

Working Paper

Implementing Effective Carbon Pricing

James Rydge, New Climate Economy

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Overview

Support for carbon pricing is growing around the world. Governments, businesses and investors are recognising that nationally-appropriate taxes and trading schemes, as part of a well-aligned package of policies for low-carbon change, can reduce greenhouse gas (GHG) emissions without harming the economy. Strong, predictable and rising carbon prices send an important signal to markets, helping to align expectations on the direction of change, thereby steering consumption choices and the type of investments made in infrastructure and innovation. They also raise fiscal revenues that can be put to productive uses. Around 40 national jurisdictions and over 20 cities, states and regions, have adopted or are planning explicit carbon prices, covering about 12% of global GHG emissions. The number of carbon pricing instruments implemented or scheduled has almost doubled from 20 to 38 since 2012. Over 1000 major companies and investors have endorsed carbon pricing, and around 450 now use an internal carbon price (US\$40/t CO₂e or higher for some major oil companies) to guide investment decisions, up from 150 companies in 2014.

While this momentum is encouraging, current price levels and coverage of emissions are still very low. Carbon prices vary significantly, from less than US\$1 to US\$130 per tonne of CO₂e, with around 85% of emissions priced at less than US\$10 per tonne. This is considerably lower than the price that economic models suggest is needed to meet the 2°C global warming goal adopted by the international community.

International cooperation on carbon pricing and subsidy reform, in particular between countries of the G20, and with the support of the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF), can help mitigate concerns holding back faster progress. Cooperation can help to overcome concerns about competitiveness impacts from unilateral policy action, improve knowledge-sharing and transparency, provide opportunities to link emission trading schemes, and reduce the costs of action.



Photo credit: V.T. Polywoda/Flickr

About this working paper

This New Climate Economy Working Paper was written as a supporting document for the 2015 report of the Global Commission on the Economy and Climate, *Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate*. It reflects the research conducted for Section 2.5 of the full report and is part of a series of 10 Working Papers. It reflects the recommendations made by the Global Commission.

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New Climate Economy
c/o World Resources Institute
10 G St NE
Suite 800
Washington, DC 20002, USA
+1 (202) 729-7600

New Climate Economy
c/o Overseas Development Institute
203 Blackfriars Road
London, SE1 8NJ, UK
+44 (0) 20 7922 0300

www.newclimateeconomy.report
www.newclimateeconomy.net



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The Global Commission on the Economy and Climate recommends that all developed and emerging economies, and others where possible, commit to introducing or strengthening carbon pricing by 2020, and should phase out fossil fuel subsidies.

Governments should integrate carbon pricing into broader fiscal reform strategies, prioritising the use of resulting revenues to offset impacts on low-income households and for other productive uses such as reducing other distortionary taxes. G20 governments or coalitions of willing governments should work together to enhance efficiency and minimise competitiveness concerns, building on existing peer-review processes and reporting annually on progress. All major businesses should adopt internal carbon prices and actively support carbon pricing policy.

A carbon price in 2030 of US\$75 per tonne of CO₂e in developed countries and US\$35 per tonne of CO₂e in developing countries, on average, could see annual emissions in 2030 reduced by 2.8–5.6 Gt of CO₂e.

1. Introduction

It is now widely acknowledged that one of the most important steps that governments in advanced and emerging economies can take to build a more robust economy and a safer climate is to put an explicit price on carbon.¹ A strong, predictable and rising explicit carbon price – applied through policies appropriate to the national context, including carbon taxes or cap-and-trade systems – can send important signals across the economy, helping to guide consumption choices and investments towards low-carbon activities and away from carbon-intensive ones.² It can also be a better way to raise revenue for productive uses than many existing taxes, such as on employment. Phasing out fossil fuel subsidies – effectively, negative carbon prices – is also crucial, as they distort markets and encourage wasteful use, contributing to air pollution and increasing importing countries' vulnerability to volatile prices.

Around 40 national jurisdictions and over 20 cities, states and regions, have implemented or scheduled an explicit price on carbon, covering an estimated 7 Gt CO₂e, or about 12% of annual global greenhouse gas (GHG) emissions. This is triple the coverage of a decade ago. The number of carbon pricing instruments (implemented or scheduled) has almost doubled from 20 to 38 since 2012.³ Concerns persist that pricing carbon will hurt industrial competitiveness, so most explicit prices are still quite low, less than US\$10 per tonne of CO₂, and there is often no mechanism or plan to increase them. Several countries have also provided exemptions or special treatment to their most polluting energy-intensive industries, thus limiting the effectiveness of the carbon price.

International cooperation can help to overcome this barrier. Trading partners can coordinate the introduction of carbon prices of roughly comparable levels, and thus overcome competitiveness concerns. By working together, countries can also benefit from knowledge-sharing on best practice, along with greater transparency and the opportunity to link trading schemes.

Conditions are now particularly favourable for both carbon pricing and reform of fossil fuel consumption subsidies, due to the fall in global oil prices over the last year, combined with lower gas and coal prices.⁴ G20 countries have already agreed to phase out inefficient fossil fuel subsidies, and several are now acting with support of international institutions such as the International Monetary Fund (IMF), the International Energy Agency (IEA), the Organisation for Economic Co-operation and Development (OECD) and The World Bank.⁵ The Asia-Pacific Economic Cooperation (APEC) economies have made a similar commitment.

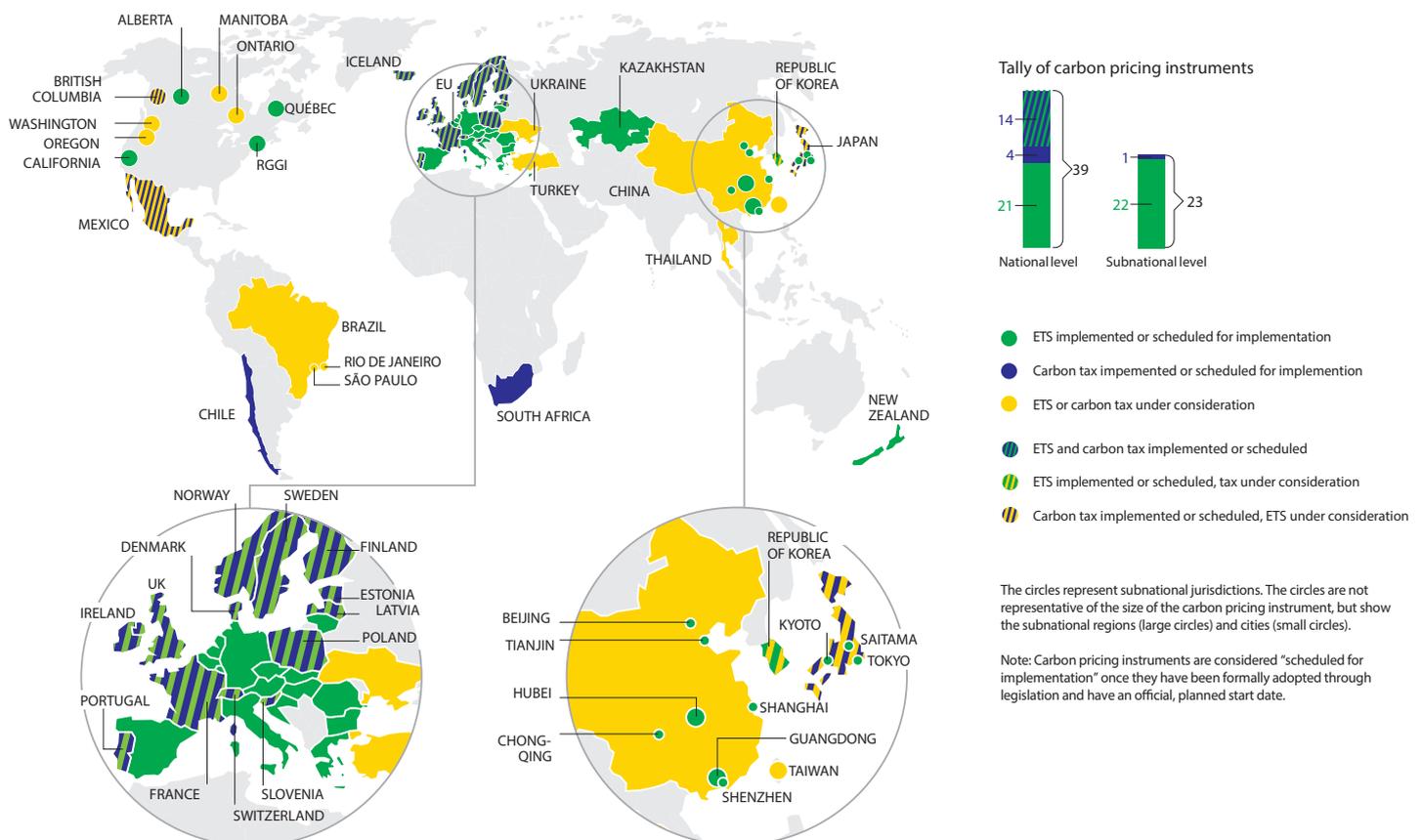
There is a strong case for countries to build on these commitments and introduce meaningful explicit carbon prices across countries at the same time. This working paper begins by looking at the strong momentum for carbon pricing around the world, including growing support from the private sector. It then examines the benefits of carbon pricing, and explains what is needed for successful implementation, drawing on lessons from different countries. Finally, it discusses how to advance international cooperation on carbon pricing, with particular attention to members of the G20.

2. Growing momentum for carbon pricing

The use of explicit carbon pricing is increasing. In 2014, China launched two pilot regional emissions trading schemes (ETSs), bringing the total to seven,⁶ and announced plans to transition to a national carbon pricing system from 2017.⁷ The scheme will be the world's largest, twice the size of the European Union Emissions Trading System (EU ETS), covering around 3–4 billion tonnes of CO₂ – equivalent to the total annual emissions of the European Union (EU), or India, Brazil and Japan combined.⁸ In January 2015, South Korea launched its ETS, the second largest cap-and-trade system in the world, covering more than 500 business entities from 23 sectors. Permits have traded in the range of US\$7–8 per tonne.⁹ The European Union approved important reforms in 2014 to strengthen and revitalise its carbon market, and it has provisionally agreed that implementation of these reforms will be brought forward from 2021 to 2019.¹⁰ California and Quebec linked their carbon trading schemes in 2014, enabling trade in allowances and many other benefits, and in April 2015, Ontario announced that it will launch an ETS linked to the California and Quebec schemes.¹¹

As part of wider fiscal reforms, Chile approved a carbon tax in September 2014, to start in 2018; the rate is US\$5 per tonne of CO₂e and applies to the power sector and large industries, covering around 55% of emissions.¹² South Africa plans to introduce a carbon tax in 2016. Figure 1 maps carbon taxes and emissions trading systems that are operating, under development or proposed around the world.

