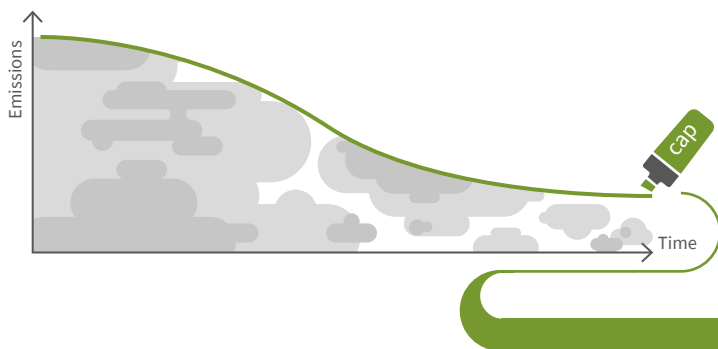


## WHAT IS EMISSIONS TRADING?

*An emissions trading system (ETS) is a market-based instrument that can be used to reduce greenhouse gas (GHG) emissions. It works on the principle of ‘cap and trade’. The government imposes a limit (cap) on total emissions in one or more sectors of the economy. Companies in these sectors need to hold one permit for every ton of emissions they release. They may either receive or buy permits, and can trade them with other companies. This is the ‘trade’ part of ‘cap and trade’.*

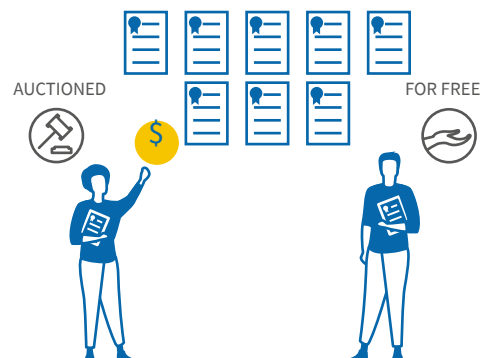


### What is a cap?

The government sets the maximum amount of emissions allowed in the ETS – this is the ‘cap’ part of ‘cap and trade’. The cap should be set in advance and decline over time. It should also be in line with the jurisdiction’s overall emissions reduction target. This provides a long-term market signal so companies can plan and invest accordingly.

### How to distribute permits?

Once the cap is set, the government distributes tradable permits among the companies. One permit represents one ton of GHG emissions. The government can decide to give permits out for free (based on past emissions or performance standards) or to auction them off (see also ICAP ETS Brief #6). How permits are distributed will also affect the way companies manage their emissions.

