

Carbon pricing

Mobilizing non-state actors on a global issue with local implications

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SUMMARY

- An effective carbon price should send economic and political signals that shift public and private investment to increase the competitiveness of low-carbon solutions (fuels switching, deployment of renewable energy, etc.) and stay below the 2°C trajectory.
- In 2016, over 40 countries and 20 provinces and cities have established an explicit price on carbon through carbon taxes or emissions trading systems. The choice of the carbon pricing instrument depends largely on the national or local circumstances and priorities.
- Carbon pricing should not be a stand-alone policy and should be part of a coherent energy and climate policy framework in order to achieve an effective low-carbon transition in all economic sectors.
- In 2015, \$26 billion in government revenue was generated in the world through carbon pricing initiatives. These revenues can be leveraged to yield economic and environmental benefits at the national and local level.
- The Paris Agreement provides the necessary framework to facilitate the uptake of carbon pricing.

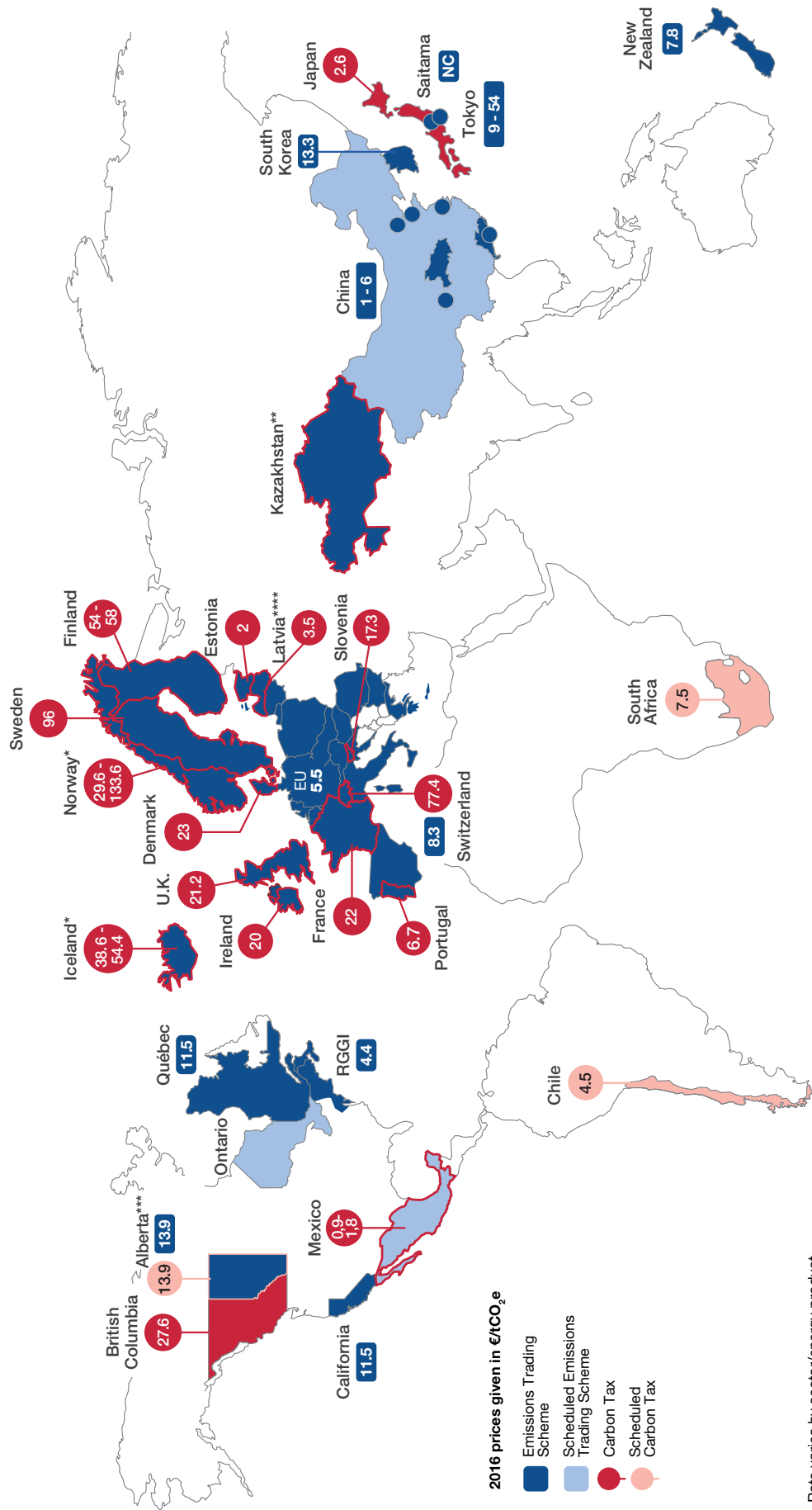
1. A growing trend towards a patchwork of carbon prices rather than a single carbon price

