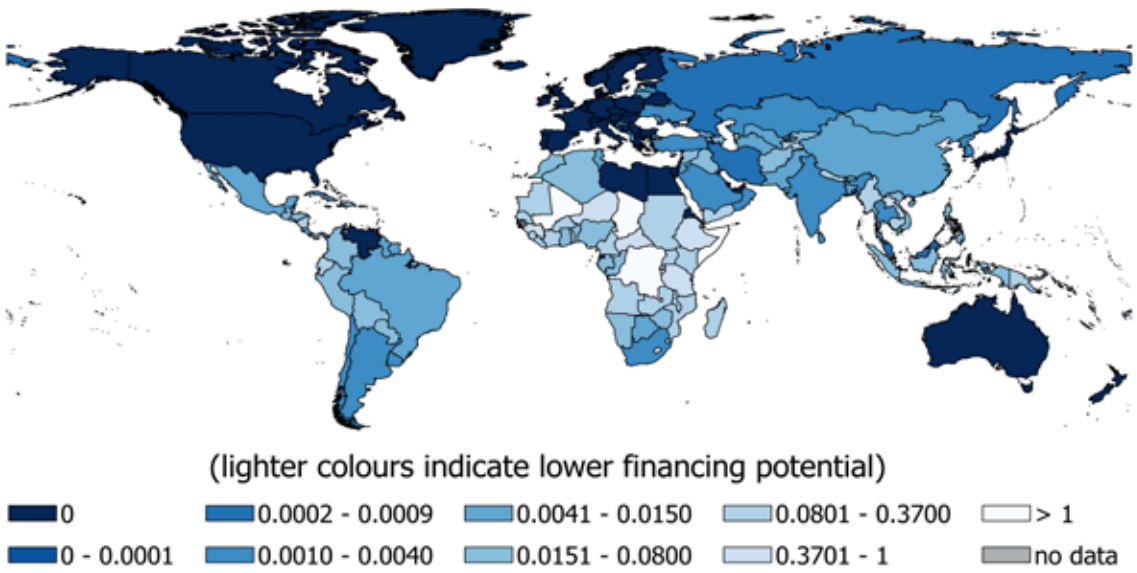
Administrative and political barriers to carbon pricing can be turned into opportunities. Carbon pricing is often perceived to lead to regressive distributional effects and hence to place a greater burden on the poor. While such effects are highly country specific, and in some cases carbon pricing might actually be progressive, potential negative effects for the poor can be addressed through complementary policies.[7] For example, Indonesia succeeded in compensating poor households while reforming its fossil fuel subsidy schemes. Complementing fossil fuel subsidy phaseout and carbon pricing with support for wider public goods such as health, education, clean energy and public transport has also proven to increase public support (Whitley and van der Burg 2015).

In addition to providing the right incentives for climate change mitigation, getting carbon prices right also generates significant public revenues. These revenues can be used to finance sustainable infrastructure in various ways. First, in most countries, revenues from national carbon pricing schemes, in line with limiting global temperature increase to well below 2°C, would be sufficient to provide universal access to key infrastructure

6 Ibid.

7 See Nguyen et al. (2017).

Figure 4: Share of Carbon Revenues Needed to Provide Universal Access to Water



Source: Jakob et al. (2016).

Note: Share is measured by the ratio of costs of closing the infrastructure gap over carbon revenues. A ratio exceeding 1 (white) implies that carbon revenues are not sufficient to cover the cost of closing the gap. The darker the colour shading, the lower the share of carbon revenues needed to finance universal access. The darkest shade includes countries that are already close to or have universal access.

services and thus help to achieve SDGs (Jakob et al. 2016) (see Figure 4). Second, carbon pricing may be a lever to increase the economic efficiency of the tax system, especially in economies with large informal sectors, as evading taxes on fossil fuels is less likely than evading sales or income taxes (Franks, Edenhofer and Lessmann 2015). By substituting income or value-added taxes with green fiscal reforms, adverse effects on the poorest members of society can be avoided. Third, carbon pricing revenues can also provide funds for green industrial policies, for example, to pay emerging firms with climate change solutions for greenhouse gas (GHG) reductions as a bridge to a meaningful price on carbon. Finally, revenues from carbon pricing could serve as a means to ramp up domestic resource mobilization, which is one of the main goals stated in the Addis Ababa Action Agenda. Climate finance can play an important role in supporting such national carbon pricing efforts (Steckel et al. 2017).