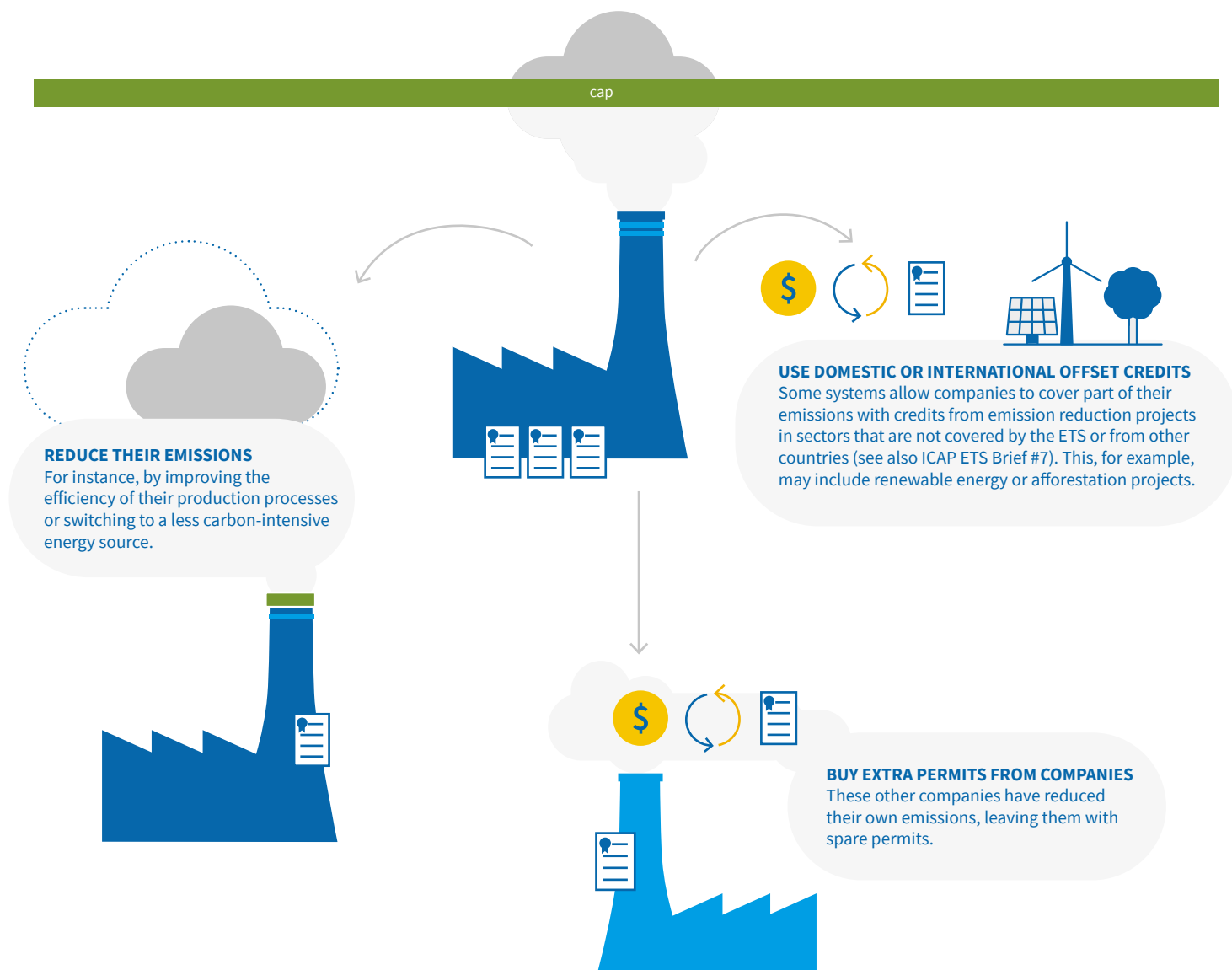


### Who is regulated?

The government also needs to decide which sectors of the economy and GHGs will be included in the system. Theoretically, an ETS with broad coverage of sectors and gases will be most effective. Yet in practice it may be hard to measure and track emissions in some sectors, while other sectors may find it very difficult to reduce their emissions. The power and industrial sectors are included in most systems currently operating around the world. Carbon dioxide (CO<sub>2</sub>), as the most common GHG, is also usually covered by an ETS. Other GHGs include methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and synthetic gases (SF<sub>6</sub>, HFCs and PFCs).

## How can companies manage their emissions?

At the end of a trading period (for instance, one year), each company must submit enough permits to cover its emissions. To do so, companies can choose one or more of the following options:



## How to ensure the ETS runs effectively?

To guarantee the environmental effectiveness of the ETS, companies must monitor and report their emissions to an official authority. These reports must be verified by an independent party to ensure their accuracy. Penalties further ensure that companies comply with the ETS.

Permit transactions among ETS participants are tracked through a registry. Safeguards are in place to help minimize the risk of fraud and manipulation that comes with the financial value of the permits.

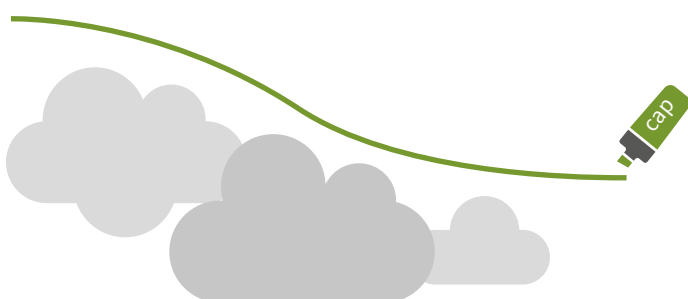
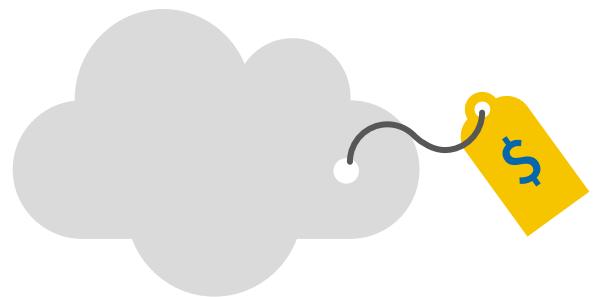
## 7 ARGUMENTS FOR EMISSIONS TRADING

An emissions trading system (ETS) is a market-based instrument that can be used to reduce greenhouse gas (GHG) emissions. It works on the principle of ‘cap and trade’. The government imposes a limit (cap) on total emissions in one or more sectors of the economy. Companies in these sectors need to hold one permit for every ton of emissions they release. They may either receive or buy permits, and can trade them with other companies. This is the ‘trade’ part of ‘cap and trade’. Currently, there are 24 ETSs operating across five continents, with major economies like China having introduced its nationwide system in 2021. In 2021 roughly 16 % of global GHG emissions will be covered by ETS. But just what makes emissions trading such an attractive policy instrument?



