Global carbon accounts in 2021

Authors: Dr Sébastien **Postic** | Marion **Fetet**
Paris, October 2021

4 key trends for 2021

1. As of October 1st, 2021, 47 jurisdictions (countries, provinces, or cities) are operating a carbon pricing scheme (carbon tax and/or an Emissions Trading System (ETS)). Together, they account for around 60% of global gross domestic product (GDP). Over the past year, two G20 countries have implemented an explicit price on carbon: China and Germany.
2. Carbon pricing schemes generated USD 56.8 billion (EUR 49 billion) over the FY 2020-2021; a significant increase compared with the previous fiscal year (USD 48 billion). 52% of this revenue stems from carbon taxes. The other 48% of revenue comes from ETS auctions. These carbon revenues are mostly directed to national general budgets or are earmarked for specific environmental or development projects.
3. As of October 1st, 2021, explicit carbon prices range from less than USD 1 to USD 142 (EUR 117) per ton of CO_2e. Yet, more than 46% of emissions regulated by carbon pricing are still covered by a price below USD 10 (EUR 8). To stay on the 2°C trajectory while sustaining economic growth, the High-Level Commission on carbon prices led by economists Stern and Stiglitz recommends reaching carbon prices comprised between USD 40 and USD 80 per ton of CO_2e by 2020, and between USD 50 and USD 100 per ton of CO_2e by 2030.
4. Together, jurisdictions with a carbon mechanism (tax or ETS) emit 60% of global greenhouse gas (GHG). This does not mean that 60% of global emissions are effectively covered by a carbon price: some sectors or populations may be exempted (totally or partially) for various reasons. Furthermore, fossil fuel subsidies still represent at least USD 450 billion in 2020 (see page 4).

Sources are available online on I4CE website
Feedback or need further information requests are welcome, you can contact us at contact@i4ce.org

FOCUS ON…

THE EUROPEAN CARBON BORDER ADJUSTMENT MECHANISM

As part of its "Fit for 55" policy package, the European Commission has proposed a Carbon Border Adjustment Mechanism (CBAM) to complement its existing Emissions Trading Scheme (ETS), starting in 2026. Foreign producers in designated high-emission sectors (steel, cement, aluminum, fertilizers, electricity) would pay a carbon price upon importing their products into the EU, unless they were facing national carbon prices on par with those faced by EU manufacturers subject to the EU ETS. The revenue generated would be partially earmarked to support low-carbon innovation. The CBAM, by addressing the risk of carbon leakage, would enable the EU to phase out the current free permit allocations by 2035, and would ramp up the ambition of its cornerstone climate policy tool.

However, the design of such a tool is highly complex and intricate: carbon tariffs must consider the carbon content of products, the existence of a carbon price in the exporter's country, potential regulations that would act as a carbon price (*e.g.*, emission standards), each country's status in the Paris Agreement[1], and more. Additionally, carbon tariffs should meet non-discrimination criteria between foreign and European producers, and between two foreign producers, imposed by the World Trade Organization (WTO). Yet, much is at stake: in reaction to the European announcement, several countries (Russia, Malaysia, Kazakhstan, Taiwan) have already moved to introduce a carbon price by 2022. It is yet to be determined whether more foreign countries will implement carbon prices, whether these prices will last, and whether these will indeed contribute to the climate efforts of EU trading partners.

1 The Paris Agreement sets differentiated responsibilities on developed and developing countries through its "Annex I" provisions

THE ETS REFORM IN NEW ZEALAND

The New Zealand Emissions Trading Scheme (NZ ETS), in place since 2008, covers the following sectors: power, industry, buildings, transport (including aviation), and waste and forestry. Agriculture is set to enter in 2025. An extensive reform in 2020 introduced three major innovations:

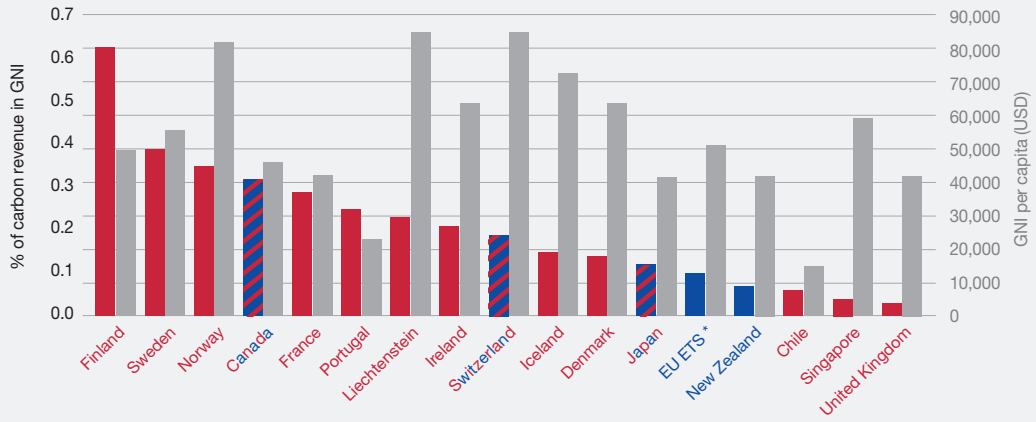
- **A cap on total covered emissions** (160 MtCO_2e for the 2021-2025 period). Until now, each emitting firm had its own cap and could acquire flexibility through the purchase of "forestry carbon credits" from referenced forest owners.
- **An auction price floor** starting at NZ$ 20/tCO_2e in 2021 and set to increase by 2% annually. Should an auction price materialize below this threshold, the auction will be cancelled in assumption that enough allocations (called New-Zealand units, NZUs) are already in circulation. This price floor does not prevent market participants from trading allowances in the secondary market for a lower price.
- **A cost containment reserve** that to put extra allowances in auction when the auction price tops a specified 'trigger price'. This ceiling price is set at NZ$ 50/t for 2021 (+2%/y). Through increasing the number of NZUs, the reserve ensures that auction prices remain below the trigger price. Again, this price ceiling does not hold in the secondary market.

In 2021, 26 million NZUs were scheduled for auction, including 7 million NZUs from the cost containment reserve.

Carbon dashboard in 2021

Only jurisdictions with a carbon pricing scheme are displayed on the following charts. Jurisdictions with no carbon price, like Qatari or Russia, are left out.
Carbon revenues include subnational revenues. For instance, the US carbon revenue come from three subnational schemes (there is no federal price): California's ETS, the Regional Greenhouse Gas Initiative (RGGI) and the cap on Emissions from Electricity Generators in Massachusetts.

SHARE OF CARBON REVENUE IN THE GROSS NATIONAL INCOME (GNI) PER CAPITA IN 2020



GNI/cap (USD)

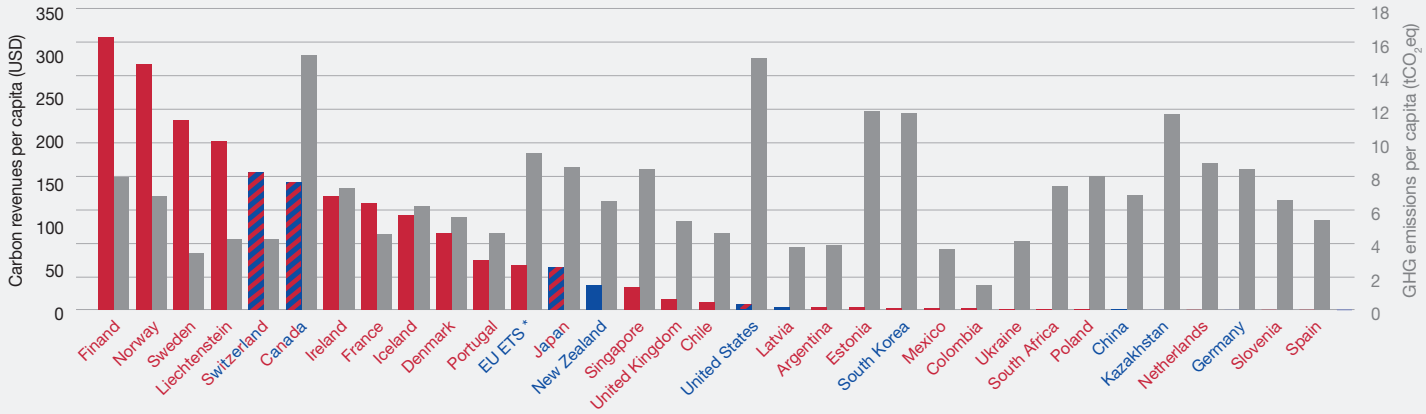
Carbon revenues generated by:
- Carbon tax
- ETS
- Carbon tax & ETS

*EU ETS : Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Iceland, Liechtenstein, Norway.