Figure 1
Summary of existing, emerging and proposed carbon pricing instruments (ETS and taxes)



Support for carbon pricing is also building in the private sector. Many major businesses, including in high-emitting sectors such as oil and gas,¹⁴ are now endorsing carbon pricing – an important shift after many years of business opposition. They see it as a way to drive efficiency and profitable new business opportunities. More than 1,000 businesses and investors expressed support for carbon pricing at the UN Climate Summit in September 2014, including BP, British Airways, Cemex, Braskem, Royal Dutch Shell, Statkraft, Unilever, Statoil and DONG Energy.¹⁵ At the time of writing 437 businesses are reported to be already using an internal carbon price in assessing investments, up from 150 in 2014. Shell, for example, uses a price of US\$40 per tonne of CO₂e, Statoil ASA US\$50, and ExxonMobil US\$80.¹⁶ In May 2015, at the Business & Climate Summit 2015 in Paris, 25 global business networks representing more than 6.5 million companies called for “robust and effective carbon pricing mechanisms as a key component to gear investment and orient consumer behaviour towards low-carbon solutions and achieve global net emissions reduction at the least economic costs”.¹⁷

These developments reflect an increasing understanding of how to design successful carbon pricing policies and unlock their benefits at the national and corporate level; countries and businesses are recognising the wide range of economic benefits that are possible. They are also learning how to manage many of the challenges that can arise around these reforms, which may make it easier for others in the future.¹⁸

Conditions are now particularly favourable for both carbon pricing¹⁹ and fossil fuel consumption subsidy reform due to the fall in global oil prices over the last year, combined with lower gas and coal prices. While it is not yet clear whether these lower fossil fuel prices will last, in the short term they can help to offset any energy price increases resulting from these measures, making it easier for consumers and businesses to adjust, and reducing political resistance.²⁰ It is notable that a number of countries, including Mexico, India and Indonesia, have seized the opportunity to advance reform of fossil fuel subsidies over the last year. Many of these reforms are expected to be permanent – i.e., they are unlikely to be reversed if energy prices rise. This stronger momentum is supported by the G20 commitment to rationalise or phase out fossil fuel subsidies from 2009, which was reaffirmed again most recently in 2014, as well as a similar commitment from APEC countries.²¹

3. The economic and climate case for carbon pricing

As set out in *Better Growth, Better Climate*, experience with carbon prices to date suggests that they have four key benefits: they are an efficient way to reduce GHG emissions; they are a useful way to raise revenue to support public priorities; they provide wider environmental and energy security benefits; and they provide a clear and credible price signal to guide business expectations. Below we address each of these in turn, and examine key factors for successful implementation.

3.1 CARBON PRICES ARE AN EFFICIENT WAY TO REDUCE GHG EMISSIONS

Carbon prices set through broad-based taxes or cap-and-trade systems are an economically efficient way to tackle the greenhouse gas market failure.²² Recent evidence from the electricity sector indicates that these have been the cheapest policies to reduce emissions.²³ Carbon prices come in many forms, and even non-price-based regulatory measures to reduce GHG emissions impose an “implicit” price on the release of carbon and thus can be considered “implicit carbon taxes” (see Box 1). Here we focus on explicit carbon prices.

Box 1

Carbon prices

Explicit carbon prices can either be set through a carbon tax, expressed as a fixed price per tonne of emissions, or through cap-and-trade systems, where an emissions reduction target is set through the issuance of a fixed number of permits (one permit is usually equal to one tonne of emissions), and the price is set in the market through supply and demand.

Most countries also levy various explicit taxes on fuels for transport. Some are ensuring that these taxes better reflect the carbon content of different fuels, to internalise the market externalities of fuel burning. For example, Vietnam took the approach of adjusting taxes, including on transport fuels, to better reflect carbon content. These reforms boosted investment and domestic demand for goods and services.²⁴ France has also adopted a carbon tax on transport, heating and other fossil fuels.²⁵ Many countries, developed and developing alike, may adopt this approach, as this can be a straightforward and practical extension of existing fuel excises which are already well established and widely accepted.²⁶ These transport fuel taxes, however, generally reflect a range of additional externalities, such as congestion, road damage and local air pollution, and thus in order to reflect all of these will need to be higher per unit of fuel than if only taxing carbon content. The OECD has mapped these taxes for advanced economies.²⁷

While carbon taxes and cap-and-trade schemes put a clear and transparent price on carbon, there are implicit prices associated with compliance by industry and consumers with other climate policies as well. Every climate policy that regulates carbon can be expressed as a (marginal) cost per tonne of emissions reduced, i.e. a figure equivalent to a carbon price. The OECD has produced evidence showing “effective” carbon prices across policy instruments, both those that set an explicit price and those that have an implicit price, in selected sectors including electricity and transport.²⁸ In many countries, the implicit carbon price associated with policy instruments, such as fuel standards or feed-in tariffs, are much higher than explicit carbon prices. However, these policies may be warranted if they tackle specific market failures or political or behavioural barriers that explicit prices do not.

Governments have learned much about the design of explicit carbon pricing policy instruments over recent years. Key lessons and examples are summarised in the recent World Bank report, *FASTER Principles for Successful Carbon Pricing*.²⁹

One of the key lessons, for example, is that cap-and-trade systems need to be responsive to market shocks to maintain robust prices. Europe’s economic downturn after the financial crash in 2008 called for downward adjustments to the caps in the EU ETS, but policy design did not allow this, leading to substantial surpluses and a sharp drop in prices. The EU ETS has been through a difficult time, but is now on a path to reform based on lessons learned. The European Commission has agreed to “backload” some permits, i.e. set aside until a later date, to reduce those surpluses, and has proposed a “market stability reserve” to help keep prices higher and less volatile.³⁰

In addition to good design, the broader policy context is important. A range of policies are needed to tackle different market failures and barriers – including structural, political and behavioural barriers – that can limit the effectiveness of the economic incentives created by carbon pricing. For example, additional policy instruments are needed to tackle barriers that are commonly faced by industry, such as short investment payback periods and capital constraints, prescriptive standards, entrenched customer preferences and other factors.³¹

Carbon prices and complementary policies must also be well aligned and integrated, both within the policy package itself and across the wider economy. The OECD, together with the IEA, the International Transport Forum (ITF) and the Nuclear Energy Agency (NEA), recently published a landmark study on aligning and integrating policies for the transition to a low-carbon economy.³² They conclude that much can be done in non-climate policy portfolios to facilitate the implementation

of core climate policy instruments, such as carbon pricing, and improve their effectiveness. “Misalignments” that unintentionally hinder the climate policy signal exist in finance, taxation, innovation and trade, as well as in sector-specific regulatory frameworks in electricity, mobility and land use. In such cases, policy reform can often have broader benefits for society and the climate, such as reduced costs, improved effectiveness, clearer market signals, and a generally lower risk of policy failure.

Fossil fuel subsidies are one of many examples of misalignment. They are often justified on the grounds of helping the poor or increasing the competitiveness of business and industry. However, energy and fossil fuel subsidies are inefficient ways of achieving these objectives, and there are much more effective approaches.³³ For example, it is estimated that on average only 7% of the benefits from fossil fuel subsidies reach the poorest 20% of the population.³⁴ Governments apply consumption subsidies in many ways, such as by keeping local energy prices below international market prices, or through grants or vouchers to make energy more affordable. Subsidies and tax breaks are also used to support the production of fossil fuels. These are essentially negative carbon prices. Together, these subsidies to fossil fuels add up to about US\$600 billion per year.³⁵ This includes consumption subsidies in emerging and developing economies of around US\$548 billion in 2013,³⁶ and fossil fuel exploration, production and consumption support in OECD countries of around US\$55–90 billion a year.³⁷

Phasing out subsidies to the production and consumption of fossil fuels, as part of wider fiscal and energy sector reform, has many benefits. It can reduce the burden on national budgets; for example, support to fossil fuel consumption in 40 developing countries represents around 5% of GDP and 25–30% of government revenues.³⁸ Reducing this economic distortion allows for a more productive and efficient allocation of resources, which can lead to gains in real incomes and GDP. Angola’s spending on fossil fuel subsidies in 2014, for example, was higher than its spending on health and education combined, and represented 3.7% of GDP. In its 2015 budget, the Angolan government cut fossil fuel subsidies by 60%.³⁹

Reforms also lead to higher energy prices. This can provide additional revenues for utilities to invest in upgrading or expanding supply infrastructure, in particular renewable energy, which becomes more competitive as fossil fuel prices rise. Pricing reforms are considered important for expanding energy access in sub-Saharan Africa, for example.⁴⁰ At the same time, they encourage investment in energy efficiency and conservation, and reduce CO₂ emissions and air pollution from fossil fuel combustion, among other benefits.

There is growing momentum to reform fossil fuel consumption subsidies, helped in part by lower oil prices (which reduce the impact on energy price rises) and motivated by growing fiscal pressures, including in oil-exporting nations where consumption subsidies are often high. In addition to the reasons outlined earlier, reforms have also been motivated by fuel smuggling from countries with subsidised fuels to those without. (It is estimated, for example, that around 10% of fuel consumption is smuggled from Angola to the Republic of Congo and the Democratic Republic of Congo.⁴¹) But it remains true that subsidy reform is very challenging institutionally and politically. Box 2 describes recent reform efforts in developing and emerging countries, how international cooperation is helping, and the potential for more action.⁴²

There has been mixed success on reform of fossil fuel production subsidies. Lower oil prices have led to some increased calls from industry to increase production subsidies, and some governments have acted on such requests, in part due to the royalties they receive from these industries. In the UK, for example, the government already provides generous tax breaks to the oil and gas industry, but agreed to increase support for North Sea oil producers in 2015.⁴³ In Alberta, Canada, however, a newly elected government has pledged to review the Province’s royalties on fossil fuel production.

