

# CARBON PRICING WATCH 2016

An advance brief from the State and Trends of Carbon Pricing 2016 report, to be released late 2016

## At a glance – accord in Paris, China ETS on the horizon

2015 witnessed an historic global step forward in taking action on climate change. World leaders reached an agreement on December 12, 2015 at the 21<sup>st</sup> Conference of the Parties (COP 21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris to keep the global average temperature increase well below 2°C and pursue efforts to hold the increase to 1.5°C.<sup>1</sup> On April 22, 2016, at a special ceremony in New York, about 90% of the Parties to the UNFCCC signed the Paris Agreement,<sup>a</sup> and 15 Parties deposited their instruments of ratification.<sup>2,b</sup> This agreement could not be more timely, as 2015 marked the warmest year since records began in 1880.<sup>3</sup>

As of May 1, 2016, 162 intended nationally determined contributions (INDCs), representing 190 Parties, had been submitted to the UNFCCC. These INDCs outline the intended national efforts toward reducing greenhouse gas (GHG) emissions and climate resilient development under the Paris Agreement. More than 90 of the submitted INDCs include proposals for emission trading systems (ETs), carbon taxes and other carbon pricing initiatives.<sup>4</sup> Parties stating in their INDCs that they are planning or considering the use of domestic or international market mechanisms<sup>c</sup> account for 61 percent of global GHG emissions. Most of these Parties request financial and technological support through international carbon markets. Among the Parties planning or considering the use of market mechanisms are three of the world's five largest emitters.<sup>d</sup>

<sup>a</sup> 175 Parties (174 countries and the European Union) signed the Paris Agreement at the special ceremony on April 22, 2016.

<sup>b</sup> The Agreement will remain open for signature until April 21, 2017. See details in the section "International carbon pricing update" below.

<sup>c</sup> Including Reducing Emissions from Deforestation and Forest Degradation and sustainable forest management, conservation of forests, and enhancement of carbon sinks (REDD+) mechanism.

<sup>d</sup> China, India and Brazil. The other two Parties, the US and the EU, did not state the use of market mechanisms in their INDC, despite carbon pricing initiatives already being implemented at a regional, national and/or subnational level.

Ahead of the COP in Paris, an unprecedented alliance of Heads of State, city and state leaders, with the support of heads of leading companies, joined forces to urge countries and companies to put a price on carbon.<sup>5</sup> In addition, Paris saw the launch of the Carbon Pricing Leadership Coalition (CPLC).<sup>6</sup> The CPLC brings together governments, business and non-government organizations (NGOs) that seek to take action to accelerate the global uptake of carbon pricing.<sup>e</sup>

The launch of the G7 Carbon Market Platform<sup>7</sup> and the New Zealand-led declaration on carbon markets<sup>8</sup> during COP 21 also recognize the importance of carbon pricing initiatives in reducing GHG emissions. Furthermore, the global aviation sector may implement an international carbon offsetting mechanism in 2021, details of which are expected to be approved later this year. These initiatives all underscore the growing momentum for countries to voluntarily embrace carbon pricing to mitigate climate change and build climate resilience.

In 2016, about 40 national jurisdictions and over 20 cities, states, and regions, including seven out of the world's ten largest economies,<sup>f</sup> are putting a price on carbon, as displayed in Figure 1. These jurisdictions are responsible for almost a quarter of global GHG emissions.<sup>9</sup> On average, carbon pricing initiatives cover about half of the emissions in these jurisdictions. This translates to about 7 gigatons of carbon dioxide equivalent (GtCO<sub>2</sub>e) or about 13 percent of global GHG emissions, as displayed in Figure 2. This figure represents a threefold increase over the past decade.<sup>h</sup>

<sup>e</sup> The Carbon Pricing Leadership Coalition (CPLC) is a voluntary partnership of governments, businesses, and civil society organizations that works to catalyze action toward the successful design and implementation of carbon pricing initiatives around the world, helping maintain competitiveness, create jobs, encourage innovation, and achieve meaningful emissions reductions. Launched in 2015 at COP 21, the Coalition brings together leaders from government and business to build the evidence base for successful carbon pricing; to mobilize business support; and to have constructive dialogues, country by country, about how to advance effective carbon pricing. 25 governments and over 100 leading businesses and strategic partners have thus far joined the CPLC to contribute to these efforts.

<sup>f</sup> The seven economies are the United States, China, Japan, Germany, UK, France and Italy. Carbon pricing initiatives are implemented at a subnational level in the United States and China. The world's largest economies were determined using the World Bank's gross domestic product data for 2014.

<sup>9</sup> Figures as of May 1, 2016. For the purpose of the Carbon Pricing Watch, carbon pricing refers to initiatives that put an explicit price on GHG emissions. Carbon prices are therefore expressed as a value per ton of CO<sub>2</sub>e.

<sup>h</sup> In 2006, carbon pricing initiatives covered 4 percent of annual global GHG emissions; in 2016, this figure stands at 13 percent.

Since 2015, four new carbon pricing initiatives have been implemented or scheduled for implementation:

- The Republic of Korea ETS started on January 1, 2015;
- The Portugal carbon tax entered into force on January 1, 2015, covering all energy products used in non-EU ETS sectors;<sup>i</sup>
- On January 1, 2016, British Columbia launched an ETS that will cover the liquefied natural gas (LNG) facilities that are currently under construction, once they become operational;
- Australia is back on the carbon pricing map with the introduction of a safeguard mechanism to limit and price emissions on July 1, 2016. This establishes a new ETS, following the abolishment of the Australian Carbon Pricing Mechanism in 2014.

A major step forward for carbon pricing took place in 2015 with China developing its plans for a national ETS. The Chinese President Xi Jinping announced in September 2015<sup>j</sup> that the national ETS will commence in 2017.<sup>9</sup> Early unofficial estimates show that following this launch, about half of global GHG emissions will be generated by jurisdictions that are putting a price on carbon.<sup>k</sup> Furthermore, emissions covered by carbon pricing initiatives are estimated to almost double from 13 percent to about 25 percent of global GHG emissions, as illustrated in Figures 2 and 4.

<sup>i</sup> For further details on the Republic of Korea ETS and Portugal carbon tax, please refer to Kossoy et al., *State and Trends of Carbon Pricing*, September 2015.

<sup>j</sup> This announcement was made on September 25, 2015 as part of the "United States (US)-China Joint Presidential Statement on Climate Change."

<sup>k</sup> The authors estimate that the emissions to be covered under the Chinese national ETS will be about half of China's national GHG emissions, based on the sector scope, as stated in the "US-China Joint Presidential Statement on Climate Change" and public emissions data from the International Energy Agency. Others informed researchers have judged that the GHG emissions coverage will be about 40-60% of China's total GHG emissions. These estimates have not been validated by Chinese authorities.