Carbon revenue from the following countries are inferior to 0.03% of the gross national income: Columbia, Argentina, Ukraine, Mexico, Latvia, South Africa, United States, Estonia, South Korea, Poland, and China.

@I4CE_

CARBON REVENUE AND GHG EMISSIONS PER CAPITA PER COUNTRY



GHG emissions per capita

Carbon revenues generated by:
- Carbon tax
- ETS
- Carbon tax & ETS

*EU ETS : Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom,Iceland, Liechtenstein, Norway.

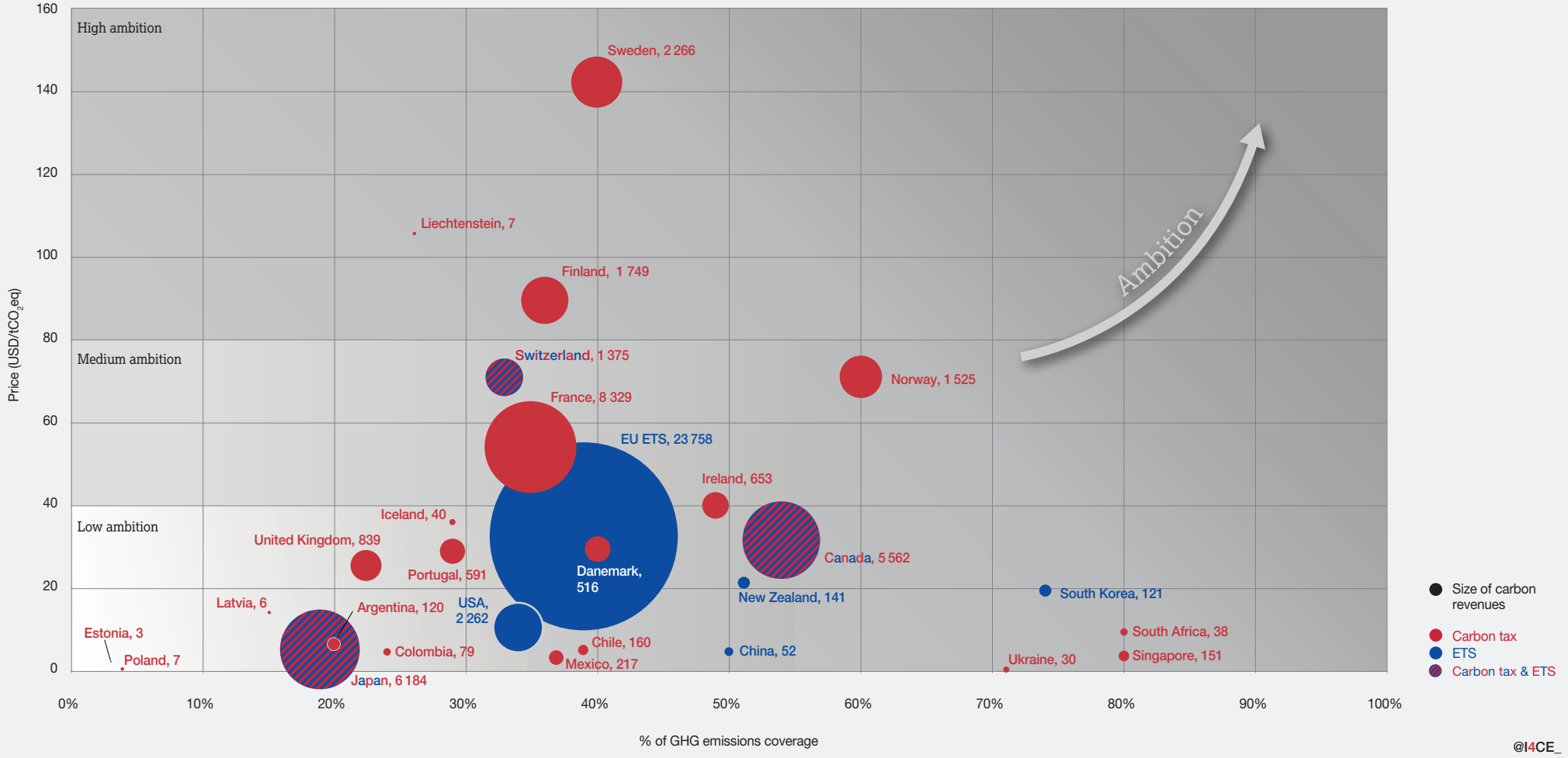
EU ETS emissions include member states' national emissions and those from the United Kingdom, Iceland, Liechtenstein, and Norway.