Box 2

Reform of fossil fuel consumption subsidies⁴⁴

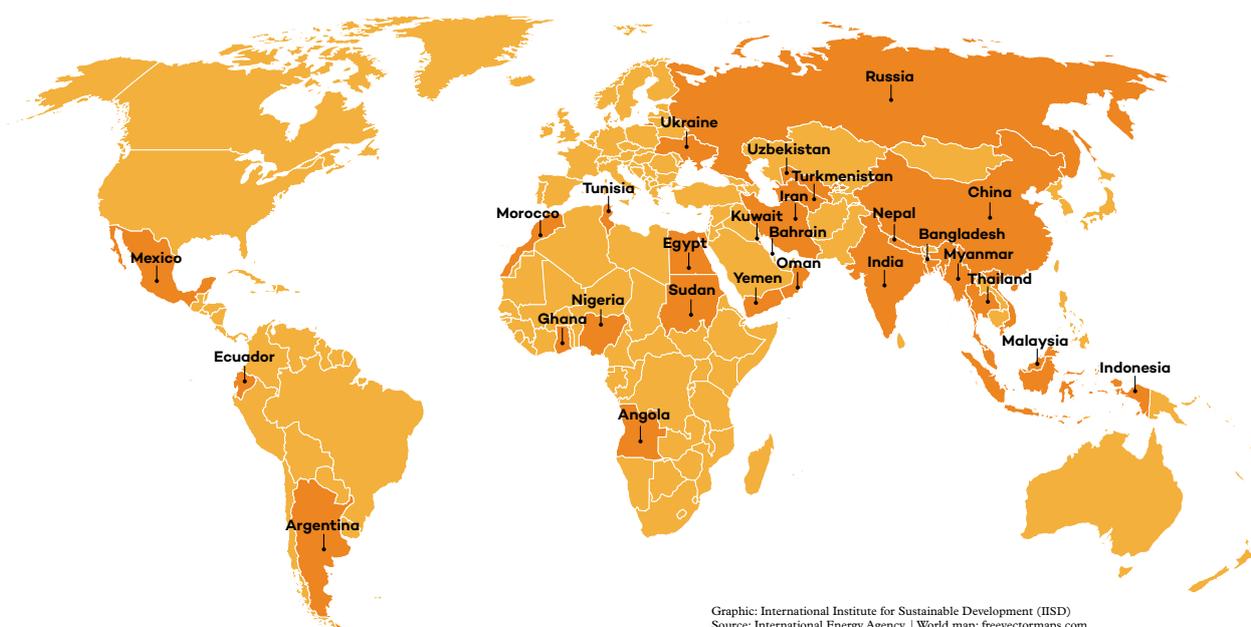
Despite the challenges associated with reform, several countries have made significant progress in recent years. Progress has been helped in particular by increased knowledge and experience of policies, such as in-kind transfers, that redistribute the savings of reform to protect the poorest and most vulnerable.⁴⁵ Twenty-eight countries have attempted reforms in the past two years alone. An IMF review of these efforts classifies 12 as successes (leading to a permanent and sustained reduction of subsidies), 11 as partial successes (reforms achieved reduction for at least a year, but subsidies have been reintroduced or remain a policy issue), and 5 as unsuccessful (price increases or efforts to improve efficiency in the energy sector were rolled back soon after reform began).⁴⁶

One relative success story is Indonesia. After many years of uneven progress on subsidy reform, large increases in the prices of gasoline, diesel and electricity were combined in 2013 with a US\$2.6 billion compensation package to support the poor.⁴⁷ India has also made significant progress. In 2013 it began a phased deregulation of diesel prices, leading to full deregulation by October 2014. Retail prices have remained relatively stable thanks to lower oil prices. To assist poorer households, the government used the newly introduced “Aadhaar” proof of identity and address scheme to provide poor households with a refund direct to their bank accounts for purchased liquefied petroleum gas (LPG) cylinders.⁴⁸ Similarly, in January 2015, India’s finance minister announced a new phase of fossil fuel subsidy reform for LPG and kerosene combined, with an increase in the excise duties on petroleum and diesel.⁴⁹

Figure 2
There is momentum on fossil fuel subsidy reform

Many countries at least partially increased subsidized prices for fossil energy over the last two years.

● Countries implementing reforms in 2013–2014



Graphic: International Institute for Sustainable Development (IISD)
Source: International Energy Agency | World map: freevectormaps.com

Source: IEA, 2014.

Reform attempts in Bolivia and Nigeria have had more mixed results. In 2010, the Bolivian government announced a dramatic 70% increase in prices for fossil fuels. This quickly led to riots and civil unrest, and the reform was abandoned.⁵⁰ Similarly, poor communication about reforms and strong resistance by some groups in Nigeria in 2012 led to the scale-back of initial price increases of 117% for gasoline, to around 50%. Concerns in Nigeria included fear of loss of competitiveness, loss of income for low- and middle-income households, and job losses.⁵¹

Several international collaborative efforts are already helping developing country governments to undertake reforms, including:⁵²

- Maintenance of public databases that give insight into the scale of fossil fuel subsidies per country (OECD, IEA, IMF), including identification of OECD government subsidies and other support measures to fossil fuels and support through export credit guarantees (OECD, Oil Change International, Overseas Development Institute);
- Analysis of the economic, social and environmental impacts of fossil fuel subsidies (IMF, OECD, World Bank, IEA, Global Subsidies Initiative);
- Technical (and financial) assistance and facilitation of consultations with stakeholders (IMF, World Bank, IEA);
- Workshops and platforms that facilitate the sharing of country experiences with reform (G20, Friends of Fossil Fuel Subsidy Reform, World Bank, IMF, Global Subsidies Initiative, United Nations Environment Programme);
- Advocacy for reform (Global Subsidies Initiative, Oil Change International).

Given the difficulty of reform and the high risk of setbacks or failure,⁵³ there is a strong case for support to be stepped up. There are opportunities for future international collaboration to build on these existing initiatives and take them to scale:

- The G20 could build on its 2009 commitment to phase out fossil fuel subsidies when it meets in Turkey later this year, and commit to supporting, progressing and scaling existing initiatives. This could start with setting clear timelines and criteria for reporting on and eliminating fossil fuel subsidies, for example, by no later than 2025.
- Following the release this year of the initial results of the voluntary fossil fuel subsidy peer review processes in G20 and APEC countries (with reviews of the United States, China and Peru), the G20 and APEC could draw preliminary lessons learned and encourage additional countries to engage in peer reviews and widen the subsidies covered in the review.
- Countries could work together, and through the international organisations that support them, to improve the availability of comparable information on fossil fuel subsidies, through the transparent publication of energy pricing and taxation data on government websites and mandatory reporting on fossil fuel subsidies and tax breaks. In the context of the United Nations Framework Convention on Climate Change (UNFCCC), fossil fuel subsidy estimates could be included in regular reporting on progress towards implementation of Parties' National Communications and reform plans in "intended nationally determined contributions" (INDCs).
- Countries could increase technical and financial support available for national reform efforts, with a focus on the assessment of the likely economic and distributional effects of reform and upfront support for the development of "complementary measures".
- Countries could also widen and strengthen commitments to fossil fuel subsidy reform in international processes – e.g. include phase-out of subsidies in bilateral or multilateral trade agreements. As a priority, donor countries should reassess support for fossil fuel power generation through bilateral and multilateral development finance. Export credit agencies could agree to restrict preferential terms for new coal power stations, for example, to limit these to supercritical or more efficient technologies, with a timetable for phasing out the preferential terms adjusted to different country circumstances.⁵⁴

There is a strong case for multilateral and national development banks, which have significant public funding, to play a central role in fostering the reform process. They have the opportunity to better integrate their work on subsidy reform with other parts of their organisations, in particular investing in "complementary measures" and policies, including on infrastructure, social protection, public transport, health and education. This alignment could also involve a strategy to shift away from investments that incentivise high-carbon energy, transport and infrastructure development.

3.2 CARBON PRICING INSTRUMENTS CAN BE USEFUL FOR RAISING REVENUE TO SUPPORT PUBLIC PRIORITIES

The emerging evidence shows that carbon pricing is an effective way to reduce emissions without harming the economy. Sweden introduced its carbon tax in 1991; its economy grew by nearly 60% in 1990-2013 while emissions fell by 23%. In the Canadian province of British Columbia, there was no evidence that the carbon tax adversely affected GDP growth over the five-year period following its introduction in 2008. It did, however, lead to a large and unexpected drop in oil product consumption (reflecting the fact that more substitution options were available in practice than were predicted prior to the introduction of the carbon tax) and GHG emissions fell by about 10% in 2008–2011, compared with a 1% reduction in the rest of Canada. The nine US states in the Regional Greenhouse Gas Initiative (RGGI) grew their economies by 9.2% in 2009–2013 – better than the other 41 states’ 8.8% – while reducing their combined emissions by 18% (vs. 4% in the other states).⁵⁵ A recent study found that in 2012–2014 alone, RGGI had a net economic benefit of US\$1.3 billion on the nine member states’ economies.⁵⁶

Economies are always changing, and those that embrace change do better. Governments need to undertake regular reforms to ensure their economies can respond to opportunities to maintain and enhance their efficiency, productivity and competitiveness. Fiscal reform is central to this task. Fiscal reform involving broad-based carbon prices provides an opportunity to lower the burden of existing taxes on work effort and capital accumulation. This can provide incentives for increasing employment and investment, thus boosting growth.⁵⁷ For example, British Columbia has used its carbon tax revenues, around 3% of the total budget,⁵⁸ to lower income and corporate taxes.⁵⁹

Multiple other benefits of this type of fiscal reform are becoming more widely acknowledged. For example, reducing taxes on work and capital reduces the incentive for people and businesses to stay in the informal sector (fully or partially) as a way to evade taxes.⁶⁰ Carbon prices are also a higher-quality tax base over the short to medium term, as they are usually collected from a relatively small number of firms (e.g. electricity producers, fuel suppliers). This could be particularly valuable in counties with large informal sectors and/or tax evasion problems, as ensuring compliance could be easier and less costly compared with other broader-based taxes.⁶¹

Governments can use carbon tax revenues in a number of ways. The use of revenues should be guided by good principles of public finance, including efficiency, and consideration of distribution and incidence, i.e. where the burden of the tax falls. Some potential productive uses include: reducing existing distortionary taxes, as discussed above; reducing public sector debt/GDP ratios (e.g. the introduction of a carbon tax in Ireland in 2010 raised much-needed revenues and avoided even harsher fiscal tightening measures); spending on public priorities such as health and education; funding innovation (e.g. Quebec and California use revenues from their ETS auctions to fund low-carbon technology advancement); financing international climate action and other climate policies (e.g. the EU distributes EU ETS auction revenues to EU Member States, which use them to fund innovation and climate- and energy-related activities, among other things⁶²); and public financing support for infrastructure investment, for example by capitalising green investment banks. The most productive uses will differ by country, based on their existing social and economic structures, including tax.