In addition, Mexico announced the framework for a registry of national emissions that, together with other existing policies, will allow the implementation of a national carbon market starting in 2018. Canada is exploring options for carbon pricing on a national level. Manitoba, Ontario and Québec signed a memorandum of understanding that stated their intention to link their ETSs under the Western Climate Initiative. Alberta is planning to transition to an economy-wide carbon pricing system from January 1, 2017. At the same time, initiatives in South Africa and Kazakhstan have experienced setbacks over the past year.<sup>1</sup>

In 2015, governments raised about US\$26 billion in revenues from carbon pricing initiatives.<sup>m</sup> This represents a 60% increase compared to the revenues raised in 2014, which was estimated to be about US\$16 billion. As shown in Figure 3, the observed carbon prices span a wide range from less than US\$1/tCO<sub>2</sub>e to US\$137/tCO<sub>2</sub>e. About three quarters of the covered emissions are priced at less than US\$10/tCO<sub>2</sub>e. The total value of ETSs and carbon taxes in 2016 is just below US\$50 billion, similar to the value reported in the *State and Trends of Carbon Pricing 2015*.<sup>n</sup> This relative stability is due to increases in various carbon tax rates being offset by the temporary suspension of the Kazakhstan ETS and

lower carbon prices in most ETSs. If the Chinese national ETS is implemented, early unofficial estimates suggest that the total value of ETSs and carbon taxes could potentially double to about US\$100 billion.<sup>o</sup>

Over 1,000 companies reported to CDP in 2015 that they are currently using an internal price on carbon or plan to do so within the next two years.<sup>10</sup> Of these companies, 435 disclosed the use of internal carbon pricing in 2015—almost triple the number compared to 2014.<sup>11</sup> The largest increases came from companies located in emerging markets—particularly Africa and Asia. On April 22, 2016, the United Nations Global Compact (UNGC) called for a minimum internal carbon price level of US\$100/tCO<sub>2</sub>e by 2020 in order to be consistent with a 1.5–2°C pathway.<sup>12</sup> The corporate carbon price range reported to CDP in 2015 spans from US\$1/tCO<sub>2</sub>e to US\$357/tCO<sub>2</sub>e,<sup>13</sup> and six companies have disclosed that they are using price levels that are consistent with the UNGC recommendation.

Looking ahead, the implementation of the Paris Agreement could enable jurisdictions to expand their carbon pricing initiatives and facilitate cooperation. The alignment of domestic and international carbon pricing initiatives with other domestic-level climate mitigation actions will be a key priority. To continue to build momentum, the High Level Panel on Carbon Pricing, a group of government leaders and international organizations, set forward a global target to double the emissions covered by carbon pricing initiatives to 25 percent by 2020 and to double this coverage again within a decade.<sup>14</sup>

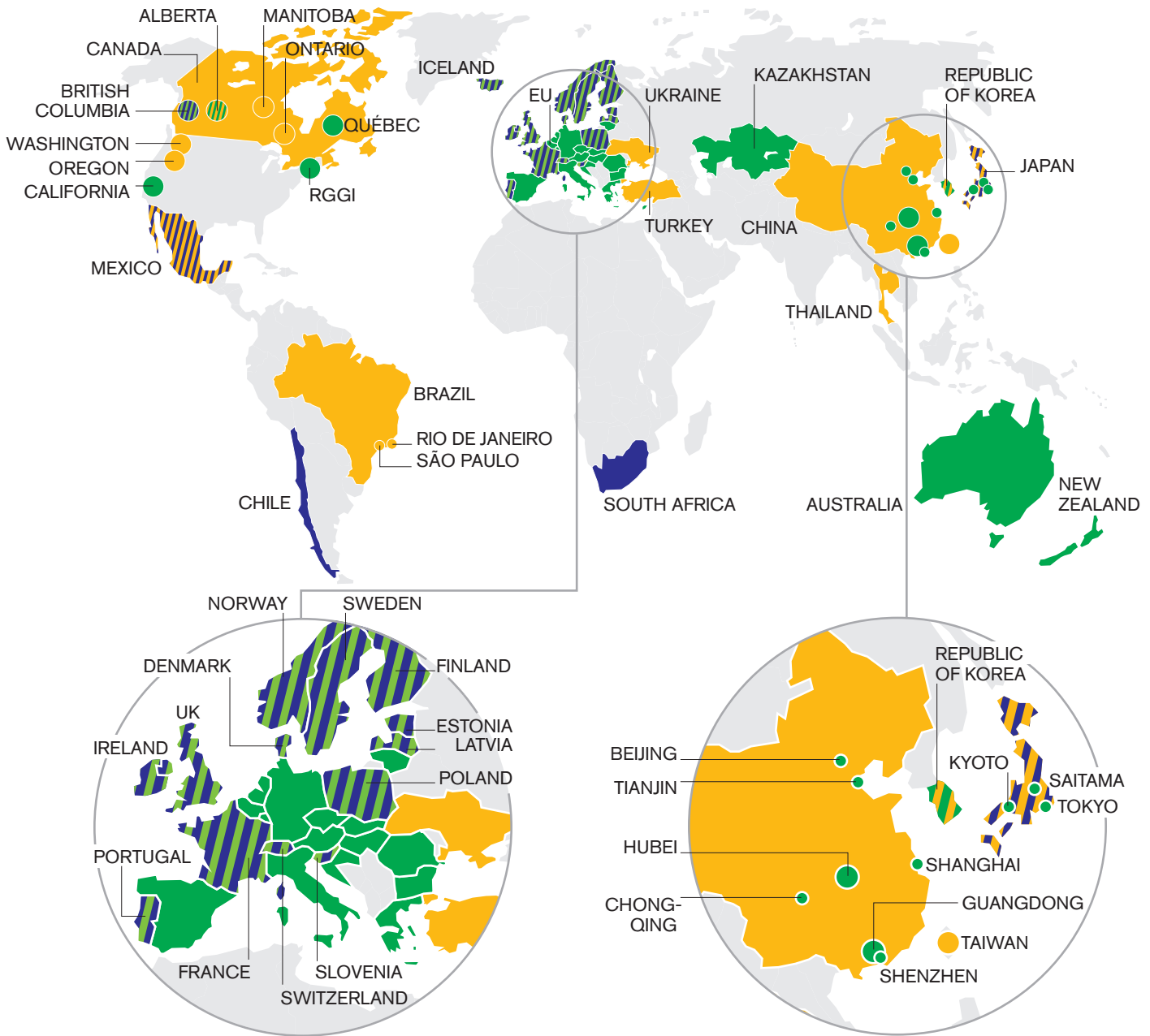
<sup>1</sup> South Africa has delayed its carbon tax for another year and Kazakhstan has temporarily suspended its ETS.

