Global panorama of carbon prices in 2017

Authors: Clément **Métivier** | Sébastien **Postic** | Emilie **Alberola** | Madhulika **Vinnakota**.
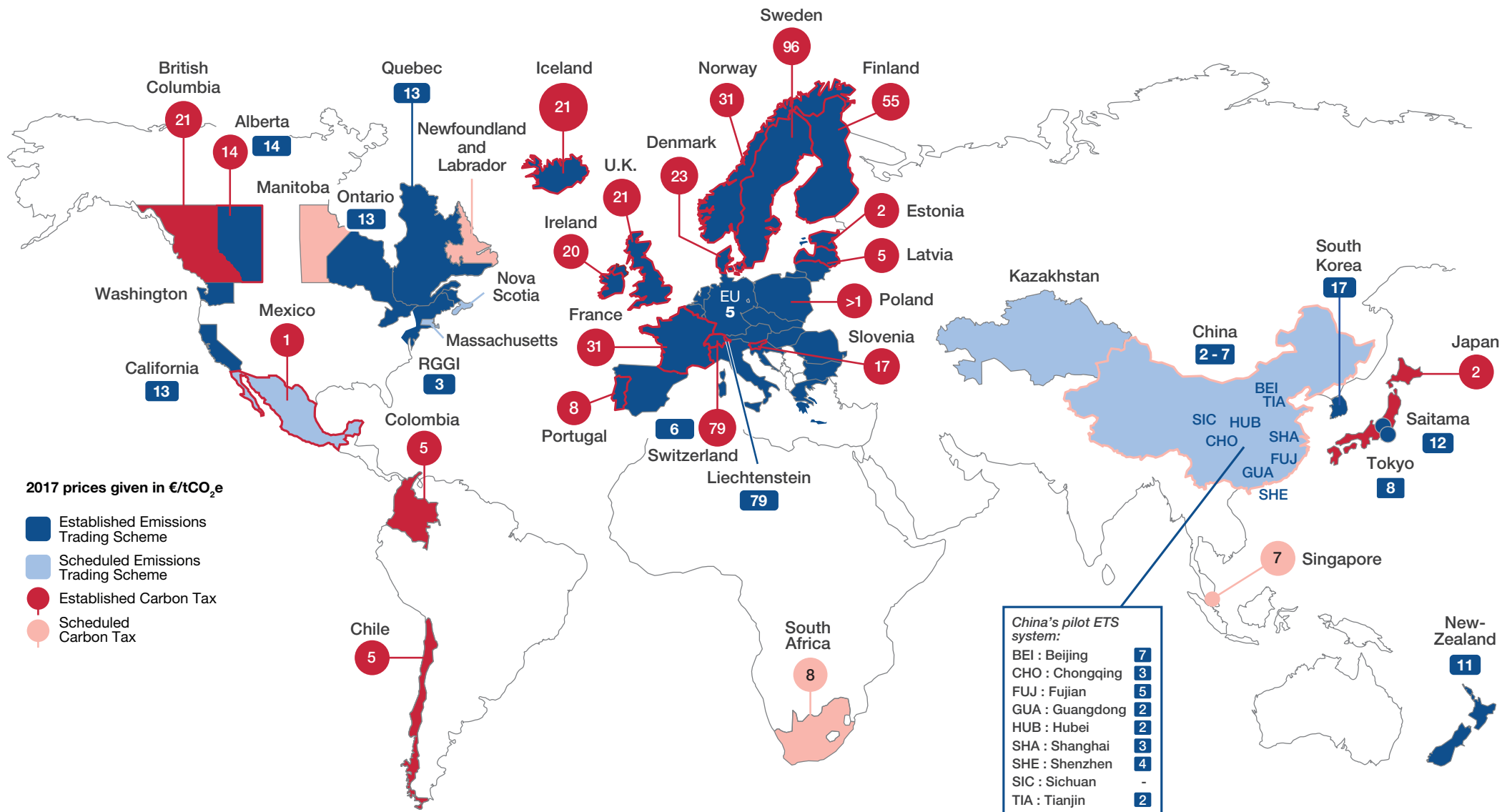Paris, October 2017

INTRODUCTION

In September 2017, I4CE updated its database on carbon pricing policies. This panorama presents key trends regarding the implementation of explicit carbon pricing policies at the regional and national level in 2017. A timeline, a world map, a detailed table and a graph provide comprehensive information on the jurisdictions that have implemented or plan to implement explicit carbon pricing policies, the type of instrument chosen, the sectors covered, the pricing levels and the use of revenues.