Governments often also use a share of the carbon tax revenues to compensate those who are disadvantaged by reform, including consumers facing higher energy prices. Although carbon pricing will increase the efficiency of resource use, with net economic benefits overall, some people and economic sectors may be adversely affected (see Box 3). Neglecting them, or failing to clearly communicate the policies that are put in place to help smooth the transition, has been a major factor in strong resistance to carbon pricing. In most cases, clear and well-communicated policies will be needed to alleviate any distributional impacts on affected groups, in particular on poorer households. *Better Growth, Better Climate* examines distributional policies and recommends that a share of carbon tax revenues be used to compensate affected groups for increases in the cost of living, such as higher energy bills. This needs to be well targeted and may be in the form of cash transfers or social security payments, reductions in marginal income tax rates, or financial help to invest in energy efficiency measures that can offset higher energy bills. International institutions such as the World Bank are helping countries to develop such complementary compensation policies.⁶³ The more revenue is spent on compensation, of course, the less is available for other productive uses.

Box 3

Medium- to long-term structural transition

As *Better Growth, Better Climate* argues, the coming decades will involve major structural transformations, as demographic and technological changes occur. The challenge for governments is to ensure that such transformation aligns with government policy priorities, including the shift to a low-carbon economy, and to manage the transition for those affected, rather than creating blockages that increase the cost of change and reduce efficiency.

A key feature of past periods of economic change and transition is the rise of new wealth-generating industries and the decline of incumbent and unprofitable industries that are unable to transform themselves. The low-carbon transition will be no exception. Policy will be required to help industries restructure or go low-carbon where possible, but also to manage decline. For example, the 1973 oil crisis spurred a low-carbon transformation in Sweden's pulp and paper industry, resulting in an 80% reduction in CO₂ emissions by 1990, while output increased by 18%.⁶⁴ The purpose of carbon pricing policy frameworks today is to send clear and credible price signals that foster a dynamic low-carbon structural transition over the medium to long term. We know that price signals can help to foster economic transition.

Central to a smooth transition is support for workers, both to provide a skilled labour force for the new growth industries, and to retrain or support workers in declining industries. Japan's structural transition during the 1980s is a good example.⁶⁵ Germany is also undertaking significant structural reform of its coal industry that involves close consultation with the workforce, and measures such as retraining and funding for early retirement schemes.⁶⁶

Policies to ensure a "just transition" for those affected by structural change need to tackle the wide range of factors related to the risk of job loss, changes in the type of employment available, and impacts on the communities where workers live. They can take many forms, but all aim to minimise unemployment, promote job creation in growing sectors, and tackle labour market distortions efficiently, while also providing protection for the most vulnerable, such as pensions and other safety nets. Failure to manage this aspect of change well, including distributional impacts on households, could significantly disadvantage workers or other groups, leading to strong resistance to the new policies. This is essentially about making carbon price signals socially acceptable, as well as politically credible and economically effective.⁶⁷ It is a challenging task, but many governments are rising to it.

3.3 WIDER ENVIRONMENTAL AND ECONOMIC SECURITY BENEFITS FROM CARBON PRICES

These include local environmental benefits from reduced local air pollution,⁶⁸ reduced traffic congestion, and better-functioning ecosystems. The human health and avoided mortality benefits of reducing health pollution are particularly large. The World Health Organization (WHO) has estimated that, in 2012, outdoor air pollution – much of it linked to fossil fuel use – caused 3.7 million premature deaths.⁶⁹ *Better Growth, Better Climate* calculates that the value of premature deaths from PM_{2.5} air pollution averaged the equivalent of over 4% of GDP in the 15 largest CO₂ emitters in 2010. Measures that reduce greenhouse gases and air pollution together in these countries would yield health benefits valued at US\$73 per tonne of CO₂ abated.⁷⁰ Carbon pricing can also drive enhanced energy security in energy-importing nations by reducing their reliance on fossil fuels.⁷¹ Moreover, by driving investment in energy efficiency and renewable energy, a carbon price can reduce exposure to increasingly volatile fossil fuel prices and less risk of disruption to energy supplies.

3.4 CLEAR AND CREDIBLE PRICE SIGNALS TO GUIDE EXPECTATIONS

Clear and credible price signals across the economy can align expectations and help provide the private sector with the certainty needed to invest in the three key drivers of growth, resource efficiency, infrastructure and innovation. This can help to accelerate and scale up investments in more efficient products, new business models, new markets, new skills and jobs, and more productive ways of working and operating.

Where carbon prices have long-term credibility, and are aligned with complementary policies, they can provide the incentive to invest in low-carbon infrastructure. Even though such investments will often lead to significant returns over time, clear long-term policy signals can help to ensure upfront financing is available given that the low-carbon investments often have high upfront costs and different risk-return profiles from high-carbon investments. Weak, absent or unclear carbon price signals will slow investment and change and increase the economic and social costs of a low-carbon economic transition.

Experience shows that many existing carbon prices have failed to send a clear and strong signal, limiting their effectiveness. This was the case initially with the EU ETS, for example, which has been hampered by a surplus of permits and resulting low prices, a lack of credibility around the future of the policy, and unclear signals as key energy-intensive industries were given overly generous compensation. As of April 2015, allowances in the EU ETS were trading at around US\$8 per tonne of CO₂e, and in California, at around US\$13 per tonne.⁷²

Weak carbon prices, including fossil fuel subsidies, also fail to send clear low-carbon signals to investors. This is reflected in the continued high levels of investment in fossil fuel-based energy, around US\$950 billion in 2013.⁷³ Price floors, as used in the UK, California and in the seven Chinese pilot schemes, can ensure a minimum price level in emissions trading, providing greater certainty and more consistent policy signals. This ensures that industries covered by the carbon price, investors and technology providers can make decisions knowing what the minimum price in the system will be at any time in the future.

However, with or without price floors, current prices are likely to be too low to send clear and sufficient signals to investors, consumers and technology providers. As of April 2015, prices in China's emissions trading pilot schemes were in the range of US\$4–8 per tonne. South Korea and Switzerland's ETS prices were around US\$9 per tonne. South Africa's carbon tax is planned to start in early 2016 at about US\$10 per tonne of CO₂, and rise by 10% per year, but with substantial tax exemptions in some sectors.⁷⁴ Ireland, Denmark and British Columbia have carbon taxes in the US\$22–24 range. France, which in its 2014 budget adopted a carbon tax of €7 per tonne of CO₂, raised it to €14.50 for 2015. It will increase to €22 for 2016 and legislation approved in July 2015 will raise the tax to €56 in 2020 and to €100 in 2030.⁷⁵ Sweden has a price of US\$130 per tonne of CO₂e in some sectors.⁷⁶ This has sent clear signals that have led to a strong economy and large emissions reductions at the same time.

Many estimates of the costs of projected climate change, including from modelling exercises, also suggest higher carbon prices would be appropriate. For example, analysis for the US government has recommended a “social cost of carbon” (an estimate of the economic damage associated with a one tonne increase in carbon dioxide emissions in a given year) of around US\$36 per tonne of CO₂ (the average of US\$11–56, with the low end based on a higher discount rate), rising to around US\$50 (US\$16–73) in 2030.⁷⁷ Prices today are also at the lower end of the spectrum of internal carbon prices that businesses are already applying to guide their own internal investment decisions. In 2015 the Carbon Disclosure Project (CDP) found 437 worldwide were using internal carbon prices as a tool to drive investments in GHG emission reductions and mitigate risks from future climate policies. Nearly 600 other companies said they are considering carbon pricing in the next two years.⁷⁸ The prices reported ranged from under US\$1 to over US\$150 per tonne of CO₂e. Several of the companies are in the oil and gas sector, such as Shell (US\$40), ConocoPhillips (US\$6–51) and ExxonMobil (US\$80), but the list also includes companies in a wide range of other sectors, such as Google (US\$14), Microsoft (US\$4.4), Disney (US\$10–20), and Nestlé (US\$15.47).⁷⁹

3.5 MODELLING THE IMPACT OF CARBON PRICES

As indicated in *Better Growth, Better Climate*, ex ante modelling studies suggest that the economic cost of efficient climate policies is likely to be in the range of about 0.5–2% of a country's GDP in 2030 (compared with baseline), with costs varying, in part, based on how tax or auctioning revenues are recycled.⁸⁰ However, these models generally do not capture most of the benefits from carbon pricing, such as reduced air pollution and the full range of benefits from using revenues to lower other taxes, as well as the benefits from avoided climate damages. As a result, they tend to overstate costs to GDP over the medium to long term. *Better Growth, Better Climate* examines the issue in depth and finds that many of the perceived “trade-offs” between economic growth and climate action disappear when policy is examined in the context of dynamic underlying economic change, and when existing economic inefficiencies and the multiple benefits of action are taken into account. The models may also underestimate some potential costs, such as the cost-effectiveness of public policy intervention in practice. Costs can rise if governments implement policy instruments in a sub-optimal way, such as imposing very divergent carbon prices on different parts of the economy or trying to promote fossil fuel extraction at the same time as emission reductions. Many models also assume full employment, and that wages adjust instantaneously to new situations; this can lead to both underestimating the benefits of climate action and underestimating some of the costs of a low-carbon transition.⁸¹

Notwithstanding the limitations of the models, which are important to keep in mind, they are useful tools. One key message is that, looking across a wide range of economic models and scenarios, the projected GDP costs associated with carbon pricing look like “background noise” when compared with the strong underlying growth that the global economy is likely to experience over the coming decades. Another message from the modelling literature is that carbon tax revenues must be put to good use, such as to reduce existing distortionary taxes; as discussed below, giving out emissions permits for free, as has often been done, has a large impact on the cost-effectiveness of carbon pricing.⁸²

4. International cooperation

4.1 A BETTER WAY TO OVERCOME COMPETITIVENESS CONCERNS

We have learned a great deal from experiences to date with carbon pricing at the national and regional levels, and there is growing evidence that carbon pricing is good for both the economy and the climate. But there are still major impediments to scaling up the use of carbon pricing across sectors and countries because of anxieties around competitiveness impacts. Greater international coordination on pricing carbon and reforming fossil fuel subsidies can help to minimise the real or perceived impacts on competitiveness of unilateral action.