<sup>m</sup> Authors' calculations, based on auction revenue reports of the different ETSs, payments into Alberta's Climate Change and Management Fund, and the annual budget of governments with carbon taxes in place.

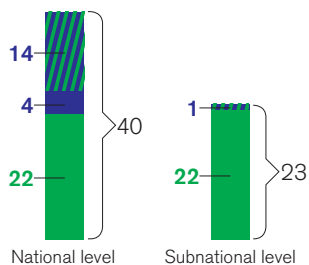
<sup>n</sup> The total value of the ETS markets was estimated by multiplying each ETS's annual allowance volume for 2016, or the most recent yearly volume data, with the allowance price on April 1, 2016. The total value for carbon taxes was derived from official government budgets for 2016. Where the allowance volume (for an ETS) or budget information (for a carbon tax) was unavailable, the value of the carbon pricing initiative was calculated by multiplying the GHG emissions covered with the nominal carbon price on April 1, 2016. No information was available on the amount of emission reduction credits which could be generated under the Australian safeguard mechanism; therefore, this was not included in the value calculation.

<sup>o</sup> The value was estimated based on the approximate emissions covered under the Chinese national ETS multiplied by the weighted average carbon price over all carbon pricing initiatives globally in 2016. This estimate has not been validated by Chinese authorities and is not based on official sources.

Figure 1. Summary map of existing, emerging and potential regional, national and subnational carbon pricing initiatives (ETS and tax)



Tally of carbon pricing initiatives

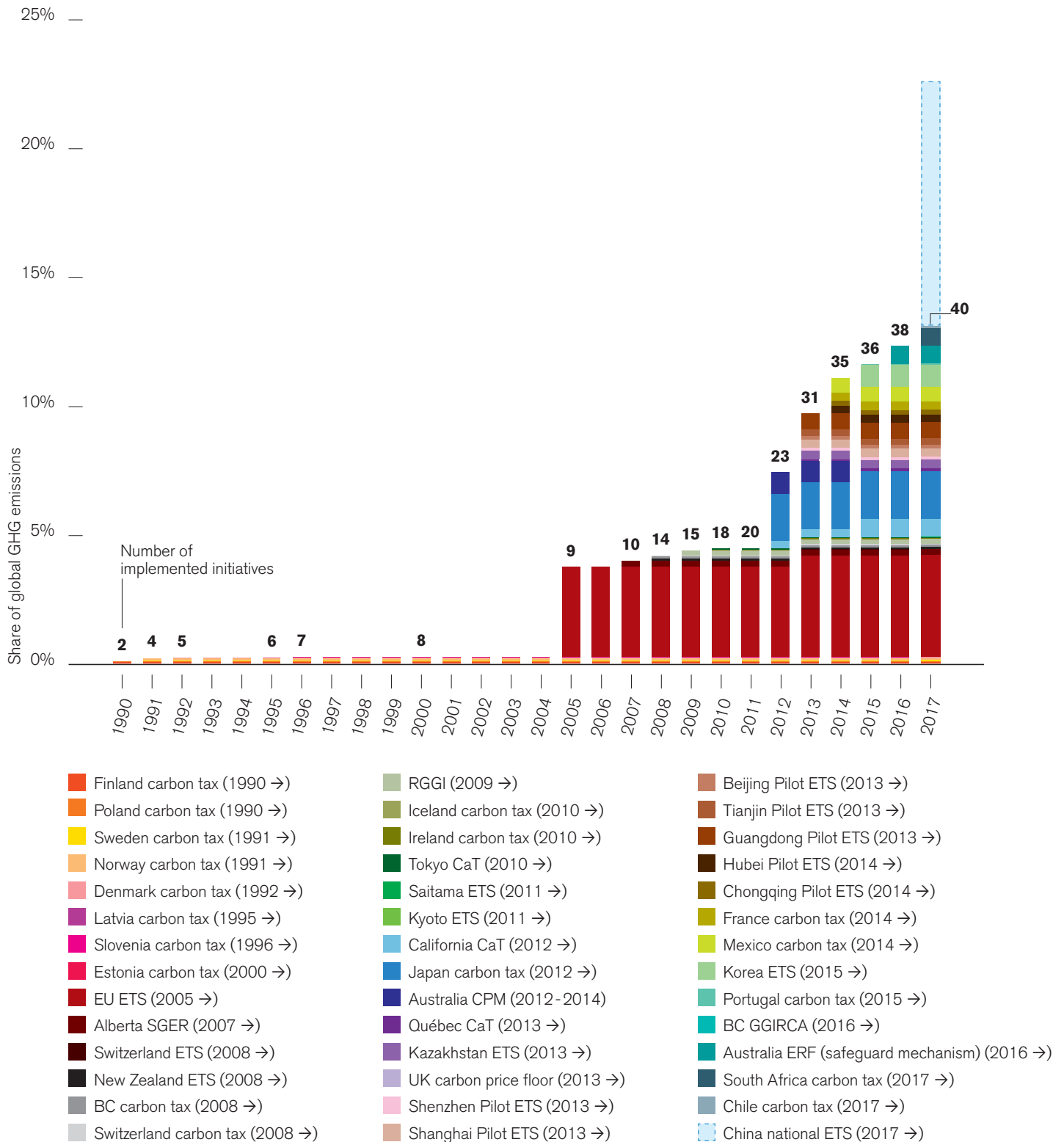


- ETS implemented or scheduled for implementation
- Carbon tax implemented or scheduled for implementation
- ETS or carbon tax under consideration
- ETS and carbon tax implemented or scheduled
- ETS implemented or scheduled, tax under consideration
- Carbon tax implemented or scheduled, ETS under consideration

The circles represent subnational jurisdictions. The circles are not representative of the size of the carbon pricing instrument, but show the subnational regions (large circles) and cities (small circles).