5 key trends for 2017

1. **(Too) Few jurisdictions have implemented an explicit carbon price.** As of September 1st, 2017, more than 40 countries and 25 provinces or cities have adopted carbon pricing policies, consisting of carbon taxes and Emissions Trading Schemes (ETS). These jurisdictions account for around 25% of global greenhouse gas emissions.

2. **However, the adoption of carbon pricing policies is accelerating.** Since 2016, 10 ETS and 8 carbon taxes have been implemented or announced for the years to come. In the next few months, the next major step will be the launch of a national ETS in China, which will become the largest carbon pricing initiative worldwide.

3. **Carbon revenues, which have decreased in 2016, remain an important financing tool for both the environment and the economy.** In 2016, USD 22 billion of public revenues were generated with carbon pricing initiatives, according to World Bank estimates. This amount marks a diminution compared to the USD 26 billion collected in 2015, which can be explained by the low prices of carbon in some ETS such as the European Union, California and Quebec. In 2016, two thirds of carbon pricing revenues come from carbon taxes. If we look at how the revenues are allocated, each jurisdiction makes clear choices, but no trend emerges at the global level.

4. **Carbon prices are perceived as too low for the economic sphere.** The explicit price of a CO_2 ton in 2017 varies generally between €1 and €100 depending on the jurisdiction. However, more than 75% of emissions regulated by carbon pricing are covered by a price below €10, a level considered to be too low for the public and private sectors in order to support the low carbon transition.

5. **Explicit carbon prices in 2017 are not aligned with the costs of necessary climate action in order to stay on the 2°C trajectory.** To achieve the goals of the international community on climate change while sustaining economic growth, the High Level Commission on carbon prices led by economists Stern and Stiglitz recommends to reach a carbon price between USD 40 and USD 80 per ton of CO_2 by 2020, and between USD 50 and USD 100 by 2030.

Map of explicit carbon prices around the world in 2017

I4CE INSTITUTE FOR CLIMATE ECONOMICS
Une initiative de la Caisse des Dépôts et de l'Agence Française de Développement

Sweden 96
Norway 31
Finland 55
Iceland 21
Denmark 23
British Columbia 21
Alberta 14
Quebec 13
Newfoundland and Labrador
Manitoba
Ontario 13
U.K. 21
Ireland 20
Estonia 2
Latvia 5
Poland >1
Washington
Nova Scotia
EU 5
Slovenia 17
Kazakhstan
South Korea 17
California 13
Mexico 1
Massachusetts
RGGI 3
France 31
Japan 2
China 2 - 7
Saitama 12
Colombia 5
Portugal 8
Switzerland 6
Liechtenstein 79 / 79
Tokyo 8

BEI
TIA
SIC
HUB
CHO
SHA
FUJ
GUA
SHE

2017 prices given in €/tCO$_2$e

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

Chile 5
South Africa 8
Singapore 7
New-Zealand 11

China's pilot ETS system:

BEI : Beijing	7
CHO : Chongqing	3
FUJ : Fujian	5
GUA : Guangdong	2
HUB : Hubei	2
SHA : Shanghai	3
SHE : Shenzhen	4
SIC : Sichuan	-
TIA : Tianjin	2

Features of carbon prices in 2017

Instruments:
- ESTABLISHED EMISSIONS TRADING SCHEME
- SCHEDULED EMISSIONS TRADING SCHEME
- ESTABLISHED CARBON TAX
- SCHEDULED CARBON TAX