In order to reduce the effects of the global rise in temperature within an appropriate timescale, countries and non-State actors are seeking viable opportunities to reduce their greenhouse gas (GHG) emissions. Although carbon pricing is not a new solution, there are an increasing number of studies demonstrating its long-term effectiveness as one component of a harmonised climate policy framework in facilitating the transition towards a low-carbon economy.

Setting an effective price on carbon emissions takes into account future risks associated with climate change and increases the competitiveness of low-carbon measures such as deployment of renewable energy, finding alternatives to fossil fuels, developing energy efficiency measures, and increasing investments in low-carbon technologies for all economic sectors. This price can also encourage low-carbon consumption choices. In addition to **creating a short-term economic signal** which enhances the competitiveness of actions that lower GHG emissions, a carbon price should also **send a credible long-term signal** to encourage the adoption of new strategies or investments in low-carbon technologies.

Some economists believe that if the international community sets a single global carbon price, this may enable the international efforts to reduce GHG emissions to be shared at the lowest cost. This theory is supported by the idea that the damage caused by one ton of carbon dioxide (tCO₂) is the same regardless of where it takes place and that a broader carbon policy scope would lead to a more economical reduction of emissions.

Carbon pricing world map



2016 prices given in €/tCO₂e

- Emissions Trading Scheme
- Scheduled Emissions Trading Scheme
- Carbon Tax
- Scheduled Carbon Tax

* Rate varies by sector/energy product
 ** ETS suspended until 2018
 *** The 2015 Specified Gas Emitters Regulation (SGER) price is the fee paid into the Climate Change and Emissions Management Fund, set at €10.9/tCO₂e. The Carbon Competitiveness Regulation (CCR) will replace the SGER in 2018, at which point, an economy-wide carbon price of €21.8/tCO₂e will be set
 **** Latvia has two taxes on carbon emissions: a Natural Resource Tax and a Tax on cars and motor vehicles
China ETS pilots: Beijing, Chongqing, Guangdong, Hubei, Shanghai, Shenzhen and Tianjin
RGGI: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, Vermont
 Note: Prices were calculated using exchange rates provided by XE.com on 8 July 2016

For other economists, however, there is no reason to set the same carbon value on the global level, particularly given the vastly different economic and social factors (population, GDP, energy mix) between countries. Another obstacle to establishing a single carbon pricing system would be the potentially high costs of implementation. Moreover, in the short-term, achieving a political consensus between States would likely be unrealistic and involve a very long and difficult process. Indeed, envisaging a single global carbon price is not a credible solution in the current context of international climate negotiations.

Beyond theory, the results of economic analyses show that carbon pricing policies implemented in multiple countries could result in higher benefits, given the co-benefits of reducing GHG emissions such as the reduction in health problems. According to the IMF (2014), these co-benefits vary considerably depending on the country (for example, depending on how much pollution the population is exposed to) and setting different carbon prices leads to much stronger advantages than with a single carbon price. A more bottom-up approach is emerging: national and sub-national governments are increasingly establishing carbon pricing policies depending on their local circumstances.