Policy makers must be equipped with the same quality of information on the low-carbon economy as is available for today's economy. Implementing monitoring systems to track steps toward a low-carbon economy will ensure the same quality of economic information that already exists for incumbent fossil fuel sectors (Bak 2015). G20 members must implement long-term low-GHG-emission and climate-resilient development strategies, in accordance with article 4 of the Paris Agreement, supplemented by reliable metrics to track progress.[8] To determine whether developments are in line with stated targets, they should be made subject to regular rounds of peer review, as is already common practice in numerous international fora.

8 See Löschel and Großkurth (2017).

Policy Proposals for the G20

- Assess the adequacy of carbon prices: The G20 finance ministers should commit to a peer review process to assess the adequacy of the current carbon-pricing systems to deliver the NDCs under the Paris Agreement.
- Phase out fossil fuel subsidies: The G20 has pledged, every year since 2009, to phase out fossil fuel subsidies, but has not set a specific deadline to do so. The authors suggest that the G20 members should now set 2022 as a target date for eliminating fossil fuel subsidies, including both production and consumption subsidies. This should be accompanied by redirecting the savings to the groups most affected by the reform. In addition, all G20 members should complete their fossil fuel subsidy peer reviews by 2018.
- Develop a carbon pricing road map: A permanent platform for cooperation on carbon pricing within the G20 should be established with the aim of developing a road map to implement carbon pricing that would double the level of emissions covered by carbon pricing mechanisms from current levels of about 17 percent within the G20 to 35 percent by 2020, and doubling it again within the following decade; agree on a minimum carbon price that should grow over time to become transformative; underpin bilateral endeavour and mutual peer review of carbon pricing systems; and price carbon broadly, while maintaining social equity and increasing access to sustainable infrastructure, to ensure a just transition toward a low-carbon economy.

Author's Note

This policy brief was originally published as a T20 Insight Brief, in connection with the 2017 G20 stakeholder consultation process organized by the German presidency. The original brief, which appeared under the title "Towards a comprehensive approach to climate policy, sustainable infrastructure, and finance," may be accessed on the G20 Insights website at www.g20-insights.org/policy_briefs/towards-comprehensive-approach-climate-policy-sustainable-infrastructure-finance/.

Acronyms and Abbreviations

CO_2	carbon dioxide
G20	Group of Twenty
GHG	greenhouse gas
$GtCO_2$	gigatons of CO_2
IPCC	Intergovernmental Panel on Climate Change
MCC	Mercator Research Institute on Global Commons and Climate Change
MDBs	Multilateral Development Banks
NDCs	nationally determined contributions
SDGs	Sustainable Development Goals
OECD	Organisation for Economic Co-operation and Development
PPPs	public-private partnerships
UN	United Nations

Appendix

Existing Agreements

- The Paris Agreement
- United Nations 2030 Agenda for Sustainable Development
- Addis Ababa Action Agenda
- G20 Leaders' Communiqué, Hangzhou summit

Existing Policies and Monitoring

- Addis Ababa Action Agenda
- Financial Stability Board
- Financial Stability Board — Taskforce on Climate-related Financial Disclosures Report
- MDBs
- Global Infrastructure Hub
- Global Infrastructure Facility
- Mission Innovation
- Renewable Energy Platform for Institutional Investors
- The Carbon Disclosure Project (CDP)
- NDC Partnership
- 2050 Pathways Platform

Members of the Climate Policy and Finance Task Force

Alan S. Alexandroff, Munk School of Global Affairs, University of Toronto, Canada

Venkatachalam Anbumozhi, Economic Research Institute for ASEAN and East Asia, Indonesia

Daniel Argyropoulos, Agora Energiewende, Germany

Céline Bak, CIGI, Canada

Steffen Bauer, German Development Institute (DIE), Germany

Kathrin Berensmann, DIE, Germany

Amar Bhattacharya, Brookings Institution, United States

Ralph Bodle, Ecologic, Germany

Olivier Bois von Kursk, MCC, Germany

Kerstin Burghaus, MCC, Germany

Wil Burns, CIGI, Canada

Ben Caldecott, Smith School of Enterprise and the Environment, University of Oxford, United Kingdom