Sectors: ENERGY · INDUSTRY · TERTIARY · TRANSPORT · WASTE · AVIATION

Fuels: COAL · OIL · GAS

Jurisdiction		Year of implementation	Price in €/tCO$_2$ (nominal value)**	Share of emissions (%)	Sectoral scope	Fuels covered
EU ETS		2005	5	45	Energy, Industry, Aviation	
New-Zealand*		2008	11	51	Energy, Industry, Tertiary, Transport, Waste	Coal, Oil, Gas
Switzerland		2008	79	35	Energy	
RGGI, USA		2009	3	20	Energy	
Tokyo		2010	8	20	Industry, Tertiary	
Saitama		2011	12	18	Industry, Tertiary	Coal, Oil, Gas
California		2013	13	85	Energy, Tertiary, Transport	Coal, Oil, Gas
Quebec		2013	13	85	Energy, Tertiary, Transport	Coal, Oil, Gas
China	Beijing	2013	7	40	Energy, Industry, Tertiary, Transport	
	Guangdong	2013	2	60	Energy, Industry, Aviation	
	Shanghai	2013	3	57	Energy, Tertiary, Aviation	
	Shenzhen	2013	4	40	Industry, Tertiary, Transport	
	Tianjin	2013	2	55	Energy, Industry	
	Chongqing	2014	3	40	Energy, Industry	
	Hubei	2014	2	35	Energy, Industry	
	Fujian	2016	5	60	Energy, Industry, Aviation	
	Sichuan	2017	NC	NC	Industry	
South Korea		2015	17	68	Energy, Industry, Tertiary, Transport, Waste, Aviation	
Alberta		2017	14	45		Coal, Oil, Gas
China		2017	NC	35	Energy, Industry, Aviation	
Ontario		2017	13	82	Energy, Tertiary, Transport	
Washington		2017	NC	66	Energy, Industry	
Kazakhstan		2018	NC	NC	Energy, Industry	
Massachusetts		2018	NC	NC	Energy	
Mexico		2018	NC	NC	Energy, Industry, Transport	
Nova Scotia		2018	NC	NC	Energy, Industry	

Jurisdiction	Year of implementation	Price in €/tCO$_2$ (nominal value)**	Share of emissions (%)	Sectoral scope	Fuels covered
Finland	1990	55	36		Coal, Oil, Gas
Poland	1990	>1	4		
Norway	1991	31	60		Oil, Gas
Sweden	1991	96	42		Coal, Oil, Gas
Denmark	1992	23	45		Coal, Oil, Gas
Latvia	1995	5	15	Industry, Transport	Aviation
Slovenia	1996	17	24		Coal, Oil, Gas
Estonia	2000	2	3	Energy, Industry	
Alberta	2007	14	45	Energy, Industry, Waste	Coal, Oil, Gas
British Columbia	2008	21	70		Coal, Oil, Gas
Liechtenstein	2008	79	26		Oil, Gas
Switzerland	2008	6	11	Industry	
Ireland	2010	20	33		Coal, Oil, Gas
Iceland	2010	21	55		Coal, Oil, Gas
Japan	2012	2	70		Coal, Oil, Gas
United-Kingdom	2013	21	25	Energy	Coal, Oil, Gas
France	2014	31	40		Coal, Oil, Gas
Mexico	2014	1	46		Coal, Oil, Gas
Portugal	2015	8	26		Oil, Gas
Chile	2017	5	40	Energy, Industry	
Colombia	2017	5	30		Coal, Oil, Gas
South Africa	TBD in 2017	8	75	Industry	
Manitoba	2018	NC	NC		
Newfoundland-and-Labrador	2018	NC	NC	Industry	
Singapore	2019	7	NC	Energy, Industry	
China	2020	NC	NC	Industry	

* The ETS in New Zealand also covers the forest sector.

** Source: I4CE according to ICAP, IETA, World Bank and collection of public data. ETS prices are mean values observed between March 2016 and March 2017.

Carbon price in €/tCO$_2$: Less than 10€ · Between 11€ and 30€ · More than 30€

Percentage of GHG emissions covered by carbon pricing: Less than 35% · Between 36% and 65% · More than 65%

Source: I4CE – Institute for Climate Economics, September 2017

Carbon pricing: use of revenues (in millions of euros)

1 Year of implementation
- Carbon tax since 2013
- Carbon tax between 2008 and 2013
- Carbon tax before 2007
- Emissions Trading Scheme since 2013
- Emissions Trading Scheme between 2008 and 2013
- Emissions Trading Scheme before 2007