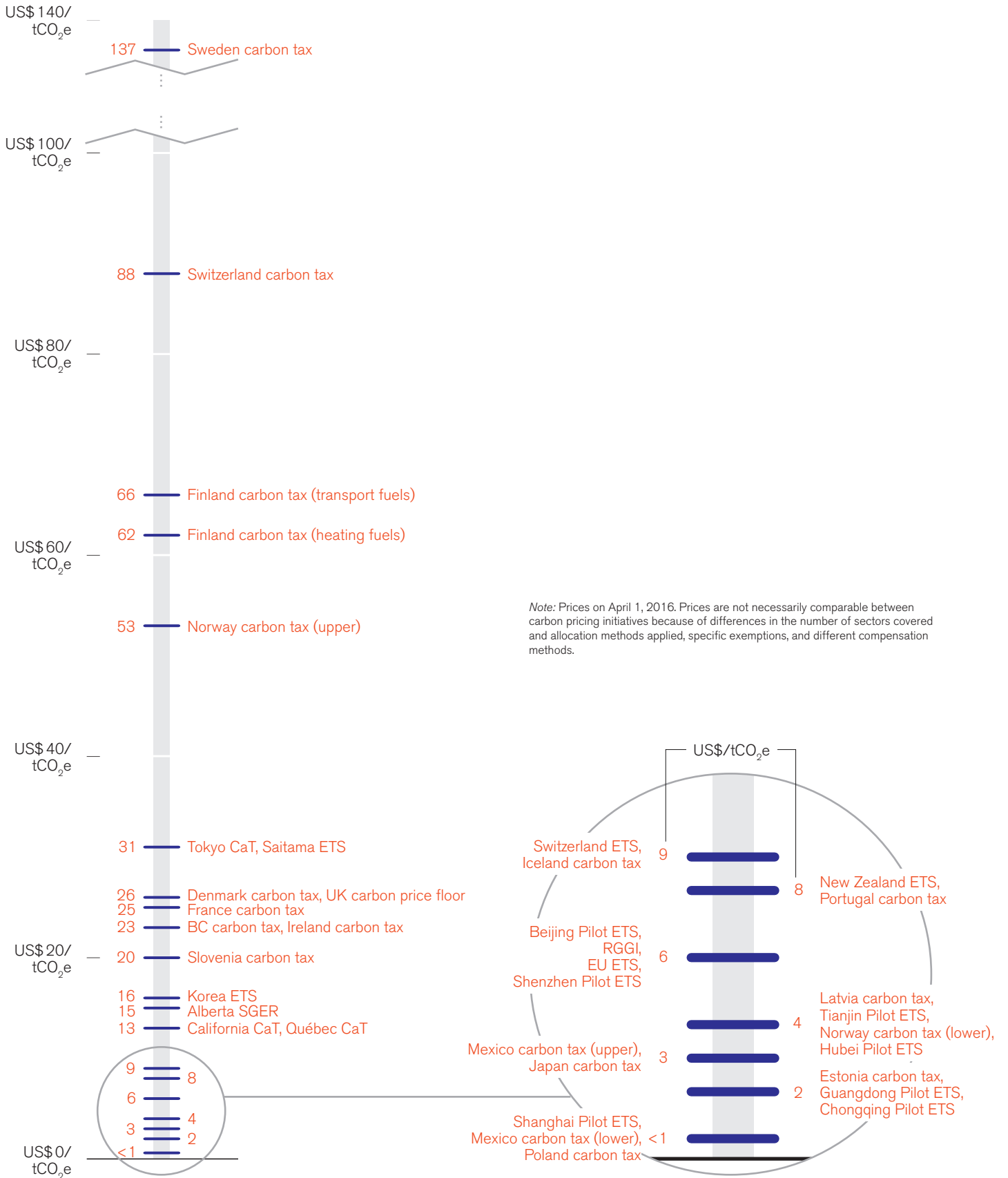
Note: Carbon pricing initiatives are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date.

Figure 2. Regional, national and subnational carbon pricing initiatives: share of global emissions covered



Note: Only the introduction or removal of an ETS or carbon tax is shown. Emissions are given as a share of global GHG emissions in 2012. Annual changes in global, regional, national, and subnational GHG emissions are not shown in the graph. Data on the coverage of the city-level Kyoto ETS were not accessible and the British Columbia Greenhouse Gas Industrial Reporting and Control Act (GGIRCA) does not cover any emissions yet; their coverages are therefore shown as zero. The information on the Chinese national ETS represents early unofficial estimates based on the Chinese President's announcement in September 2015.

Figure 3. Prices in existing carbon pricing initiatives





## International carbon pricing update

### The Paris Agreement and INDCs

As of May 1, 2016, 177 Parties have signed the Agreement, and 16 Parties have deposited their instruments for ratification.<sup>15</sup> The Agreement will remain open for signature until April 21, 2017. Any Party to the UNFCCC that has not signed the Agreement by then may deposit its instrument of accession after that date. A Party to the UNFCCC that has signed the Agreement may deposit its instrument of ratification, acceptance or approval following signature. The Agreement will enter into force when it has been ratified by at least 55 Parties to the UNFCCC that collectively account for at least 55 percent of global GHG emissions. Once the Agreement enters into force, its provisions will become legally binding on those Parties who have ratified it and its operation will be governed by the COP serving as the meeting of the Parties to the Paris Agreement.

INDCs were requested by the COP as part of laying the groundswell for the adoption of the Agreement. Of the 162 submitted INDCs,<sup>p</sup> more than 90 include proposals for ETSs, carbon taxes and other carbon pricing initiatives.<sup>16</sup> Parties stating in their INDCs that they are planning or considering the use of domestic or international market mechanisms<sup>q</sup> account for 61 percent of global GHG emissions. More specifically, five INDCs mention the use of domestic market mechanisms only, representing almost a quarter of the global emissions. Also, 96 INDCs state intentions to use international market mechanisms only; the Parties that submitted these INDCs account for about a third of the global emissions. Some INDCs also state that their pledged mitigation is dependent on the availability of market mechanisms on a bilateral, regional or international scale.<sup>17</sup>

Carbon pricing is mentioned in paragraph 137 of the COP decision, which recognises the “important role of providing incentives for emission reduction activities, including tools such as domestic policies and carbon pricing.”

Article 6 of the Paris Agreement is particularly relevant for carbon markets. Article 6.1 recognizes that Parties can voluntarily cooperate in the implementation of their nationally determined contributions (NDCs)<sup>r</sup> to allow for higher ambition in mitigation and adaptation actions. Articles 6.2 to 6.7 introduce instances of such cooperative approaches.

Articles 6.2–6.3 cover cooperative approaches where Parties meet their NDCs by transferring mitigation outcomes internationally. Such transfers should be voluntary, promote sustainable development, and ensure environmental integrity. They should also follow accounting principles approved by the COP to avoid double-counting. The nature of the internationally transferred mitigation outcomes (ITMOs) has not yet been defined. ITMOs might cover outcomes from various existing and future market-based approaches, e.g., European Union Allowances (EUAs), credits from the Japanese Joint Crediting Mechanism, REDD+ credits, or mitigation outcomes issued from the new mechanism established under Article 6.4. Articles 6.2-6.3 thereby provide a basis for facilitating international recognition of cross-border applications of subnational, national, regional and international carbon pricing initiatives.