The United Kingdom opted out from the EU ETS at the end of 2020 following Brexit. It has its own ETS since 2021. The 2020 EU ETS carbon revenue displayed here are the last to include revenue from the UK.

@I4CE_

Carbon dashboard in 2021

AMBITION OF THE DIFFERENT CARBON PRICING SYSTEMS

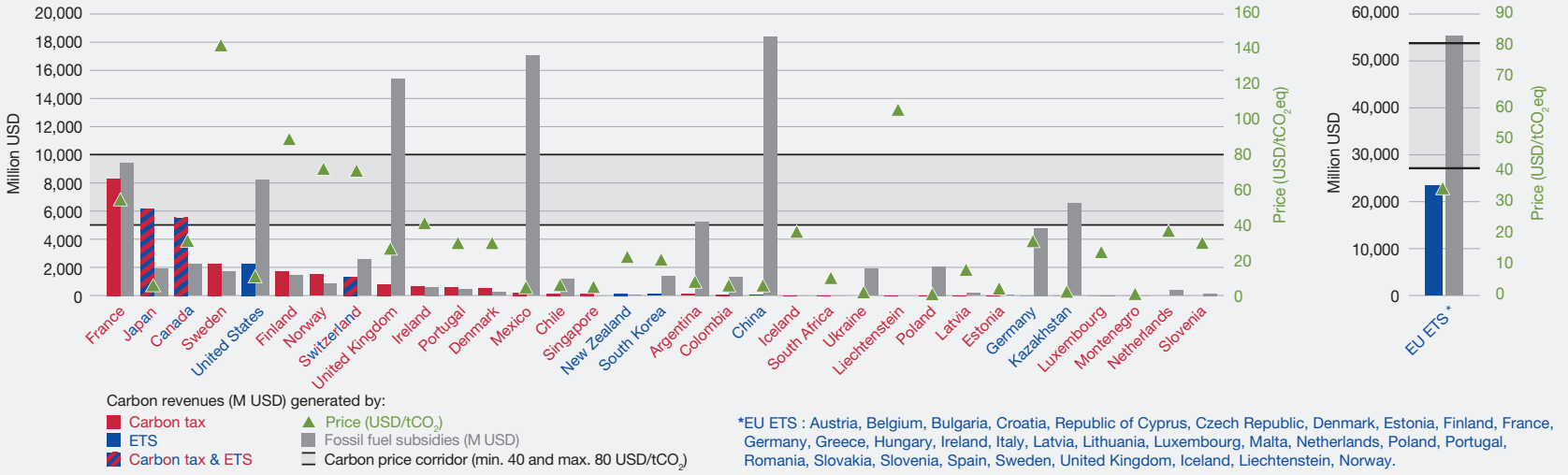


How to read this chart: The circle size corresponds to the total revenues generated. For instance, the EU ETS covers 39% of the EU's GHG emissions at an average price of USD 32.46 /tCO_2e and generated USD 23,758 million in 2020. An ambitious carbon pricing policy relies on two main factors: a wide coverage of emitting sectors and activities, and a high price.

NB: On this graph, 'coverage' refers to the emissions covered by one specific scheme in a given jurisdiction, not considering parallel or complementary pricing systems. For instance, the 35% figure for the French carbon tax does not account for the emissions covered by the EU ETS (roughly another 30% of French emissions). Adding it up, around 65% of total French GHG emissions are covered by a carbon price. For further information, please read A first 360-degree climate assessment of France's State budget, I4CE, 2019.

Carbon dashboard and support to fossil fuels

CARBON REVENUES AND PUBLIC FOSSIL FUEL SUBSIDIES



*EU ETS : Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Iceland, Liechtenstein, Norway.