Recent evidence from carbon pricing shows that these concerns around competitiveness have not materialised on a significant scale in practice.⁸³ *Better Growth, Better Climate* found that the direct competitiveness impacts of a carbon price are small for countries that moved early, and there is little evidence of “carbon leakage” (the movement of production and emissions to locations with less stringent climate policy). This is partly due to the lack of stringency of carbon prices to date. And the latest research suggests that even at higher carbon prices, the impacts on industrial competitiveness in Europe are likely to be low.⁸⁴

Nevertheless, there are often concerns about the potential competitiveness impacts and carbon leakage from high carbon prices for a small group of carbon-intensive and trade-exposed industries, such as cement, paper, metals and chemicals, which compete largely on cost.⁸⁵ These risks are real where carbon price signals are strong and the stringency of climate policies differ significantly across jurisdictions.⁸⁶ However, the actual impact from higher carbon prices on competitiveness and location decisions is complex and hard to ascertain, and must be examined in the context of the wider business environment. In practice, investment and production location decisions are determined by a range of factors, such as proximity to product markets, transport costs, construction costs of new facilities, labour costs, access to materials, business risk, other taxes, local institutions and local infrastructure, with climate policy generally a less significant issue.⁸⁷ Other factors may also come into play, including the intensity of competition, opportunities for abatement in a sector, profitability, and price sensitivity of customers.⁸⁸ Different policies have been used or proposed to tackle these concerns, including free allocation of allowances and border carbon adjustments (BCAs). Both of these approaches are problematic, however.

Many emissions trading systems have allocated permits for free to industry. Methods of free allocation (e.g. grandfathering, output-based allocation and fixed sector benchmarking⁸⁹) differ in terms of administrative complexity and effectiveness in preventing leakage, and need to be revised over time, but they all reduce the potential benefits of carbon pricing, since the revenues that could have been put to productive use are forgone. Today, this practice is increasingly confined to shielding trade-exposed and emissions-intensive industries from perceived adverse effects on their international competitiveness, as in the EU ETS. In the power sector, free permits are mostly limited to situations where producers cannot pass on carbon costs (as in China), but in Eastern Europe, for example, they still support large and politically influential coal-fired generators. Governments have also kept effective tax rates on the carbon content of different types of energy use low, on average, with taxes on high-emitting types of energy, such as coal, low or non-existent in many countries.⁹⁰

Other forms of compensation can include lump-sum rebates; administrative exemptions; support for energy efficiency improvements; payments to reskill workers or restructure operations (to increase efficiency and competitiveness in the medium to long term); or funding for low-carbon research and development. Experience suggests that the level of compensation required to ensure an initial profit-neutral impact from carbon pricing is likely to be relatively small, perhaps around 15% of total carbon tax revenues, according to some analyses.⁹¹ Where compensation is provided, there are good grounds for making it temporary, with clear phase-out plans as the industry and firms adjust and the competitiveness concerns subside, and governments should avoid applying total exemptions from carbon prices.

Some have called for the introduction of BCAs, measures that would apply a tax on the carbon embedded in traded products and services. Some commentators have argued that they would “level the playing field” with countries with weak or no climate policies. BCAs have also been suggested as a “threat” to spur countries towards more comprehensive global climate action. As discussed in *Better Growth, Better Climate*, however, they are controversial, especially where they are seen as discriminating against developing countries, and significant technical and administrative challenges exist around their implementation.⁹²

Compensation, including free allowances, and BCAs are second-best instruments. A better approach is to coordinate policies internationally to overcome these competitiveness and leakage concerns, by reducing the differences in pricing and subsidy

policies between trading partners. We now have the experience and momentum to move to the first-best option. Sharing knowledge and experience among countries on the factors that have enabled successful reforms, as well as the challenges, is the first step to international cooperation.

4.2 HOW TO FOSTER GREATER INTERNATIONAL COOPERATION ON CARBON PRICING

As noted earlier, carbon pricing is already spreading around the world. Several initiatives are helping to accelerate action. The World Bank is working with the We Mean Business Coalition of major corporate associations and other partners to increase knowledge on how to design and implement successful carbon pricing systems through the Carbon Pricing Leadership Coalition (CPLC).⁹³ They are developing forward-looking carbon pricing pathways that look at how business and government can define the business and economic case for carbon pricing. As mentioned above, the World Bank Group and the OECD, with inputs from the IMF, have also developed a set of principles for successful carbon pricing, based on the lessons learned from carbon pricing experience in jurisdictions around the world.⁹⁴ Their report contains many rich examples that complement the work in this paper. The aim of this work is to enlarge the number of countries and businesses adopting and supporting carbon pricing prior to the UN Climate Change Conference (COP21) in Paris and beyond.

The World Bank Partnership for Market Readiness (PMR) has also helped to accelerate action. The PMR provides support to countries to prepare and implement carbon pricing instruments, and other climate policies, with the aim of scaling up emissions reductions. It serves as a platform to share lessons between countries and organisations.⁹⁵ The International Carbon Action Partnership (ICAP) also runs summer schools and training for officials of governments considering introducing carbon pricing.⁹⁶

These initiatives should not be taken to mean that a common carbon pricing policy instrument will be implemented across countries. The actual policies and prices adopted will vary widely,⁹⁷ with each country or region in most cases choosing its own “bottom-up” policies.⁹⁸ Instruments are chosen and designed, and prices set, to reflect each country’s climate ambition, increasingly as expressed in its INDC, the existing economic structure and policy landscape, including other climate and energy policies; and a range of other political, social and economic factors, as alluded to above.⁹⁹

Nevertheless, analyses have shown that there are potential benefits from linking carbon pricing schemes across countries or sub-national regions, to minimise price differences.¹⁰⁰ This can send a more consistent and credible global price signal that aligns expectations worldwide on the direction of change. Linking cap-and-trade schemes can also lower the cost of a given level of emission reductions – for example, by ensuring the lowest-cost emissions reductions are realised across the linked countries, reducing price volatility and increasing market liquidity. It also helps to reduce competitiveness concerns and potential for emissions “leakage” from having multiple unconnected carbon markets with different prices and levels of effort.¹⁰¹

In practice, the benefits of linking are greatest when markets have a similar size, similar levels of ambition, and other common features, such as the types of price controls and allocation methods used.¹⁰² The extent of existing tax and externality distortions is also relevant.¹⁰³ Most of the roughly 20 cap-and-trade schemes in operation have established or proposed at least one international linkage with another cap-and-trade or credit system.¹⁰⁴ California and Quebec linked their carbon pricing schemes in 2014, and Ontario will soon join them. Quebec faces the biggest impact from its linking with California. As Quebec has a far smaller market, just over one-sixth the size of California’s, lower emissions intensity and fewer cheap abatement opportunities, the carbon price in Quebec will fall substantially and largely be determined by California. The Californian price will rise slightly from linking. These differentials mean that Quebec will purchase excess allowances from California resulting in a net flow of revenue to California.¹⁰⁵ The EU ETS already links 31 countries, with potential to be extended to other neighbouring countries. RGGI links nine US states in a relatively compact area, whose economies and energy systems are fairly interconnected.¹⁰⁶

There are three key ways for countries to increase their cooperation on carbon pricing:

1. *Commit to carbon pricing:* The G20 has a unique opportunity to lead on carbon pricing. It made a commitment on the phase-out of inefficient fossil fuel subsidies in 2009 and reaffirmed this repeatedly, most recently in 2014. This is an important piece of signalling, and it has marshalled institutional support from the OECD, the World Bank, the IEA and the IMF, which are providing research and helping countries to implement reform.

There is a clear opportunity now for the countries of the G20 to build on these initial efforts. Prior to the Paris Climate Change Conference, it would send a strong signal if G20 countries committed at the G20 Leaders Summit in Turkey this November to establishing clear, credible and rising explicit carbon prices across their economies, as part of a well-aligned and integrated

multiple policy framework for low-carbon growth and development.¹⁰⁷ This would help to progress the international climate agreement in Paris and support stronger domestic action. The exact approach for G20 countries to implement the commitment could be agreed in Beijing in 2016.¹⁰⁸ A coalition of “countries of the willing” could also form to start early action and demonstrate leadership in the G20.

Countries beyond the G20 could also commit to introducing carbon pricing policies, including the phasing out of fossil fuel subsidies, in a way that is consistent with this commitment, subject to their own institutional capacity and support from international organisations to implement such policies. A sensible first step in many countries is to mandate monitoring, reporting and verification (MRV) of emissions for businesses and industry.

In addition, strategies to link between different carbon pricing schemes to maximise the benefits from linking could be explored, and the existing linkages could be strengthened.

2. *Commit to annual reporting on action and progress:* A coordinated group of international institutions, such as the OECD, the IEA and the IMF, could work together to promote transparency and create clear and aligned expectations among businesses and investors on the level and direction of subsidy phase-out and carbon pricing in the G20 and other countries. This could also be reflected, for example, in the World Bank’s annual *State and Trends of Carbon Pricing* report, where plans are already underway to begin assessing the effectiveness of existing and planned carbon pricing systems, which will add an important qualitative element to the international debate and assessment of progress.