Articles 6.4-6.7 establish a mechanism for countries to contribute to GHG emissions mitigation and sustainable development. This new mechanism is under the authority and guidance of the COP serving as the meeting of the Parties to the Paris Agreement. It is open to all countries and the emission reductions can be used to meet the NDC of either the host country or another country. The mechanism is intended to incentivize mitigation activities by both public and private entities. It will go beyond offsetting, as it aims to deliver overall mitigation through voluntary contributions in a way that is yet to be clarified. A share of the proceeds from activities under the new mechanism will be used to cover administrative expenses. In addition, some of the proceeds will be disbursed to support the adaptation needs of developing countries that are particularly vulnerable to the adverse effects of climate change. The Subsidiary Body for Scientific and Technological Advice will work on the rules, modalities and procedures for this mechanism.

<sup>p</sup> Number of INDCs submitted as of May 1, 2016. EU-28 countries submitted a joint INDC on March 23, 2015.

<sup>q</sup> Including a Reducing Emissions from Deforestation and Forest Degradation and sustainable forest management, conservation of forests, and enhancement of carbon sinks (REDD+) mechanism.

<sup>r</sup> INDCs vs. NDCs: INDCs are voluntary statements which were invited by the COP without prescription related to form. NDCs are legally distinct and will be under the Agreement as and when it enters into force. They will be governed in the main by Article 4 of the Agreement. Each Party to UNFCCC who wishes to become a Party to the Agreement will have an obligation to communicate an NDC. The level of prescription attached to these will be determined by the negotiations of the operative elements of Article 4, which mainly take place under the Ad Hoc Working Group on the Paris Agreement.

## Clean Development Mechanism and Joint Implementation

International demand for Kyoto credits—Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs)—is almost exhausted. The European Union (EU), which was the biggest source of demand historically, has most likely already fulfilled its demand for international credits. In 2015, EU ETS installations exchanged just under 23 million CERs for EUAs. This means that to date, EU ETS installations have used almost 1.5 GtCO<sub>2</sub>e of CERs and ERUs of the total 1.6 GtCO<sub>2</sub>e allowed.<sup>18</sup> The remaining 0.1 GtCO<sub>2</sub>e of residual demand is likely to already be in the hands of EU ETS installations. No other substantial source of demand for CERs is available. Due to these conditions, half of the projects that had issued CERs by the end of 2012 ceased issuance beyond this date.<sup>19</sup> The CDM Executive Board is investigating ways to broaden demand for CERs and participation in the CDM.<sup>20</sup> Some carbon pricing initiatives at the national level still provide the possibility of demand for CERs, such as in Korea, Mexico and South Africa, although the demand is currently limited to domestic CERs. Also, paragraph 107 of the COP 21 decision encourages Parties to promote the voluntary cancellation of Kyoto credits. Additionally, some results-based finance (RBF) initiatives, where (a part of) the credits are not used by the buyer for compliance purpose, are additional sources of demand for CERs. The UNFCCC Secretariat estimates that the annual demand from RBF initiatives could amount to around 30 million CERs.<sup>21, s</sup> This includes initiatives such as the Norwegian Carbon Procurement Facility, and the World Bank's Pilot Auction Facility for Methane and Climate Change Mitigation, Carbon Partnership Facility and Carbon Initiative for Development.

### Results-based finance

The use of RBF mechanisms has continued to expand and develop. The Nitric Acid Climate Action Group was launched at COP 21 by the German Government. This initiative will purchase CERs generated from nitric acid emissions mitigation projects until 2020, on the condition that these projects will continue mitigation post-2020. Furthermore, on November 30, 2015, the World Bank announced the Transformative Carbon Asset Facility. Expected to be operational in late 2016, this facility will provide RBF to developing countries for

the implementation of large scale emission reduction programs with a focus on sectoral or policy-level programs. The initial target funding of US\$500 million will support about 10-15 programs, and is expected to leverage over US\$2 billion of finance.<sup>22</sup> In addition, in March 2016, the Green Climate Fund Board decided to assess the applicability of RBF to sectors supported by the fund.<sup>23</sup>

### Aviation sector

At the Assembly that will take place from September 27–October 7, 2016, the International Civil Aviation Organization (ICAO) is expected to decide on a Global Market-Based Measure, which is part of the basket of measures to achieve carbon-neutral growth post-2020.<sup>24</sup> If adopted, the Carbon Offsetting Scheme for International Aviation (COSIA) will start in 2021.<sup>25</sup> The CDM Executive Board, among others, is working with the ICAO on the design of the COSIA.<sup>26</sup>

## Regional, national, and subnational carbon pricing update

Carbon pricing has been implemented or is scheduled to commence in about 40 national and over 20 subnational jurisdictions, as displayed in Figure 1. As illustrated in Figure 3, the range of prices observed is broad, as each price reflects a different national or regional context. In 2015, carbon pricing raised about US\$26 billion<sup>†</sup> in government revenues—an increase of US\$10 billion, or 60%, compared to 2014. This trend is attributed to the growth in auction revenue in California and Québec as a result of expanded GHG coverage, and a substantial tax rate increase in France. Details on the main developments in carbon pricing over the past year are presented below.<sup>‡</sup>

### Australia

The Emissions Reduction Fund (ERF) has been used since April 2015 by the Australian Government to purchase emission reduction credits from approved, voluntary emission reduction projects through an auction.<sup>27</sup> To prevent the overall increase in domestic emissions, a safeguard mechanism will be added to the ERF from July 1, 2016, establishing an ETS. The safeguard mechanism requires facilities with annual emissions of over 100 kilotons CO<sub>2</sub>e to limit their emissions

<sup>s</sup> This does not include the potential demand from the new Nitric Acid Climate Action Group.

<sup>†</sup> Authors' calculations, based on auction revenue reports of the different ETSs, payments into Alberta's Climate Change and Management Fund, and the annual budget of governments with carbon taxes in place.

<sup>‡</sup> Countries and regions are listed in alphabetical order.



to their individual absolute baseline levels.<sup>28</sup> Facilities that exceed their emission baseline levels can purchase and surrender Australian emission reduction credits for compliance.<sup>29</sup> The Australian government intends to review the ERF and safeguard mechanism in 2017.<sup>30</sup>

### Canada

Back as a strong player in the climate space, carbon pricing is now under consideration on a national level in Canada. The “Vancouver Declaration on clean growth and climate change”<sup>31</sup> released on March 3, 2016 includes a commitment to form several working groups, one of which will focus on carbon pricing mechanisms. These focus groups will make proposals for a national climate policy framework in fall 2016.