2 Revenue uses
- Green projects
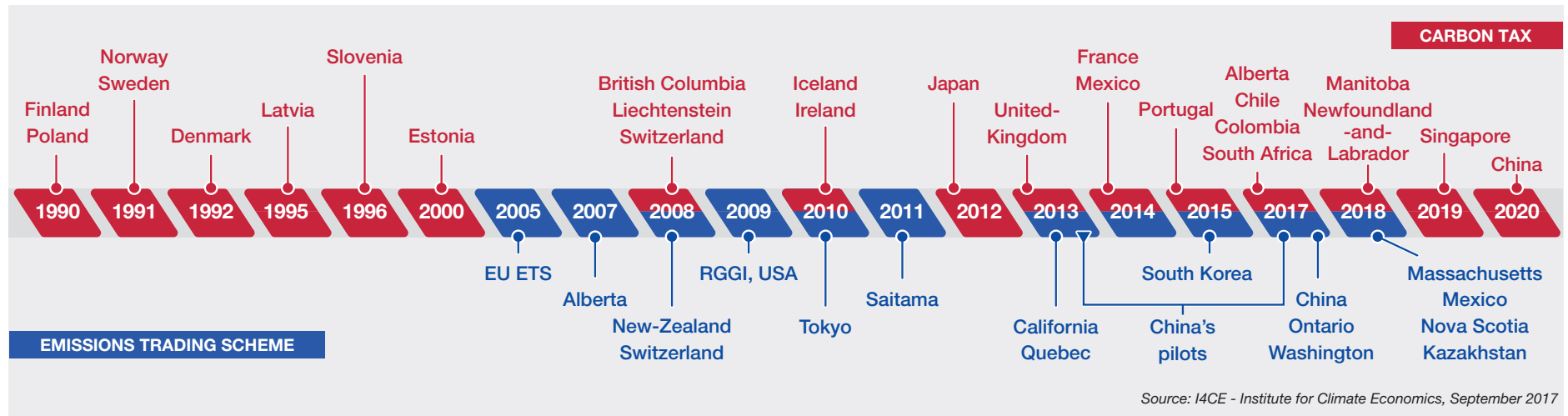- General budget allocation
- Tax exemptions
- Other uses
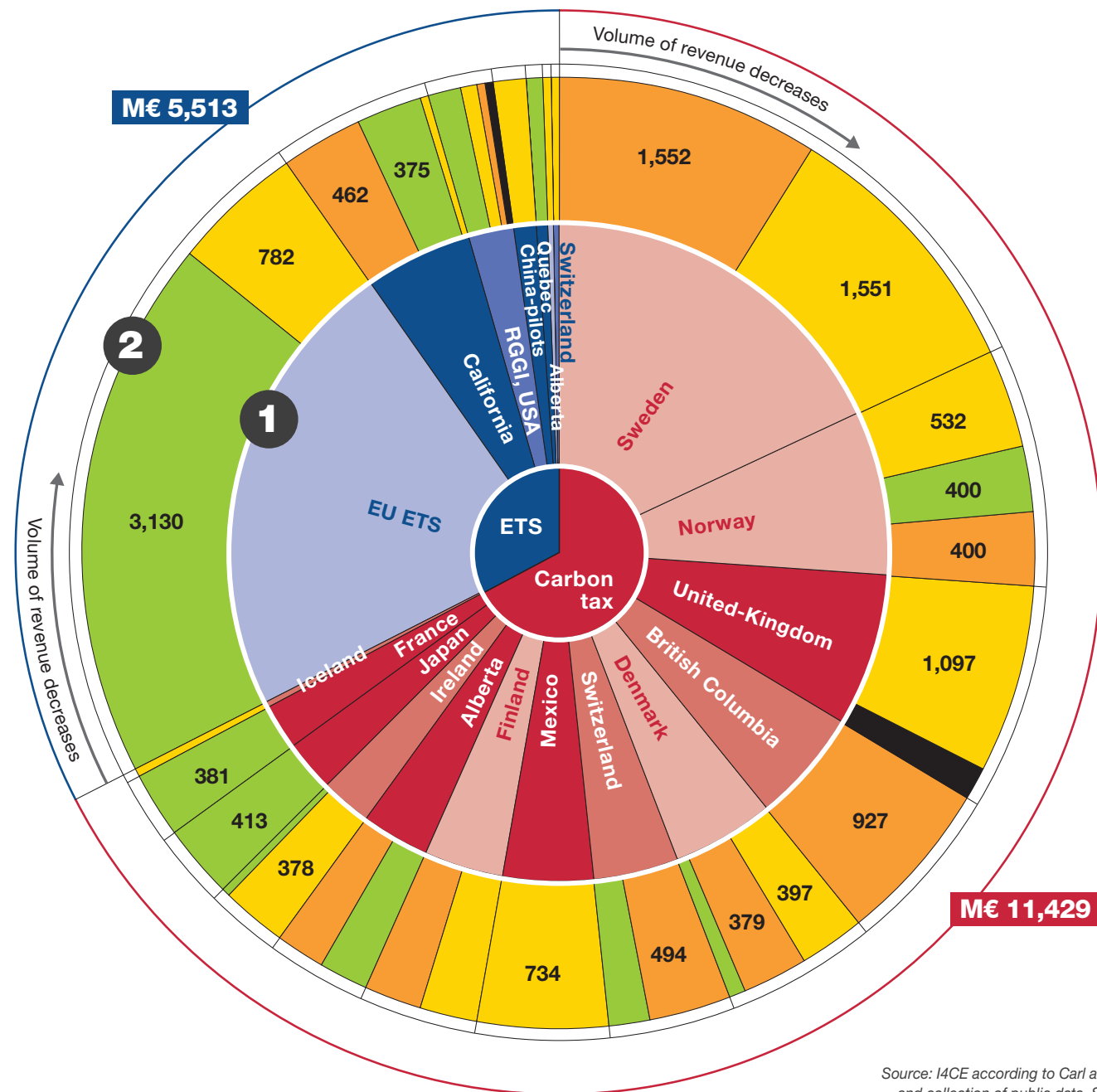
Key takeaways