@I4CE_

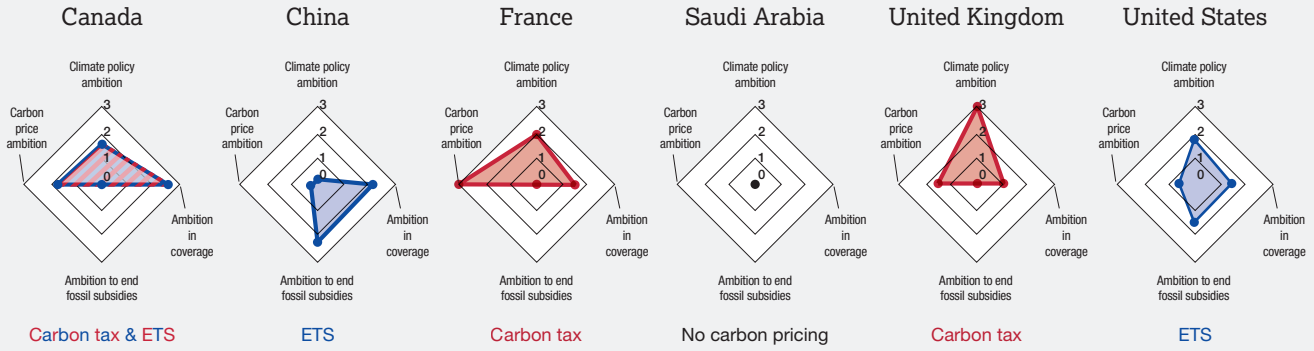
How to read this chart:
In 2019, China subsidized fossil fuels at USD 18,379 million. Meanwhile, the various carbon pricing schemes in the country generated USD 52 million in 2020 at an average price of USD 4.81/tCO_2eq.

Sources: OECD, IEA, IMF on FossilFuelSubsidyTracker.org

NB: Estimates for public support to fossil fuels depend on the definition used. According to the International Monetary Fund (IMF), explicit production subsidies (in the form of direct public subsidies) amount to USD 450 billion in 2020. Yet, this figure can rise to USD 5,900 billion if taking into account implicit subsidies such as not pricing environmental damage. For instance, fossil fuels subsidies estimates range from USD 20 bn to USD 2,000 bn for China in 2020. The graph above considers only explicit subsidies, *i.e.*, the lower end of the range.

Source: IMF Working paper, Still Not Getting Energy Prices Right: A Global and Country Update of Fossil Fuel Subsidies, 2021

COMPARISON OF SOME SYSTEMS' AMBITION ON CARBON PRICING POLICY



@I4CE_

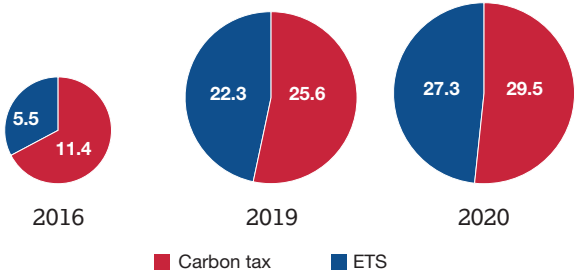
How to read this chart: each axis is scored from 0 to 3, 3 being the best score. The axis 'climate policy ambition' shows the gap between the country's current Nationally Determined Contribution (NDC) and what its NDC should be to achieve the global 1.5° C objective, according to the Climate Action Tracker and the National Pathway Explorer *(Source: Climate Analytics, World Resources Institute 2021: Closing the gap: the impact of G20 climate commitments on limiting global temperature rise to 1.5°C)*. The axis 'Ambition in coverage' considers the share of emissions covered by a carbon price (coverage above 70% yields a score of 3). The axis 'Ambition to end fossil fuel subsidies' is calculated against the global average of fossil fuel subsidies according to the Fossil Fuel Subsidy Tracker, above-average support yields a '0'. The final axis, 'Ambition in carbon price', considers whether the carbon price is within the price corridor proposed by the High-Level Commission (from USD 40 to USD 80/tCO_2e).