Developments on the provincial level in Canada include the entry into force of the Greenhouse Gas Industrial Reporting and Control Act (GGIRCA) in British Columbia on January 1, 2016. This established an ETS that will cover the LNG facilities currently under construction, once they become operational.<sup>32</sup> Facilities under the GGIRCA will need to meet a GHG emission intensity target, purchase local offset credits or pay into a technology fund at a rate of CAN\$25/tCO<sub>2</sub>e (US\$19/tCO<sub>2</sub>e). The facilities will also be subject to the British Columbia carbon tax.

Alberta is planning to transition to an economy-wide carbon pricing system from January 1, 2017, increasing the overall coverage of carbon pricing from 45 percent of Alberta’s GHG emissions to 78–90 percent. In 2017, a carbon tax of CAN\$20/tCO<sub>2</sub>e<sup>33</sup> (US\$15/tCO<sub>2</sub>e) will apply to facilities not covered by the Specified Gas Emissions Regulation (SGER)—the current carbon pricing initiative in Alberta. Facilities under the SGER that meet their compliance obligations through contributions to the Climate Change and Environmental Management Fund already faced this carbon price from January 1, 2016 onward.<sup>34</sup> The carbon price will further increase to CAN\$30/tCO<sub>2</sub>e (US\$23/tCO<sub>2</sub>e) for SGER and non-SGER facilities from January 1, 2017 and 2018, respectively. The economy-wide carbon price initiative will be revenue neutral. The new carbon pricing legislation is expected by spring 2016.<sup>35</sup>

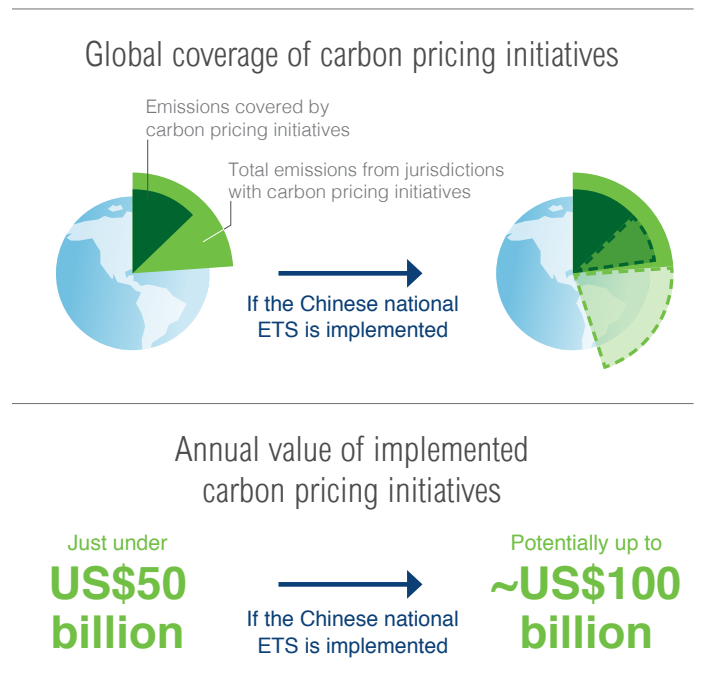
Manitoba, Ontario, and Québec signed a memorandum of understanding that stated their intention to link their ETSs under the Western Climate Initiative.<sup>36</sup> This follows separate announcements from Manitoba<sup>37</sup> and Ontario<sup>38</sup> in 2015 of their respective plans to introduce ETSs. Ontario published its draft ETS legislation on February 25, 2016.<sup>39</sup> If it receives legislative approval, the ETS will be launched on January 1, 2017, covering 82 percent of Ontario’s annual GHG emissions.<sup>40</sup> The design and

scope of the Ontario ETS is similar to the California and Québec Cap-and-Trade Programs.<sup>41</sup> With an expected carbon price of CAN\$18/tCO<sub>2</sub>e (US\$14/tCO<sub>2</sub>e) in the first year of operation, the Ontario ETS will generate about CAN\$1.9 billion (US\$1.5 billion) in revenue per year. The revenue will be invested in GHG emission reduction programs and energy efficiency programs.

### China

On September 25, 2015, the Chinese President announced that the Chinese national ETS will commence in 2017.<sup>42</sup> To prepare for this launch, the National Development and Reform Commission has requested the reporting and verification of historical GHG data from 2013 to 2015 for the sectors that are to be included in the national ETS by June 30, 2016.<sup>43</sup> From these sectors, provinces are compiling a list of companies with an annual energy consumption of more than 10,000 standard coal equivalent in any year over 2013–2015—these companies will be potential candidates for inclusion in the national ETS. Guangdong<sup>44</sup> and Chongqing<sup>45</sup> have already published their lists. The seven pilot ETSs are to be merged into the national ETS under unified rules and a detailed transition plan is under development.<sup>46</sup>

Figure 4. Global coverage and annual value of carbon pricing initiatives



Note: the information on the Chinese national ETS represents early unofficial estimates based on the Chinese President’s announcement in September 2015.

The pilot ETSs in Beijing, Chongqing, Guangdong, Hubei, Shanghai, Shenzhen and Tianjin have continued to evolve and some have expanded over the past year. In the Shanghai ETS pilot, the scope increased to cover the shipping sector,<sup>47</sup> while the Beijing ETS pilot expanded to cover the transport sector as well as power and cement companies in Chengde, Hebei, and Erdos and Hohhot in Inner Mongolia.<sup>48</sup> The mandatory participation emissions threshold was lowered in the Beijing ETS in 2015, from 10,000 tCO<sub>2</sub>e to 5,000 tCO<sub>2</sub>e.<sup>49</sup> In addition, changes were made to the coverage criteria in the Hubei pilot ETS. The ETS coverage criteria had been based on historical energy consumption over 2010–2011. However, in 2015, this timeframe was expanded to 2009–2014, leading to the inclusion of an additional 29 companies.<sup>50</sup> Despite the inclusion of additional companies, the 2015 cap in the Hubei ETS decreased from 324 MtCO<sub>2</sub>e in the previous year to 281 MtCO<sub>2</sub>e, in line with their mitigation ambition.<sup>51</sup>

The China Certified Emission Reduction (CCER) scheme has continued to grow: as of April 1, 2016, 501 CCER projects were registered, and a total of 27 MtCO<sub>2</sub>e of credits were issued by 100 of these projects.<sup>52</sup> The total transaction volume of CCERs in the pilot ETSs was 36 MtCO<sub>2</sub>e, with the Shanghai ETS accounting for 71 percent of this volume.<sup>53</sup> The price of CCERs is dependent on the pilot ETS in which it can be used for compliance, ranging from RMB13/tCO<sub>2</sub>e to RMB33/tCO<sub>2</sub>e (US\$2–5/tCO<sub>2</sub>e).<sup>v</sup> The CCER prices are also influenced by quantitative limits on CCER usage for compliance purposes, which are between 5–10 percent of the annual emissions depending on the pilot ETS.