3. *Commit to knowledge-sharing that builds on existing peer review processes:* Achieving these commitments will require sharing knowledge of best practices across G20 countries and with other countries. Mutual learning and review, in particular with neighbouring countries, can help to build trust, and accelerate and scale up action. The G20 and APEC are undertaking voluntary peer review processes on fossil fuel subsidies, and this could be extended to carbon pricing. And international institutions are already providing support for fossil fuel subsidy reform and now also for carbon pricing; their role could be strengthened to better support country efforts to make progress.

5. Conclusion and recommendation

The case for carbon pricing is strong, and there is growing momentum. The use of carbon pricing is increasing as awareness of its multiple benefits grows and countries understand how to manage the costs of change better, such as by ensuring a just transition for affected workers and alleviating impacts on low-income households. Learning from recent experiences of carbon pricing around the world can help countries and businesses implement carbon pricing successfully. Governments are also realising that carbon pricing is central to structural reforms for managing economic change and the climate risk that they will face over the coming decades.

Cooperation across G20 or other willing governments is essential if the world is to accelerate action on carbon pricing. It can promote learning and reduce many of the perceived risks of carbon pricing, such as competitiveness concerns, and thereby reduce political resistance. Countries of the G20 are well placed to take the lead and 2015 provides a good opportunity to cooperate around the establishment or strengthening of carbon prices.

The global mitigation potential in 2030 from implementing this commitment is significant. Mitigation analysis conducted for this report, based on IEA modelling scenarios, examined the impact on global GHG emissions if carbon prices increased to an average of US\$75 per tonne of CO₂e in developed countries and US\$35 per tonne in developing countries. (Fossil fuel subsidy phase-out was excluded due to uncertainty around the estimates.) The potential global annual emissions savings from this level of carbon pricing in 2030 are estimated to be in the order of 2.8–5.6 Gt of CO₂e.¹⁰⁹ In the light of this analysis, **the Global Commission on the Economy and Climate recommends that all developed and emerging economies, and others where possible, commit to introducing or strengthening carbon pricing by 2020, and should phase out fossil fuel subsidies.**

Governments should integrate these measures into broader fiscal reform strategies, prioritising the use of resulting revenues to offset impacts on low-income households and for other productive uses such as financing reductions in existing distortionary taxes. Coalitions of willing governments should work together to enhance efficiency and minimise impacts on competitiveness, building on existing peer-review processes to share knowledge, and reporting annually on progress. All major businesses should adopt internal carbon prices in their business strategies, and actively support carbon pricing policy.

ENDNOTES

¹ See Chapter 5 in: Global Commission on the Economy and Climate, 2014. *Better Growth, Better Climate: The New Climate Economy Report*. The Global Report. Washington, DC. Available at: <http://newclimateeconomy.report>.

The Financial Times, 2015. The compelling case for carbon pricing, Editorial (FT View), 1 June. Available at: <http://www.ft.com/intl/cms/s/0/5bc4f5a4-0851-11e5-85de-00144feabdc0.html#axzz3gjkWefX8>.

Bowen, A., 2011. *The Case for Carbon Pricing*. Grantham Research Institute on Climate Change and the Environment, Policy Brief, December. Available at: http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/02/PB_case-carbon-pricing_Bowen.pdf.

While low-income countries are often focused on policy for adaptation and resilience, carbon pricing in an appropriate form can help low-income countries use resources more efficiently and avoid risky high-carbon lock-in.

² To be fully effective, a carbon price needs to be part of a well-aligned and integrated package of policies for market failures that hold back low-carbon investment and change.

See: OECD, 2015. *Aligning Policies for a Low-Carbon Economy*. Produced in cooperation with the International Energy Agency, International Transport Forum, and Nuclear Energy Agency. Organisation for Economic Co-operation and Development, Paris. Available at: <http://dx.doi.org/10.1787/9789264233294-en>.

Also see Chapter 5 in *Better Growth, Better Climate*.

³ The World Bank, 2015. *State and Trends of Carbon Pricing 2015*.

⁴ Lower oil prices have led to stronger calls from industry to increase fossil fuel production subsidies, e.g. in the UK.

⁵ See: G20, 2013. *G20 Leaders' Declaration*. St Petersburg, Russia, September. Available at: https://g20.org/wp-content/uploads/2014/12/Saint_Petersburg_Declaration_ENG_0.pdf.

See also: G20, 2014. *G20 Leaders' Communiqué*. Brisbane, Australia, 15–16 November. Available at: https://g20.org/wp-content/uploads/2014/12/brisbane_g20_leaders_summit_communique.pdf.

⁶ Chen, K. and Stanway, D., 2014. China completes pilot carbon market rollout, but take up uncertain. Reuters, 19 June. Available at: <http://www.reuters.com/article/2014/06/19/china-carbon-idINL4N0P00KL20140619>.

⁷ The White House, 2015. U.S.-China Joint Presidential Statement on Climate Change. Office of the Press Secretary. Available at: <https://www.whitehouse.gov/the-press-office/2015/09/25/us-china-joint-presidential-statement-climate-change>. [Accessed 06 October 2015].

⁸ ICAP, 2015. China to cap emissions from six sectors, ETS to launch 2016. *ICAP Quarterly – Global Trends in Emissions Trading*, Issue 5, 19 March. International Carbon Action Partnership. Available at: <https://icapcarbonaction.com/newsletter-archive/mailling/view/listid-0/maillingid-12/listtype-1#CH>.

⁹ Prices have fluctuated around KRW 8,640–10,100, with trading activity concentrated around the 12 January opening day. See: ICAP, 2015. Supply of allowances at center of attention in Korean ETS. *ICAP Quarterly – Global Trends in Emissions Trading*, Issue 5, 19 March. International Carbon Action Partnership. Available at: <https://icapcarbonaction.com/newsletter-archive/mailling/view/listid-0/maillingid-12/listtype-1#KR>.

¹⁰ Oliver, C., and Foy, H., 2015. EU carbon market reforms back on the table. *Financial Times*, 30 April. Available at: <http://www.ft.com/cms/s/0/f0244d5a-ef3b-11e4-a6d2-00144feab7de.html>.

¹¹ The World Bank, n.d. Pricing Carbon. Available at: <http://www.worldbank.org/en/programs/pricing-carbon> [accessed 19 May 2015].

¹² Galbraith, K., 2014. Climate Change Concerns Push Chile to Forefront of Carbon Tax Movement. *The New York Times*, 29 October. Available at: <http://www.nytimes.com/2014/10/30/business/international/climate-change-concerns-push-chile-to-forefront-of-carbon-tax-movement.html>.

¹³ The World Bank, 2015. *State and Trends of Carbon Pricing 2015*.

¹⁴ See, e.g., this 29 May 2015 letter to the Secretary of the United Nations Framework Convention on Climate Change (UNFCCC)

and the President of the Paris Climate Change Conference (COP21), signed by leaders of BG Group, BP, Eni, Royal Dutch Shell, Statoil and Total: <http://s08.static-shell.com/content/dam/shell-new/local/corporate/corporate/downloads/pdf/media/speeches/2015/letter-to-unfccc.pdf>.

15 Ahead of the UN Climate Summit in September 2014, 73 countries, 22 sub-national jurisdictions and more than 1,000 companies and investors expressed their support for a price on carbon. See: The World Bank, 2014. 73 Countries and Over 1,000 Businesses Speak Out in Support of a Price on Carbon. 22 September. Available at: <http://www.worldbank.org/en/news/feature/2014/09/22/governments-businesses-support-carbon-pricing>.

16 See: CDP, 2015. *Putting a price on risk: Carbon pricing in the Corporate World*.

17 Business & Climate Summit 2015. Business & Climate Summit conclusions: towards a low-carbon society. Press release, 21 May. Paris. Available at: <http://www.businessclimatesummit.com/wp-content/uploads/2015/05/Business-Climate-Summit-Press-release.pdf>.

18 Overcoming obstacles is discussed in detail in: Green Growth Knowledge Platform, 2015. *Overcoming Obstacles to Green Fiscal Reform*. GGKP Research Committee on Fiscal Instruments, Working Paper 02. Available at: http://www.greengrowthknowledge.org/sites/default/files/Withana_Overcoming_obstacles_to_green_fiscal_reform.pdf.

Sometimes these obstacles are too great to overcome, and there have been some notable withdrawals from explicit carbon pricing, including Australia in July 2014 and New Jersey in 2011.

19 Summers, L., 2015. Let this be the year when we put a proper price on carbon. *Financial Times*, 4 January. Available at: <http://www.ft.com/cms/s/2/10cb1a60-9277-11e4-a1fd-00144feabdc0.html#axzz3YaRK6RGM>.

20 Klevnäs, P., Stern, N. and Frejova, J., 2015. *Oil Prices and the New Climate Economy*. New Climate Economy briefing paper. Global Commission on the Economy and Climate and Stockholm Environment Institute, Stockholm. Available at: <http://static.newclimateeconomy.report/wp-content/uploads/2015/05/Oil-prices-and-the-New-Climate-Economy.pdf>.

21 G20, 2013. *G20 Leaders' Declaration*; and G20, 2014. *G20 Leaders' Communiqué*.

22 Greenhouse gases are a market failure or externality as the emitter does not bear the costs of this damage and disruption from their activities.

23 OECD, 2013. *Effective Carbon Prices*. Organisation for Economic Co-operation and Development, Paris. Available at: http://www.oecd-ilibrary.org/environment/effective-carbon-prices_9789264196964-en.

24 Rodi, M., Schlegelmilch, K. and Mehling, M., 2012. Designing environmental taxes in countries in transition: a case study of Vietnam. In: *Handbook of Research on Environmental Taxation*, J.E. Milne and M.S. Anderson (eds.). Edward Elgar Publishing Limited, Cheltenham, UK. Chapter 7, 122–138.

25 Platts, 2013. France adopts 2014 budget; carbon tax on fossil fuels. 19 December. Available at: <http://www.platts.com/latest-news/electric-power/london/france-adopts-2014-budget-carbon-tax-on-fossil-26563408>. The tax applied only to household heating fuels at first; it was extended to cover transport fuels in 2015, with an exemption for businesses covered by the EU ETS.