Although this approach does not encourage direct universal participation in carbon pricing, it enables countries to be more ambitious in terms of establishing an instrument which fully corresponds to their circumstances and national priorities. In the future, these various instruments may converge in order to coordinate GHG emission regulations.

2. The choice of carbon pricing instrument depends on national considerations

The aim of carbon pricing is to put an economic value on a ton of GHG emissions to redirect the flow of public and private funding towards low-carbon investments. **Depending on the specific circumstances** (political and economic context as well as the emissions profile, energy system, etc.) **and priorities, political or economic decision-makers choose the most appropriate economic instrument for reducing their GHG emissions.**

Some instruments are based on prices such as carbon taxes, while others are based on carbon intensity targets like emissions standards or a *volume of emission reductions* such as emission trading schemes or project-based mechanisms.

- The **carbon tax** is a monetary levy added to the sale price of a good depending on the quantity of GHGs emitted during its production and/or use. A carbon tax may be applied at various stages of the supply chain and may target upstream producers or downstream companies and end users.
- The **emissions standard** is a benchmark set by the legislator which determines a quantity of GHG emissions to be respected during the production of a good or a technology.
- The **Emissions Trading Scheme (ETS)** is a mechanism that sets emission reduction obligations for market participants and distributes emission quotas corresponding to this ceiling. Participants can buy – to compensate for excessive emissions – or sell their quotas – to promote additional reduction efforts.
- The **GHG emission reduction project-based mechanism**, which compensates for reductions in emissions beyond the benchmark level, may be complementary to these instruments. These can function as voluntary or obligatory remuneration systems for GHG emissions by funding emission reduction projects (clean development mechanism, joint implementation, Japanese Joint Crediting Mechanism, etc.). These mechanisms contribute towards the emergence of a carbon price in sectors which are not covered or for new stakeholders who voluntarily agree to participate in this mechanism.

3. Increase in the adoption of carbon pricing: 13% of the world's GHG emissions are already covered

More than 40 countries and 20 provinces or cities have launched or plan to launch carbon pricing mechanisms, according to the World Bank.¹ Among them are major emitters such as China, South Korea, Europe, South Africa, Japan and Mexico.

In 2016, 13% of global emissions were covered by an explicit carbon pricing mechanism. These carbon pricing policies currently include 15 ETSs and 16 carbon taxes. As part of the preparations for the Paris Agreement (COP21), more than 90 of the 162 voluntary national contributions (iNDC) subject to the UNFCCC² also mention the possibility of using bilateral or multilateral market mechanisms as part of their national decarbonisation policy framework.

¹ World Bank, 2016, Carbon Pricing Watch, available <https://openknowledge.worldbank.org/bitstream/handle/10986/24288/CarbonPricingWatch2016.pdf?sequence=4&isAllowed=y>

² UNFCCC, iNDCs submission website: <http://www4.unfccc.int/Submissions/INDC/Submission%20Pages/submissions.aspx>

Economic actors now need to take this mosaic of prices into account in their decisions, while being aware that an economic value of a tCO₂e in one jurisdiction does not necessarily have the same impact in another.

4. Carbon price must be one component of a coherent policy

Carbon pricing policies alone are insufficient to encourage a transition to a low-carbon economy in all economic sectors. In addition to explicit carbon pricing, other sector-specific policies or decarbonisation opportunities are required: for example, providing grants to promote the use of renewable energies can implicitly introduce a carbon price signal. This coherent combination of climate-energy policies is indispensable to cover all economic sectors (in particular sectors which are not highly sensitive to the effects of a price signal) and thus creates a climate of trust in investment decisions, both for investors and for companies.

These climate-energy policies exist alongside a combination of global regulations and measures (investment, taxation, innovation, trade, adaptation) and sectoral measures (electricity, mobility, agriculture, forestry management) which have very different end

objectives. According to the OECD³, **ensuring their alignment and coherence is indispensable to avoid incompatibility or even a counter-productive effect, that could reduce the environmental benefits of climate-energy policies.**

Currently, little or no coherence exists between these policies. For example, climate-energy policies which set ambitious low-carbon strategies may exist alongside economic incentives that encourage further extraction and consumption of fossil fuels which can create a negative carbon price signal. In 2014, grants for the consumption of fossil fuels reached 493 billion dollars (International Energy Agency⁴). However, global climate financing was estimated at 391 billion dollars in 2014 (Climate Policy Initiative⁵). This contradiction disrupts political signals and hinders the private sector from engaging in investments which are compatible with the 2°C trajectory.