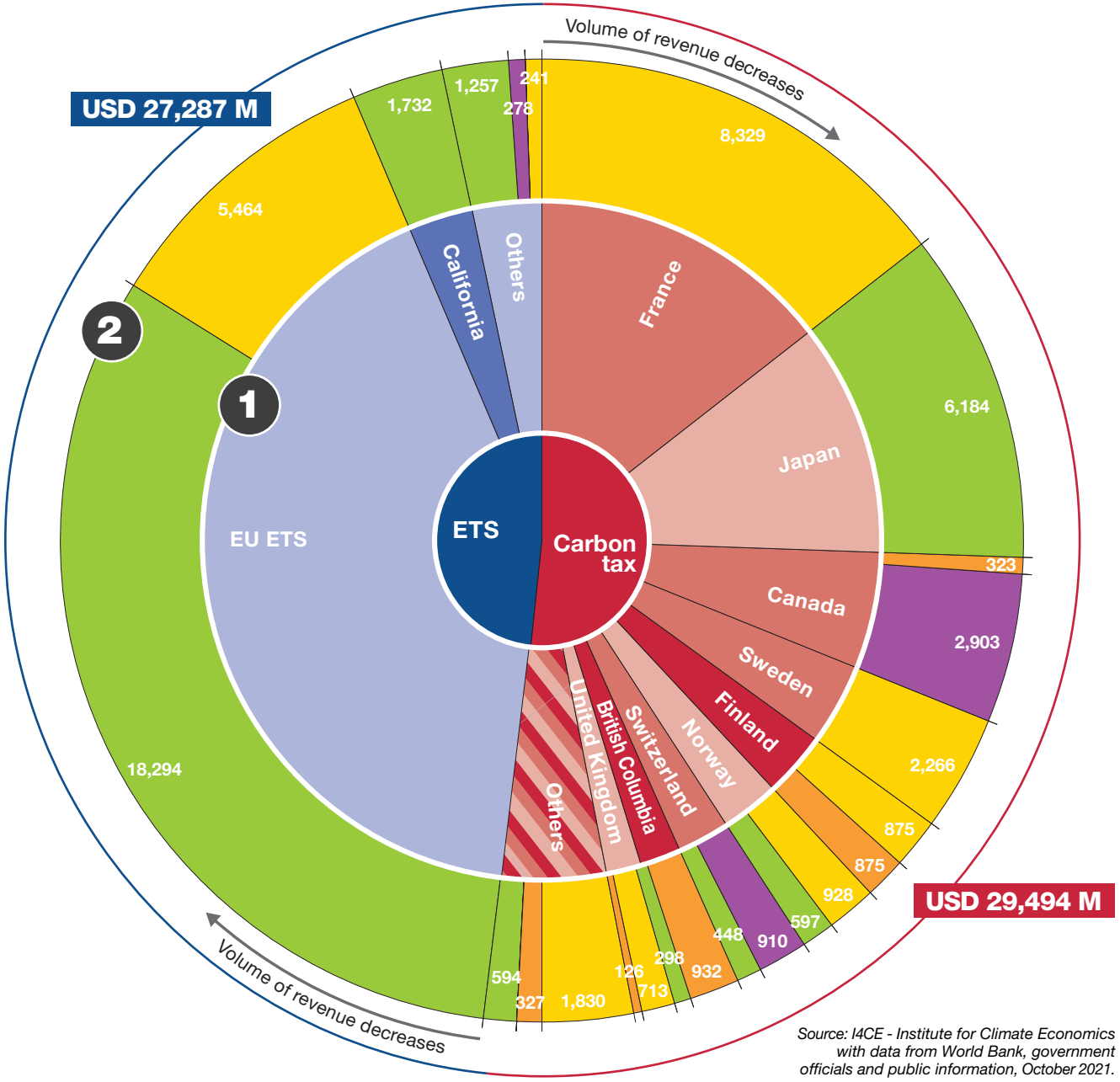
Carbon pricing: use of revenues (in million USD)

How to read this graph: The carbon tax that generates the most revenue is the French tax, followed by Japan, Canada, Sweden… 100% of the revenue from the French carbon tax goes to the general budget. In Japan, 100% of the revenue is earmarked for green projects or infrastructures. Switzerland directs a third of its carbon revenue to a climate fund. the remaining carbon revenue are redistributed evenly to businesses and households through (resp.) a reduction in social security contributions and a rebate on health insurance premiums, categorized as 'Direct transfers'. In British Columbia, carbon revenue is partly returned to low- and middle-income taxpayers through the Climate action tax credit (categorized as 'Tax exemptions'). The remainder supports climate action in local governments and businesses, mainly through the Clean BC program.

The EU ETS generates the most ETS revenue worldwide. A majority of its revenue is earmarked for green projects or infrastructure. The rest goes to the EU general budget. Since 2021, EU ETS revenue also finance an Innovation Fund supporting low-carbon technology.