26 Parry, I.W.H., Heine, D., Lis, E. and Li, S., 2014. *Getting energy prices right: From principle to practice*. International Monetary Fund, Washington DC. Available at: <http://www.imf.org/external/pubs/cat/longres.aspx?sk=41345.0>.

27 OECD, 2013. *Taxing Energy Use: A Graphical Analysis*. Organisation for Economic Co-operation and Development, Paris. Available at: http://www.oecd-ilibrary.org/taxation/taxing-energy-use_9789264183933-en. (Note: an updated was released on 25 June 2015).

28 OECD, 2013. *Effective Carbon Prices*.

29 The World Bank, 2015. *The FASTER Principles for Successful Carbon Pricing: An Approach based on initial experience*. The World Bank Group, Washington, D.C. Available at: <http://documents.worldbank.org/curated/en/2015/09/25060584/faster-principles-successful-carbon-pricing-approach-based-initial-experience>.

FASTER refers to fairness, alignment with existing policies, stability, transparency, efficiency, and reliability.

30 The Market Stability Reserve adjusts auction volumes to ensure the total number of allowances in the market lies within a predefined range. If the surplus in the market is higher than the predefined threshold, allowances would be added to the reserve by reducing auction volumes in the future, and vice versa.

See: European Commission, 2014. Proposal for a Decision of the European Parliament and of the council concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC. Available at: http://ec.europa.eu/clima/policies/ets/reform/docs/com_2014_20_en.pdf.

³¹ The type of economy will also impact the effectiveness of carbon prices, i.e. their ability to change consumption and production behaviour of households and businesses. For example, in China, their emissions trading system pilot schemes interact with existing energy sector regulations, resulting in an inability of electricity generators to pass through permit prices to electricity users. In such cases, wider economic reform will be required to increase the effectiveness of explicit carbon pricing. Alternative policies may be required in the meantime, such as taxes on fuels, to ensure emissions are constrained.

³² OECD, 2015. *Aligning Policies for a Low-Carbon Economy*.

³³ Whitley, S. and van der Burg, L., 2015. *International Support to Fossil Fuel Subsidy Reform*. White Paper for the Global Commission on the Economy and Climate.

³⁴ Alleyne, T. et al., 2013. *Energy Subsidy Reform in Sub-Saharan Africa: Experiences and Lessons*. International Monetary Fund, Washington, DC. Available at: <http://www.imf.org/external/pubs/ft/dp/2013/afr1302.pdf>.

³⁵ This estimate reflects pre-tax subsidies. The IMF has calculated post-tax subsidies at around US\$4.9 trillion (6.5% of global GDP) in 2013 and projects they will reach US\$5.3 trillion in 2015. The large difference between pre- and post-tax subsidies largely reflects the local and global environmental damage from energy consumption. They estimate that eliminating post-tax subsidies in 2015 could raise government revenue by US\$2.9 trillion (3.6% of global GDP), cut global CO₂ emissions by more than 20%, and cut pre-mature air pollution deaths by more than half. After allowing for the higher energy costs faced by consumers, this action would raise global economic welfare by US\$1.8 trillion (2.2% of global GDP). These estimates, while they are rough approximations, give an idea of the benefits of getting prices right (both removing subsidies and pricing carbon).

See: Coady, D., Parry, I., Sears, L. and Shang, B., 2015. *How Large are Global Energy Subsidies?* IMF Working Paper, WP/15/105. International Monetary Fund, Washington, DC. Available at: <http://www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf>.

³⁶ IEA, 2014, *World Energy Outlook 2014*. International Energy Agency, Paris. Available at: <http://www.worldenergyoutlook.org/publications/weo-2014/>.

³⁷ This is the estimated annual range for 2005-2011. See: OECD, 2013. *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*. Organisation for Economic Co-operation and Development, Paris. Available at: <http://dx.doi.org/10.1787/9789264187610-en>.

The OECD has recently updated and expanded this estimate to include major emerging economies (Brazil, China, India, Indonesia, Russia and South Africa). The inventory includes almost 800 spending programmes and tax breaks used by governments, and it estimates total support at US\$ 160-200 billion annually. See: OECD, 2015. *OECD Companion to the Inventory of Support Measures for Fossil Fuels 2015*. Organisation for Economic Co-operation and Development, Paris. Available at: <http://dx.doi.org/10.1787/9789264239616-en>.

³⁸ Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.

³⁹ Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.

⁴⁰ IEA, 2014. *Africa Energy Outlook: A Focus on Energy Prospects in Sub-Saharan Africa*. World Energy Outlook Special Report. International Energy Agency, Paris. Available at: <http://www.worldenergyoutlook.org/publications/weo-2014/>.

⁴¹ Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.

⁴² There are also consumption subsidies that persist in developed countries. For example, the UK's lower Value Added Tax (VAT) rate on domestic energy use, which in the case of electricity lowers the effective carbon tax on household electricity consumption from £59 per tonne of CO₂e to £6. These types of subsidies that weaken the carbon price signal lower the incentive for households to switch their consumption patterns from currently high-carbon goods and services to lower-carbon alternatives. See: Advani, A., Bassi, S., Bowen, A., Frankhauser, S., Johnson, P., Leicester, A. and Stoye, G., 2014. *Energy use policies and carbon pricing in the UK*. IFS Report R84. Institute for Fiscal Studies, London. Available at: <http://www.ifs.org.uk/comms/r84.pdf>.

⁴³ HM Treasury, 2014. Radical reforms for oil and gas industry. News story, 4 December. Government of the United Kingdom, London. Available at: <https://www.gov.uk/government/news/radical-reforms-for-oil-and-gas-industry>.

- 44 The material in this box is drawn from Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.
- 45 The World Bank, 2014. *Transitional Policies to Assist the Poor While Phasing Out Inefficient Fossil Fuel Subsidies that Encourage Wasteful Consumption*. Contribution by the World Bank to G20 Finance Ministers and Central Bank Governors, September. Available at: <http://www.oecd.org/site/tadffss/reports-to-g20-fossil-fuel-subsidies.htm>.
- 46 IMF, 2013. *Energy Subsidy Reform: Lessons and Implications*. International Monetary Fund, Washington, DC. Available at: <http://www.imf.org/external/np/pp/eng/2013/012813.pdf>.
- 47 See: Durand-Lasserve, O., Campagnolo, L., Chateau, J. and Dellink, R., 2015. *Modelling of Distributional Impacts of Energy Subsidy Reforms: An Illustration with Indonesia*. OECD Environment Working Paper No. 86. Organisation for Economic Co-operation and Development, Paris. Available at: <http://dx.doi.org/10.1787/5js4k0scrq5-en>.
- 48 Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.
- 49 Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.
- 50 GIZ, 2011. *Fuel Price Reform in Bolivia*. German Agency for International Co-operation, Eschborn. Available at: <http://www.giz.de/expertise/downloads/Fachexpertise/giz2011-en-fuel-price-reform-bolivia-december-2010.pdf>.
- 51 IMF, 2013. *Energy Subsidy Reform: Lessons and Implications*.
- 52 Whitley and van der Burg, 2015. *International Support to Fossil Fuel Subsidy Reform*.
- 53 There is also the risk that reforms are reversed if energy prices rise again in the future. To ensure pressure to reverse reforms is lessened, reforms need to promote structural change to reduce reliance on fuels, including shifting tax structures to reduce the impact of a rise in fuel prices on budgets.
- 54 See the Global Action Plan and Chapter 8 in *Better Growth, Better Climate*.
- 55 Fairfield, H., 2014. Best of Both Worlds? Northeast Cut Emissions and Enjoyed Growth. *The New York Times*, 6 June. The Upshot. Available at: <http://www.nytimes.com/2014/06/06/upshot/best-of-both-worlds-northeast-cut-emissions-and-enjoyed-growth.html>.

The point of this comparison is to show that the sharp cut in emissions in the RGGI states did not prevent these economies from doing just as well as elsewhere, as measured by GDP. The author acknowledges the limitations of this static comparison. For example, it is possible that the nine states that joined the cap-and-trade programme would have had even higher economic growth without the programme or that many of the benefits from these sharp emissions cuts may not be reflected in GDP estimates.

- 56 Hibbard, P.J., Okie, A.M., Tierney, S.F. and Darling, P.G., 2015. *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States*. Review of RGGI's Second Three-Year Compliance Period (2012-2014). Analysis Group. Available at: http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_july_2015.pdf.
- 57 At the Third Annual Conference of the Green Growth Knowledge Platform (GGKP), "Fiscal Policies and the Green Economy Transition: Generating Knowledge – Creating Impact", several papers were presented on the role of fiscal instruments such as carbon prices in the transition to a low-carbon economy, including case studies from developed and developing economies. See: <http://www.greengrowthknowledge.org/event/conference2015>.
- 58 See Part II, Enabling a low-carbon transition: prices and more, in: Fay, M., Hallegatte, S., Vogt-Schilb, A., Rozenberg, J., Narloch, U., and Kerr, T., 2015. *Decarbonizing Development: Three Steps to a Zero-Carbon Future*. The World Bank, Washington, DC. Available at: <http://hdl.handle.net/10986/21842>.
- 59 This opportunity for growth enhancing fiscal reform is lost if greenhouse gas emissions are reduced through other policies such as regulations.
- 60 See Part II in Fay et al., 2015. *Decarbonizing Development*.
- 61 Fay et al., 2015. *Decarbonizing Development*.
- 62 European Commission, n.d. Auctioning. Available at: http://ec.europa.eu/clima/policies/ets/cap/auctioning/index_en.htm [accessed 19 May 2015].
- 63 Beyond explicit carbon prices, recent analysis by the OECD shows that taxes on energy are not uniformly regressive. Taxes on transport fuels are often progressive, especially in low-income countries. In contrast, increases in taxes on heating fuels and electricity are generally regressive when not accompanied with appropriate compensation measures. See: Flues, F. and Thomas, A., 2015. *The Distributional Effects of Energy Taxes*. OECD Taxation Working Paper, No. 23. Organisation for Economic Co-operation and

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⁶⁴ Lindmark, M., Bergquist, A-K. and Andersson, L.F., 2011. Energy transition, carbon dioxide reduction and output growth in the Swedish pulp and paper industry: 1973–2006. *Energy Policy*, 39(9). 5449–5456. DOI: 10.1016/j.enpol.2011.05.018.