- 3 OECD, 2015, *Aligning policies for a low-carbon economy*, available <http://www.oecd.org/env/aligning-policies-for-a-low-carbon-economy-9789264233294-en.htm>
- 4 IEA, 2015, *fossil fuel subsidy database*, available <http://www.worldenergyoutlook.org/resources/energysubsidies/fossilfuelsubsidydatabase/>
- 5 Climate Policy Initiative, 2015, *Global landscape of climate finance 2015*, available <http://climatepolicyinitiative.org/wp-content/uploads/2015/11/Global-Landscape-of-Climate-Finance-2015.pdf>

THE WESTERN CLIMATE INITIATIVE: STRENGTH IN NUMBERS

The Western Climate Initiative (WCI) was created in 2007 by several Canadian provinces and U.S. states to define a joint objective for reducing emissions and for establishing a carbon pricing mechanism. For two years, representatives of the member jurisdictions (Arizona, California, British Columbia, New Mexico, Manitoba, Montana, Ontario, Oregon, Quebec, Utah and Washington) held joint negotiations regarding their entire legislation on the operation and governance of their future ETS. The objective of this coalition is to guarantee the development of an effective joint climate policy. While creating a carbon market on the scale of their jurisdiction may be difficult, working together leads to considerably better economic and environmental results. The uniqueness of this initiative is that the coalition designed the ETS together from the start. Currently, only California, British Columbia, Manitoba, Ontario and Quebec are members of the WCI. California and Quebec have had a joint ETS since 2014, which Ontario plans to join in 2017.

CHINA: EXPERIMENTING TO FIND THE BEST APPROACH

China has chosen to establish a price on carbon dioxide in two stages. The first stage was an experimental period: between June 2013 and June 2014, two provinces (Guangdong and Hubei) and five cities (Chongqing, Beijing, Shanghai, Shenzhen and Tianjin) established local emissions trading schemes. The diversity of the areas selected represents a range of economic, industrial and geographic models in China. This experiment helped companies covered by the ETS to understand it and to define the characteristics of a national ETS. The second phase involves expanding the mechanism to the national level. The Chinese government announced the launch of a national carbon market in 2017.

The transition towards a low-carbon economy requires that policies as a whole become systematically climate-compatible to send a strong, credible and stable signal to investors.

5. Using carbon pricing revenues to achieve low-carbon transition objectives

One of the main advantages of carbon pricing mechanisms is the generation of new revenue which may further motivate decision-makers to implement carbon pricing policies. The World Bank estimates that in 2015, 26 billion dollars in public revenue was generated through carbon pricing initiatives⁶. This revenue may be used towards multiple ends – including meeting climate ambitions – which may lead to economic and environmental gains. This potential gain is known as the ‘revenue recycling effect’⁷. The European Union (EU), for example, through its EU ETS system, may raise over 230 billion euros between 2015 and 2030 (Figure 5) – a sum that is equivalent to the additional energy sector investments required to shift from an EU New Policies scenario to a 2°C scenario.⁸

The use of revenues from carbon pricing policies may greatly depend on political, economic, legal and social priorities identified by governments. Carbon revenues may be used to fulfill a wide range of objectives, such as:

- **Funding low-carbon development.** Channelling carbon revenues towards R&D and low-carbon innovation can send positive signals to investors to encourage further investment.
- **Supporting economic and social groups which are most vulnerable to a low-carbon transition to minimise the negative effects of carbon pricing on rising energy costs.** For example, the revenue generated may be used to compensate or support targeted industries or demographics. France, for example, uses revenues from the EU carbon market to fund energy-efficient renovations, primarily in low-income households.
- **Developing public infrastructure.** Carbon revenues may be invested in the renovation and construction of new infrastructure. California has planned to earmark a large part of its carbon pricing revenues

to build high-speed and inter-city rail networks to promote the use of public transit.