### 1. ETS sets a clear price on carbon

By creating a market for GHG emission permits, an ETS puts a clear price on carbon. It means that the costs to society caused by GHG emissions – such as negative effects on public health, damages linked to extreme weather events or the impacts of climate change on natural ecosystems – are made visible and integrated into the price that people pay for their goods and services.

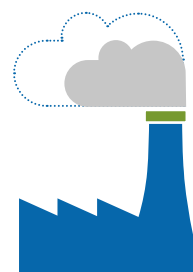


### 2. ETS puts a firm limit on emissions

In an ETS, the government sets a clear emissions target, capping the maximum amount of emissions that are allowed in selected sectors of the economy. This ensures that the desired environmental outcome will be reached. With a steadily declining cap, an ETS also delivers a predictable reduction pathway, which sends a long-term signal for businesses and investors.

### 3. Participating companies can choose how, when and where to reduce emissions

By creating a market for GHG emission permits, an ETS puts a clear price on carbon. It means that the costs to society caused by GHG emissions – such as negative effects on public health, damages linked to extreme weather events or the impacts of climate change on natural ecosystems – are made visible and integrated into the price that people pay for their goods and services.



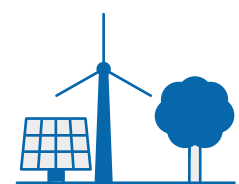
REDUCE THEIR EMISSIONS



BUY EXTRA PERMITS



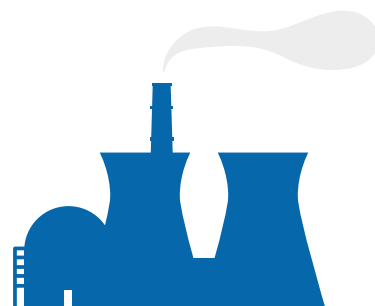
BANK PERMITS



USE OFFSET CREDITS

## 4. ETS fits a variety of economic and political contexts

Emissions trading can be tailored to suit a wide variety of economic and political contexts. There is no one-size-fits-all approach. Systems are currently operating in a range of jurisdictions covering individual cities, states, provinces, countries, and regions, with the design of each system adapted to their unique economic and governance profile.

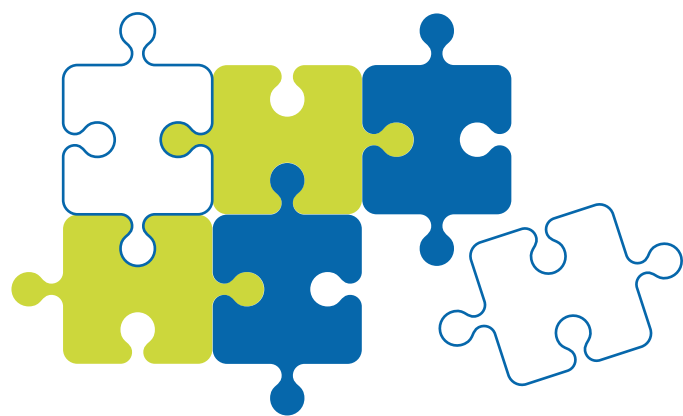
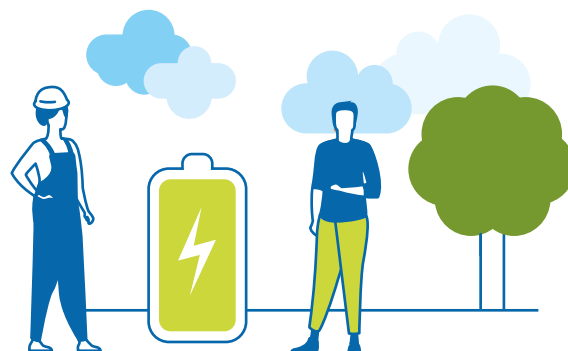


## 5. ETS can provide an additional source of revenue for the government

Emissions trading can be tailored to suit a wide variety of economic and political contexts. There is no one-size-fits-all approach. Systems are currently operating in a range of jurisdictions covering individual cities, states, provinces, countries, and regions, with the design of each system adapted to their unique economic and governance profile.

## 6. Emissions trading provides a range of additional benefits

While the primary goal of emissions trading is to reduce emissions, a well-designed ETS can deliver substantial environmental, economic and social co-benefits. These benefits can include cleaner air, improving resource efficiency, ensuring energy security, fostering technology innovation, and creating jobs.