⁶⁵ Hallegatte, S., Fay, M. and Vogt-Schilb, A., 2013. *Green Industrial Policies: When and How*. Policy Research Working Paper No. WPS6677. The World Bank, Washington, DC. Available at: <http://dx.doi.org/10.1596/1813-9450-6677>.

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⁶⁶ OECD, 2013. *Germany: Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels – 2013*. Organisation for Economic Co-operation and Development, Paris. Available at: <http://www.oecd.org/site/tadffss/DEU.pdf>.

⁶⁷ See Part III: Managing the transition: Protecting the poor and avoiding the potential pitfalls of reforms, in Fay et al., 2015. *Decarbonizing Development*.

⁶⁸ Combining carbon pricing with local measures, such as local pollution taxes or relocation of heavy industry away from population centres, is often the most cost-effective way to achieve these local benefits.

⁶⁹ WHO, 2014. 7 million premature deaths annually linked to air pollution. World Health Organization news release, 25 March. Available at: <http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>.

⁷⁰ See Chapter 1 in *Better Growth, Better Climate*.

⁷¹ Importing clean energy technologies to replace reliance on imported fossil fuels may not see a shift in the trade balance in the short-term. See Chapter 1 and Chapter 5, Box 3 in *Better Growth, Better Climate*.

⁷² Except as noted, all prices given here are as of 1 April 2015, as reported in Figure 3 in: The World Bank, 2015. *Carbon Pricing Watch 2015: An advance brief from the State and Trends of Carbon Pricing 2015* report, to be released late 2015. Washington DC. Available at: <http://documents.worldbank.org/curated/en/2015/05/24528977/carbon-pricing-watch-2015-advance-brief-state-trends-carbon-pricing-2015-report-released-late-2015>.

⁷³ IEA, 2014. *World Energy Investment Outlook: Special Report*. International Energy Agency, Paris. Available at: <http://www.iea.org/publications/freepublications/publication/WEIO2014.pdf>.

⁷⁴ The starting rate is set at R120 (about US\$9.60), but there are several allowances, including a 60% free threshold. See: Parker, M. and Gilder, A., 2015. South Africa announces timelines for the introduction of the carbon tax. ENSAfrica blog, 22 April. Available at: <https://www.ensafrika.com/news/South-Africa-announces-timelines-for-the-introduction-of-the-carbon-tax?Id=1776&STitle=tax%20ENSight>.

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⁷⁵ See: Szabo, M., 2015. France passes sweeping energy bill, to raise CO2 tax to €100/t by 2030. *Carbon Pulse*, 22 July. Available at: <http://carbon-pulse.com/france-set-to-pass-sweeping-energy-bill/>

⁷⁶ The World Bank, 2015. *State and Trends of Carbon Pricing 2015*.

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⁷⁸ CDP, 2015. *Putting a price on risk: Carbon pricing in the Corporate World*.

⁷⁹ CDP, 2015. *Putting a price on risk: Carbon pricing in the Corporate World*.

⁸⁰ Chateau, J., Saint-Martin, A. and Manfredi, T., 2011. *Employment Impacts of Climate Change Mitigation Policies in OECD: A General-Equilibrium Perspective*. OECD Environment Working Paper No. 32. Organisation for Economic Co-operation and Development, Paris.

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⁸² Bento, A. and Jacobsen, M., 2007. Ricardian rents, environmental policy and the “double-dividend” hypothesis. *Journal of Environmental Economics and Management*, 53(1). 17–31. DOI:10.1016/j.jeem.2006.03.006.

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⁸³ For example, a recent literature review shows that papers evaluating the ex post evidence of the competitiveness impacts of carbon taxes find significant decreases in energy intensity, but only small impacts on competitiveness, if any. See: Arlinghaus, A., 2015. *Impact of Carbon Prices on Indicators of Competitiveness: A Review of Empirical Findings*. OECD Environment Working Paper No. 87. Organisation for Economic Co-operation and Development, Paris. Available at: http://www.oecd-ilibrary.org/environment/oecd-environment-working-papers_19970900;jsessionid=266o5ev2w84c8.x-oecd-live-03.

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⁸⁴ An EU carbon price of around €50/tCO₂ would only have a minor impact on trade flows. See: Sato, M. and Dechezleprêtre, A., 2015. *Asymmetric Industrial Energy Prices and International Trade*. Centre for Climate Change Economics and Policy Working Paper No. 202; Grantham Research Institute on Climate Change and the Environment, Working Paper No. 178. Available at: <http://www.lse.ac.uk/GranthamInstitute/publication/asymmetric-industrial-energy-prices-and-international-trade/>.

⁸⁵ For analytical case studies across several EU industries detailing the potential for carbon leakage, see: Vivideconomics, 2014. *Case Studies*. Final Report. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/318895/case_studies_for_sectors_investigated_in_detail_vivid_economics.pdf.

⁸⁶ The World Bank, 2015. *State and Trends of Carbon Pricing 2015*.

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⁹³ See: <http://www.carbonpricingleadership.org>.

⁹⁴ The World Bank, 2015. *The FASTER Principles for Successful Carbon Pricing: An Approach based on initial experience*.

⁹⁵ See: <http://www.thepmr.org/content/supporting-action-climate-change-mitigation>.

⁹⁶ See: <https://icapcarbonaction.com>. It should be noted that cooperation and knowledge-sharing needs to go beyond the government level. International cooperation between businesses and business organisations, between consumers and consumer organisations, and between international labour organisations will further accelerate action.

⁹⁷ Parry and colleagues argue that because multiple benefits vary substantially across countries, it might be more efficient to have differentiated prices by country or region. See: Parry, I., Veung, C. and Heine, D., 2014. *How Much Carbon Pricing in Countries' Own Interests? The Critical Role of Co-Benefits*. IMF Working Paper prepared, in part, as a contribution to the New Climate Economy project. International Monetary Fund, Washington, DC. Available at: <https://www.imf.org/external/pubs/cat/longres.aspx?sk=41924.0>.

⁹⁸ Instruments could vary from cap-and trade and explicit taxes to adjustments to fuel taxes, regulatory requirements and standards.

⁹⁹ Such a bottom-up approach to carbon pricing may have some benefits, including overcoming the "prisoner's dilemma" problem. See <http://carbon-price.com> for a discussion of these issues.

¹⁰⁰ Bodansky, D., Hoedl, S., Metcalf, G.E. and Stavins, R., 2014. *Facilitating Linkage of Heterogeneous Regional, National, and Sub-National Climate Policies through a Future International Agreement*. Harvard Project on Climate Agreements Discussion Paper Series. Harvard University, Cambridge, MA, US. Available at: http://belfercenter.ksg.harvard.edu/publication/24568/facilitating_linkage_of_heterogeneous_regional_national_and_subnational_climate_policies_through_a_future_international_agreement.html.

Also see: The World Bank, n.d. Networked Carbon Markets Initiative. Available at: <http://www.worldbank.org/en/topic/climatechange/brief/globally-networked-carbon-markets> [accessed 29 September 2015].

In May 2015, the International Centre for Trade and Sustainable Development (ICTSD) and OECD hosted a high-level policy dialogue in Paris on the need to create a "club" of carbon markets that can establish a basis for future international linkages.

¹⁰¹ Lanzi, E., Mullaly, D., Chateau, J. and Dellink, R., 2013. *Addressing Competitiveness and Carbon Leakage Impacts Arising from Multiple Carbon Markets: A Modelling Assessment*. OECD Environment Working Paper No. 58. Organisation for Economic Co-operation and Development, Paris. Available at: <http://dx.doi.org/10.1787/5k40ggjj7z8v-en>.

¹⁰² Carbon Market Watch Report, 2015. *Towards a Global Carbon Market: Prospects for Linking the EU ETS to Other Carbon Markets*. May. Available at: http://carbonmarketwatch.org/wp-content/uploads/2015/05/NC-Towards-a-global-carbon-market-report_web.pdf.

¹⁰³ See: Doda, B. and Taschini, L., 2015. *Carbon Dating: When is it Beneficial to Link ETSs?* Grantham Research Institute, London School of Economics and Political Science. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2610076.

¹⁰⁴ Bodansky et al., 2014. *Facilitating Linkage of Heterogeneous Regional, National, and Sub-National Climate Policies*.

¹⁰⁵ Carbon Market Watch Report, 2015. *Towards a Global Carbon Market*.

¹⁰⁶ See: <http://www.rggi.org>.

¹⁰⁷ The *FASTER Principles for Successful Carbon Pricing*, based on lessons from existing experiences of carbon pricing, can help to guide such a commitment. See: The World Bank, 2015. *The FASTER Principles for Successful Carbon Pricing*.

¹⁰⁸ The practical introduction of carbon pricing should be led by finance ministries, and supported by all other relevant areas of government. In practice, they will be responsible for administering the policy and making sure revenues are put to good use. This will include ensuring the necessary policy integration and alignment. Finance and other relevant ministers will need to convene meetings to discuss and agree these practicalities.

¹⁰⁹ However, the specific mitigation impact of carbon pricing is subject to considerable uncertainty, as carbon prices have significant economy-wide impact. Also, detailed, robust and reliable models on the impact of carbon pricing are not yet available, leaving the estimate for the overlap of carbon prices with other policy measures subject to significant uncertainty. For further details on these estimates see: New Climate Economy, 2015. *Estimates of Emissions Reduction Potential for the 2015 Report: Technical Note. A technical note for Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate*. Available at: <http://newclimateeconomy.report/misc/working-papers>.

ABOUT THE NEW CLIMATE ECONOMY

The Global Commission on the Economy and Climate, and its flagship project The New Climate Economy, were set up to help governments, businesses and society make better-informed decisions on how to achieve economic prosperity and development while also addressing climate change.

In September 2014, the Commission published *Better Growth, Better Climate: The New Climate Economy Report*. Since then, the project has released a series of country reports on the United States, China, India and Ethiopia, and sector reports on cities, land use, energy and finance. In July 2015, the Commission published *Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate*. It has disseminated its messages by engaging with heads of governments, finance ministers, business leaders and other key economic decision-makers in over 30 countries around the world.

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