Revenue evolution (in billion USD)





1 Share of state revenue

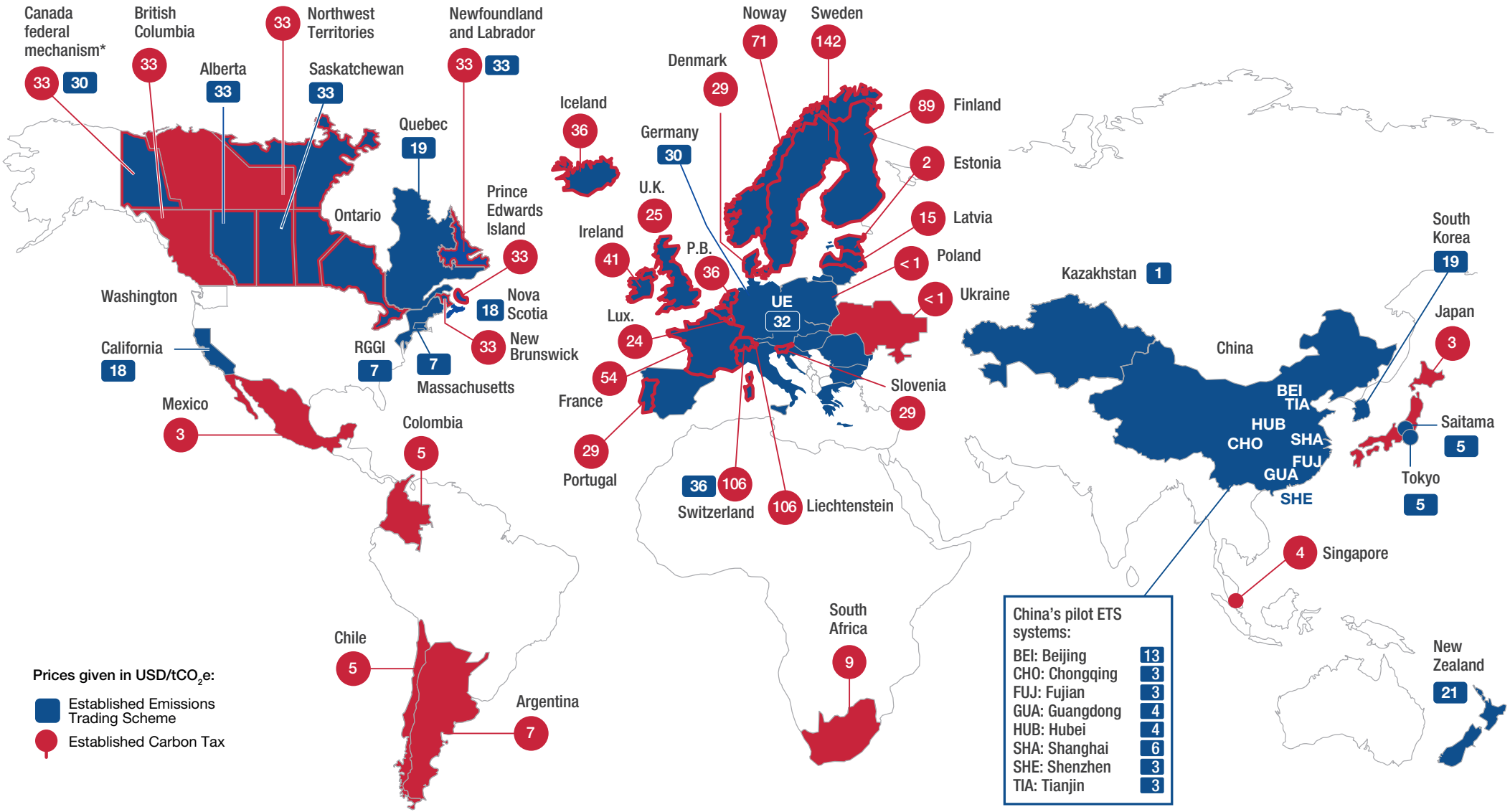
- Carbon tax - Less than 1%
- Carbon tax - 1% to 2%
- Carbon tax - More than 2%
- ETS - Less than 1%
- ETS - 1% to 2%
- ETS - More than 2%

2 Revenue usages

- General budget allocation
- Tax exemptions
- Direct transfers
- Earmarking

Source: I4CE - Institute for Climate Economics with data from World Bank, government officials and public information, October 2021.

Map of explicit carbon prices around the world in 2021



Source: I4CE – Institute for Climate Economics with data from ICAP, World Bank, government officials and public information, October 2021.

SophieBerlioz.fr (REF3489)