## EU

To provide greater price stability and predictability in the EU ETS, the market stability reserve was legislated in October 2015 and will start shaping the supply of allowances from January 2019.<sup>54</sup> In addition, in July 2015, the European Commission put forward a proposal to revise the EU ETS post-2020.<sup>55</sup> The key changes include an increase in the annual cap reduction factor from 1.74 to 2.2 percent, better targeted and updated rules for free allocation of allowances to sectors at the highest risk of carbon leakage, and the establishment of funds to finance low-carbon innovation in industry and modernization of the energy sectors in lower-income member states. The proposal does not include any provisions for the use of international credits after 2020. The other two legislative bodies of the EU, the European

Council and Parliament, are currently discussing the proposal. So far, the proposal has not led to a significant increase in the EUA price, due to the persisting oversupply in the EU ETS. The EUA price was €5/tCO<sub>2</sub>e (US\$6/tCO<sub>2</sub>e) on April 1, 2016.

## Finland

In January 2016, the carbon tax rate for light and heavy fuel oil, coal and natural gas increased from €44/tCO<sub>2</sub> (US\$50/tCO<sub>2</sub>) to €54/tCO<sub>2</sub> (US\$62/tCO<sub>2</sub>). The purpose of the increase is to encourage the use of biomass and low emissions heating fuels, and improve the competitive position of peat and natural gas, especially compared to coal.<sup>56</sup>

## France

The carbon tax in France puts a carbon price on the use of fossil fuels not covered by the EU ETS, such as in the residential, service and transport sectors. The carbon tax rate increased from €14.5/tCO<sub>2</sub> (US\$17/tCO<sub>2</sub>) to €22/tCO<sub>2</sub> (US\$25/tCO<sub>2</sub>) from January 2016, following the trajectory to reach €100/tCO<sub>2</sub> (US\$114/tCO<sub>2</sub>) in 2030.<sup>57</sup> The government also announced the introduction of a carbon price floor for the electricity sector in France. Further details on the carbon price floor will be announced later this year.<sup>58</sup>

## Japan

The second compliance period of the linked Saitama and Tokyo ETSs started on April 1, 2015. The emission reduction target compared to the historical baseline emissions level for office buildings and district heating and cooling facilities in this compliance period increased to 15 and 17 percent under the Saitama and Tokyo ETSs, respectively.<sup>59</sup> For other (industrial) facilities, the target increased to 13 and 15 percent, respectively. At the start of the second compliance period, trading between the Saitama and Tokyo ETSs commenced; as of February 2016, only about 2,400 tCO<sub>2</sub>e Saitama credits had been purchased by entities under the Tokyo ETS.<sup>60</sup>

## Kazakhstan

Kazakhstan has suspended its ETS for two years starting from January 1, 2016 to address the imbalances in the system.<sup>61</sup> Over this period, the government will revise the rules on the issuance of emissions allowances, free allocation and the price stabilization reserve. These new rules will also reflect changes to the economy that have taken place since the Kazakhstan ETS rules were designed. During the suspension period, ETS facilities do not have a compliance obligation, but they are nonetheless required to report their emissions.

<sup>v</sup> The prices are based on CCER transaction data on the Shanghai Environment and Energy Exchange and the Beijing Environment Exchange between September 2015 and March 2016. Other pilot ETSs rarely disclose CCER prices.

## Mexico

Since the implementation of the carbon tax in 2014, the tax has generated almost US\$1 billion in revenue.<sup>62</sup> The existing carbon tax in combination with other climate initiatives, for example, the framework for a registry of national emissions and Clean Energy Certificates, are expected to enable a carbon market in 2018.

## New Zealand

International trade of Kyoto credits in the New Zealand Emission Unit Register (NZ EUR) ceased on November 18, 2015,<sup>63</sup> after New Zealand met its compliance obligation from the first commitment period of the Kyoto Protocol. Any holders of New Zealand Assigned Amount Units (AAUs) will be provided with an equivalent number of New Zealand Units. All other Kyoto units from the first commitment period in the NZ EUR will be cancelled in 2016. The New Zealand Government is currently reviewing the ETS, with a focus on the implications of removing the “one-for-two” transitional measure. This measure currently allows non-forestry ETS facilities to surrender one emission allowance for every two tons of CO<sub>2</sub>e emitted, thereby halving their compliance obligation.<sup>64</sup>

## Norway

In 2016, the carbon tax rate in Norway ranges between NOK29–436/tCO<sub>2</sub>e (US\$4–53/tCO<sub>2</sub>e), depending on the fuel and sector, compared to NOK25–427/tCO<sub>2</sub>e (US\$3–52/tCO<sub>2</sub>e) in 2015.<sup>65</sup> The Norwegian Government is considering reforms to the current carbon taxation system, which would introduce a single tax rate of NOK420/tCO<sub>2</sub>e (US\$51/tCO<sub>2</sub>e) for all non-ETS sectors.<sup>66</sup>

## Republic of Korea

Since the start of the Republic of Korea ETS on January 1, 2015, there have been low volumes of trade on the allowance market. No transactions took place between January 16 and October 6, 2015, and the total transaction volume in 2015 was 0.3 MtCO<sub>2</sub>e, representing a small share of the 573 MtCO<sub>2</sub>e cap.<sup>67</sup> In 2016, trade remains limited—as of May 1, 2016 the most recent trade took place on April 18, 2016, at a record high of KRW18,450/tCO<sub>2</sub>e (US\$16/tCO<sub>2</sub>e). The limited allowance trade has led to high demand for Korean offset credits over the past year, including Korean CERs,<sup>w</sup> which are also eligible for compliance under the ETS. Korean offset credits are now priced at a similar level to Korean allowances.<sup>68</sup>

## Slovenia

On April 1, 2016, Slovenia brought its carbon tax law in line with EU rules by removing exemptions on liquefied petroleum gas and natural gas.<sup>69</sup> A carbon tax rate of €17/tCO<sub>2</sub>e (US\$20/tCO<sub>2</sub>e) now applies to these fossil fuels; this rate also applies to other fossil fuels.