Carlo Carraro, International Center for Climate Governance, Italy

Elie Chachoua, Climate Action Network-International, France

Romy Chevallier, South African Institute of International Affairs, South Africa

Neil Craik, CIGI, Canada

Ira Dorband, MCC, Germany

Susanne Dräger, CDP, Germany

Susanne Dröge, Stiftung Wissenschaft und Politik, Germany

Ottmar Edenhofer, MCC, Germany

Christian Egenhofer, Centre for Euopean Policy Studies, Belgium

Jasper Eitze, Konrad-Adenauer-Stiftung, Germany

Sam Fankhauser, Grantham Research Institute on Climate Change and the Environment, United Kingdom

Manfred Fischedick, Wuppertal Institut für Klima, Umwelt, Energie (WI), Germany

Oonagh Fitzgerald, CIGI, Canada

Andrés Flores, Centro Mario Molina, Mexico

Philipp Grosskurth, RWI — Leibniz Institute for Economic Research, Germany

Gerrit Hansen, Germanwatch, Germany

Thomas Heller, Climate Policy Initiative, United States

Ingrid Holmes, E3G, United Kingdom

Yu Hongyuan, Shanghai Institutes for International Studies (SIIS), China

Michael Jakob, MCC, Germany

Ye Jiang, SIIS, China

Frank Jotzo, Australian National University, Australia

Christian Kastrop, OECD, Germany

John Kirton, Munk School of Global Affairs, University of Toronto, Canada

Brigitte Knopf, MCC, Germany

Madeline Koch, Munk School of Global Affairs, University of Toronto, Canada

R. Andreas Kraemer, Ecologic Institute, Germany; CIGI

Mónica Lafon, Centro Mario Molina, Mexico

Gabriel Lanfranchi, Center for the Implementation of Public Policies Promoting Equity and Growth (CIPPEC), Argentina

Garth le Pere, University of Pretoria, South Africa

Gerd Leipold, Humboldt-Viadrina Governance Platform; Climate Transparency, Germany

Wonhyuk Lim, Korea Development Institute School of Public Policy, Korea

Domenico Lombardi, CIGI, Canada

Andreas Löschel, University of Münster, Germany

Melissa Low, National University of Singapore, Singapore

Lawrence MacDonald, World Resources Institute, United States

Gustavo Martinez, Council for International Relations (CARI), Argentina

Sylvie Matelly, Institut de Relations Internationales et Stratégiques (IRIS), France

Mercedes Méndez Ribas, CIPPEC, Argentina

Nils Meyer-Ohlendorf, Ecologic Institute, Germany

Cao Mingdi, Renmin University of China (RDCY), China

Susanna Mocker, Agora Energiewende, Germany

Leif Moestue, CIPPEC, Argentina

Shingi Mutanga, Human Sciences Research Council, South Africa

Hermann Ott, WI, Germany

Jyoti Parikh, Integrated Research and Action for Development, India

Anna Pegels, DIE, Germany

Sonja Peterson, Kiel Institute for the World Economy, Germany

Kamleshan Pillay, BRICS Research Centre, South Africa

Yang Qingqing, RDCY, China

Rainer Quitzow, Institute for Advanced Sustainability Studies (IASS), Germany

Sybille Röhrkasten, IASS, Germany

Joël Ruet, The Bridge Tank, France

Güven Sak, The Economic Policy Research Foundation of Turkey, Turkey

Thilo Schäfer, Institut der deutschen Wirtschaft, Germany

Hannah Schind ler, Climate Transparency, Germany

Gregor Schwerhoff, MCC, Germany

Gaurav Sharma, Observer Research Foundation, India

Thomas Spencer, Institut du développement durable et des relations internationales, France

Jan Steckel, MCC, Germany

Ulf Sverdrup, Norwegian Institute for International Affairs, Norway

Sonja Thielges, IASS, Germany

Huifang Tian, Institute of World Economics and Politics, Chinese Academy of Social Sciences, China

David Uzoski, International Institute for Sustainable Development, Switzerland

Laurie van der Burg, Overseas Development Institute (ODI), United Kingdom

Eike Velten, Ecologic Institute, Germany

Elena Verdolini, Fondazione Eni Enrico Mattei and Euro-Mediterranean Center on Climate Change, Italy

Ernesto Viglizzo, CARI, Argentina

Ulrich Volz, DIE, Germany

Olaf Weber, CIGI, Canada

Shelagh Whitley, ODI, United Kingdom

Peter Wolff, DIE, Germany

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67 Erb Street West
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