- Figures represented here are for fiscal year 2013-2014. If no data was available, a previous year was taken into account.

- 75% of carbon revenues are generated by carbon taxes, amounting to 11,429 millions of euros. ETS have generated 5,513 millions of euros.

- More than 60% of carbon revenues come from member countries of the European Union.

- At the global scale, 34% of revenues are used for projects dedicated to the low-carbon transition; 37% are allocated in the general budget; and 29% finance tax exemptions.

Note: Figures represented here are for fiscal year 2013- 2014. If no data was available, a previous year was taken into account.

Carbon pricing implementation timeline

CARBON TAX

1990 Finland, Poland	**1991** Norway, Sweden	**1992** Denmark	**1995** Latvia	**1996** Slovenia	**2000** Estonia	**2005**	**2007**

EU ETS (2005) · Alberta (2007) · British Columbia, Liechtenstein, Switzerland (2008) · New-Zealand, Switzerland (2008) · RGGI, USA (2009) · Iceland, Ireland (2010) · Tokyo (2010) · Japan (2011) · Saitama (2011) · United-Kingdom (2012) · France, Mexico (2013) · California, Quebec (2013) · Portugal (2014) · China's pilots (2014) · Alberta, Chile, Colombia, South Africa (2015) · South Korea (2015) · Manitoba, Newfoundland-and-Labrador (2017) · China, Ontario, Washington (2017) · Singapore (2019) · Massachusetts, Mexico, Nova Scotia, Kazakhstan (2018) · China (2020)

EMISSIONS TRADING SCHEME

Source: I4CE - Institute for Climate Economics, September 2017

What is an explicit carbon price?

Two instruments put a price directly on greenhouse gas (GHG) emissions: the carbon tax is a *price-based* instrument and the Emissions Trading Scheme (ETS) is a *quantity-based* instrument.

- The **carbon tax** is a monetary levy added to the sale price of a good depending on the quantity of GHGs emitted during its production and / or use. A carbon tax may be applied at various stages of the supply chain and may target upstream producers or downstream companies and end users.
- The **Emissions Trading Scheme** (ETS) is a mechanism that sets emission reduction obligations for market participants and distributes emission quotas corresponding to this ceiling. Participants can buy their quotas to compensate for excessive emissions or sell their quotas to promote additional reduction efforts.

Sources

- ICAP (2017). Emissions Trading Worldwide: Status Report 2017. Berlin: International Carbon Action Partnership. Available **here**
- IETA (2016). The World's Carbon Markets: a Case Study Guide to Emissions Trading. International Emissions Trading Association. Available **here**
- World Bank and Ecofys (2017). Carbon Pricing Watch 2017 (May). Washington DC: World Bank. Available **here**
- PMR - Partnership for Market Readiness (2017). Carbon Tax Guide: a Handbook for Policy Makers. & Appendix: Carbon Tax Case Studies. Washington DC: World Bank. Available **here**
- Carl, Jeremy and Fedor, David (2016). Tracking global carbon revenues: A survey of carbon taxes versus cap-and-trade in the real world. Energy Policy 96, pp. 50-77. Available **here**
- For more precisions on the sources used for the Global panorama of explicit carbon prices, and especially on national sources: **contact@i4ce.org**

Création-réalisation: SophieBerlioz.fr

Read this note on > **i4ce.org**