## South Africa

In November 2015, South Africa published a draft Carbon Tax Bill, which announced a delayed start date of January 1, 2017.<sup>70</sup> Under the draft legislation, offsets can be used for compliance and tax exemptions starting from 60 percent up to a maximum of 95 percent will apply. This means that the effective tax rate will be between R6–48/tCO<sub>2</sub>e (US\$0.4–3/tCO<sub>2</sub>e), compared to the full tax rate of R120/tCO<sub>2</sub>e (US\$8/tCO<sub>2</sub>e). Following a public consultation process, South Africa is currently revising the bill.

## Switzerland

On March 23, 2016, Switzerland's Federal Council approved the Paris Agreement and announced plans to revise the Federal Act on the Reduction of CO<sub>2</sub> Emissions (CO<sub>2</sub> Act).<sup>71</sup> This revised CO<sub>2</sub> Act could result in an increase in the carbon tax rate from the current level of CHF84/tCO<sub>2</sub>e (US\$88/tCO<sub>2</sub>e). A public consultation on the revision of the CO<sub>2</sub> Act will be held in summer 2016.

Following eight rounds of negotiations which started in 2011, Switzerland and the EU completed negotiations on January 25, 2016 to link their ETSs.<sup>72</sup> The agreement needs to be signed and ratified by both sides before it can enter into force. The timeline for this step is open. When the agreement enters into force, Switzerland needs to have integrated the aviation sector into its ETS to be consistent with the sectoral coverage of the EU ETS.<sup>73</sup>

## Ukraine

The Ukrainian Government published a concept ETS legislation in September 2015.<sup>74</sup> The legislation aims to establish an ETS which is in line with the EU ETS from 2017, with a goal to join the EU ETS in 2019. The full legislation is expected by late 2016.<sup>75</sup>

<sup>w</sup> CERs need to be canceled before they can be converted to Korean offsets.

## United States

On a national level, the final rules of the US Environmental Protection Agency's Clean Power Plan (CPP) were announced on August 3, 2015.<sup>76</sup> The CPP aims to reduce emissions in the power sector by 32 percent of 2005 levels by 2030. Each state has an individual target and states have the flexibility to choose their own compliance mechanisms, including emissions trading.<sup>77</sup> Following legal action by some states, the US Supreme Court suspended the implementation of the CPP on February 9, 2016 pending a judicial review.<sup>78</sup> Nonetheless, some states continue to support and prepare for the implementation of the CPP,<sup>79</sup> including California and the RGGI states.<sup>80</sup>

Developments on the subnational level include the 2016 program review of the Regional Greenhouse Gas Initiative (RGGI). This review is currently underway and focuses on post-2020 cap setting, flexibility mechanisms and broadening the RGGI market.<sup>81</sup> In addition, New York—one of the RGGI states—is engaging with other RGGI states to investigate linking RGGI to the linked California and Québec Cap-and-Trade programs, as well as the planned Ontario ETS.<sup>82</sup>

There has been mixed progress on the other ETSs under consideration in the US. In January 2016, Washington State released its draft Clean Air Rule which would establish an ETS in 2017 covering about 60 percent of the state's GHG emissions.<sup>83</sup> The rule will be updated by spring 2016, and adoption is expected by summer 2016.<sup>84</sup> In Oregon, various bills were launched in the past year to establish an ETS; however, these bills were not passed by the legislature.<sup>x</sup> Despite these difficulties, Oregon continues to actively consider the implementation of market-based approaches to reduce GHG emissions.<sup>85</sup>

## Corporate carbon pricing update

Corporate carbon pricing is now becoming a widely used tool for corporate strategic investment decisions, helping companies shift to lower-carbon business models. In 2015, 435 companies reported to CDP that they are using an internal price on carbon—almost a threefold increase from the previous year.<sup>86</sup> An additional 583 companies stated that they are planning to implement an internal carbon price over the course of 2016–2017.<sup>87</sup> Of the companies that have publicly disclosed that they are using an internal price on carbon, 94 percent are

located in countries where mandatory carbon pricing is in place, scheduled for implementation or under consideration at a national or subnational level. The reported corporate carbon prices in use are diverse, ranging from US\$1/tCO<sub>2</sub>e to US\$357/tCO<sub>2</sub>e. This range is broader than the mandatory carbon price range, indicating that some companies are moving beyond the use of internal carbon pricing as a strategic risk management tool to evaluate the potential impact of carbon pricing initiatives on their operations. These companies are also using it to explore cost savings and revenue opportunities through innovation. The UNGC has called for businesses to adopt an internal carbon price of at least US\$100/tCO<sub>2</sub>e by 2020, which will be needed to keep GHG emissions consistent with a 1.5–2°C pathway.<sup>88</sup> In 2015, six companies disclosed internal carbon pricing levels that are consistent with this recommendation.

Together with the CPLC,<sup>89</sup> other initiatives have provided substantial technical information, allowing government and businesses leaders to take informed decisions on policy design and implementation. The Partnership for Market Readiness provides support to prepare and implement climate change mitigation policies—including carbon pricing initiatives—in order to scale up GHG mitigation.<sup>90</sup> The World Bank's Networked Carbon Markets is exploring how a future international carbon market could accommodate a "patchwork" of different, domestic climate actions.<sup>91</sup> Through the Caring for Climate initiative's Business Leadership Criteria on Carbon Pricing, companies are also demonstrating their commitment to leadership on corporate carbon pricing.<sup>92</sup> As of February 2016, 67 companies have committed to align with the criteria: setting a material internal carbon price, showing public support for carbon pricing and communication on these activities.

In addition, institutional investors are actively engaging with governments on the risks of weak climate policy and the need for a carbon price through the Global Investor Statement on Climate Change.<sup>93</sup> As of December 2015, 409 institutional investors representing over US\$24 trillion in assets had signed the statement. Signatories to the statement commit to engage with governments to support climate finance, assess low-carbon investment opportunities, and build capacity to assess their climate risks and opportunities. They will also work with the companies in which they invest to minimize climate risks.

<sup>x</sup> Between January 2015 and April 2016, bills to introduce carbon pricing have been proposed to both the House (HB3176, HB3250, HB3252, HB3470) and the Senate (SB965 and SB1574-A) of Oregon.



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Definition of carbon pricing: For the purpose of the State and Trends of Carbon Pricing report series, and also applicable to this brief, carbon pricing refers to initiatives that put an explicit price on greenhouse gas emissions. This includes emissions trading systems, offset mechanisms, carbon taxes, corporate carbon pricing and results-based finance, using a metric directly based on carbon (i.e. price per ton of CO<sub>2</sub>e). Policies that put an implicit price on carbon, for example removal of fossil fuel subsidies, fuel taxation, support for renewable energy, and energy efficiency certificate trading, are not included as they are outside the scope of this brief.