- **Fulfilling international climate finance commitments.** Revenues can be invested outside of one’s jurisdiction to help fulfill climate finance pledges while investing in cost-effective reductions in developing countries. The United Kingdom has used part of the financial equivalent of its EU ETS revenues to invest in international Clean Investment Funds (CIFs).
- **Strengthening economic activity.** A growing consensus among economists supports the idea of using revenues, in particular those from carbon taxes, to reduce the distortive effects of other taxes in order to promote economic activity and stimulate employment. With an aim to be revenue-neutral, the Canadian province of British Columbia recycles its carbon revenues by providing cuts in income and corporate taxes.

Regardless of how the revenues are spent, a well-defined decision-making and governance framework is required to ensure that, the revenues are used in line with set objectives; progress in achieving these objectives can be monitored and verified; investment plans are able to reflect changing priorities and finally, decisions regarding the allocation of this income are clearly communicated to the public.

6. The Paris Agreement (COP21): a potential driver for the emergence of carbon pricing

Carbon pricing policies do not fall within the mandate of the UN climate negotiations. However, paragraph 137 of the COP21 decision,⁹ in the section on non-party stakeholders ‘recognizes the important role of providing incentives for emission reduction activities, including tools such as domestic policies and carbon pricing’. This decision invites all stakeholders, including States, local governments and private companies, to equip themselves with carbon pricing instruments as a means of achieving the objectives that they have set, without binding them to do so.

Although the Paris Agreement does not explicitly mention carbon pricing, Article 6 mentions the transfer of emissions reductions and defines voluntary cooperative approaches which offer an appropriate framework for the development of transnational carbon pricing policies by recognising the value of reduction measures which

6 The World Bank and Ecofys. 2016. *Carbon pricing Watch*. May 2016.

7 Parry, Ian. 1997. *Revenue Recycling and the Costs of Reducing Carbon Emissions*. June 1997.

8 International Energy Agency (IEA). 2014. *World Energy Investment Outlook*.

9 Paris Agreement, 2015. Paragraph 137 of the legal Decision of the COP to adopt the Paris Agreement (Section V - non-party stakeholders).

may directly or indirectly introduce carbon pricing. This article facilitates the transfer or exchange of efforts to reduce emissions between Parties through the use of 'internationally transferred mitigation outcomes' (ITMOs), a 'Sustainable Development Mechanism' (SDM) or through non-market approaches¹⁰. **The flexibility of these cooperative approaches and the freedom afforded to Parties in deciding whether or not to use these tools may facilitate the expansion of carbon pricing instruments.**

In the coming years, the UNFCCC will launch technical negotiations which will clearly define the rules and modalities of the transparency framework, the monitoring, reporting and verification (MRV) framework, as well as the provisions of Article 6. The result of these negotiations may thus enable a better indication of the extent to which the Paris Agreement will facilitate the development of carbon pricing policies at the local, national and international level.

Alongside the UN's climate negotiations, several multilateral initiatives (such as the G7's Carbon Market Platform, the Carbon Pricing Leadership Coalition and the Partnership for Market Readiness) enable public and private stakeholders to develop further discussions on carbon pricing. These initiatives aim to unite government support for carbon pricing policies, share knowledge and experiences and provide technical assistance to facilitate the implementation of effective carbon pricing policies around the world.

¹⁰ ITMOs function as an emissions reduction unit which can be transferred between Parties to meet national voluntary contribution targets. The SDM could be a global compensation mechanism authorising Parties to reduce emissions outside their jurisdiction.

Find out more

- Alberola et al. 2015. *Putting a price on carbon: Accelerating the dialogue: a challenge for governments and a request from businesses*. I4CE – Institute for Climate Economics. September 2015. <http://www.i4ce.org/wp-core/wp-content/uploads/2015/11/I4CE-Note-Prix-du-carbone-Business-Dialogue-septembre-20152.pdf>
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