## 7. ETS can be linked to create a bigger, more efficient carbon market

The 'linking' of two or more systems creates a larger carbon market, which opens up more (and potentially cheaper) emission reduction options. When systems are directly linked, permits can be used interchangeably for compliance in both systems (see also ICAP ETS Brief #4).

## EMISSIONS TRADING AT A GLANCE

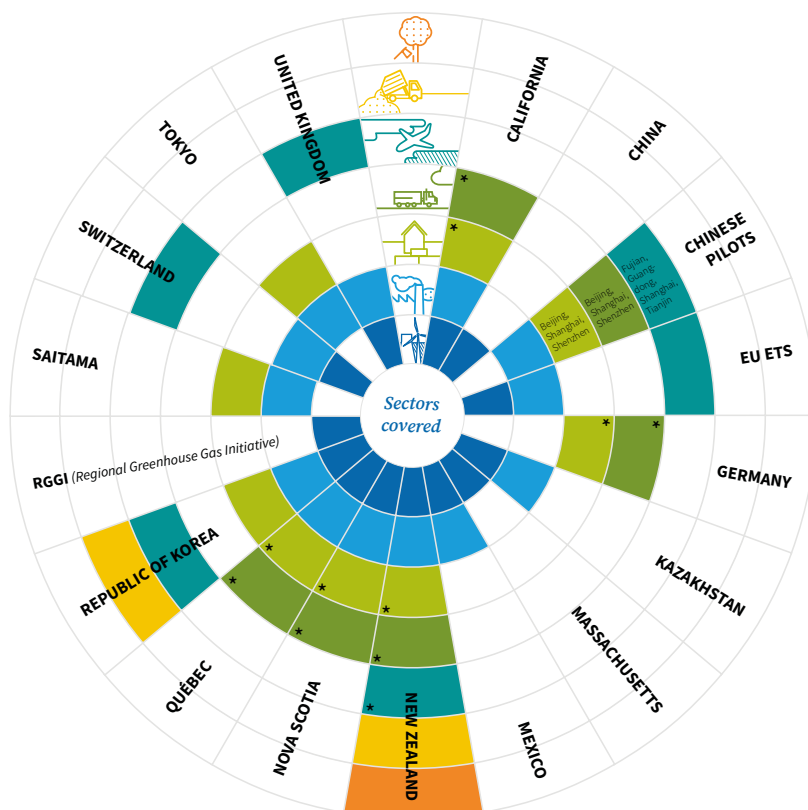
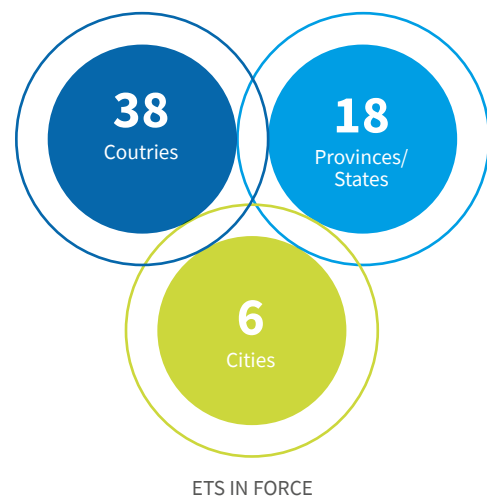
An emissions trading system (ETS) is a market-based instrument that can be used to reduce greenhouse gas (GHG) emissions. It works on the principle of 'cap and trade'. The government imposes a limit (cap) on total emissions in one or more sectors of the economy. Companies in these sectors need to hold one permit for every ton of emissions they release. They may either receive or buy permits, and can trade them with other companies.

ALMOST 1/3 OF THE GLOBAL POPULATION LIVES UNDER AN ETS IN FORCE



### Emissions trading spreads worldwide

The first major emissions trading system (ETS) for greenhouse gases – the European Emissions Trading System (EU ETS) – was established in 2005. To date, there are 24 ETSs in place across five continents which produce almost 54 % of global wealth (GDP). With over a dozen more governments considering or having already scheduled an ETS, emissions trading has emerged as a key instrument to cost effectively decarbonize our economies.



### Each system is unique

Governments can tailor their ETS to suit local conditions, so each system presents its own unique approach to emissions trading. Currently, systems operate at a range of administrative levels, from megacities such as Tokyo, to U.S. and Canadian provinces, as well as at the supranational level like the EU. Design features differ between systems, as do the greenhouse gases and economic sectors they cover. While most systems currently include the industrial and power sectors, an ETS can also be designed to reduce emissions in other sectors of the economy (see graphic).



For further explanation and details see ICAP Status Report 2021.

\* indicates which sector represents upstream coverage

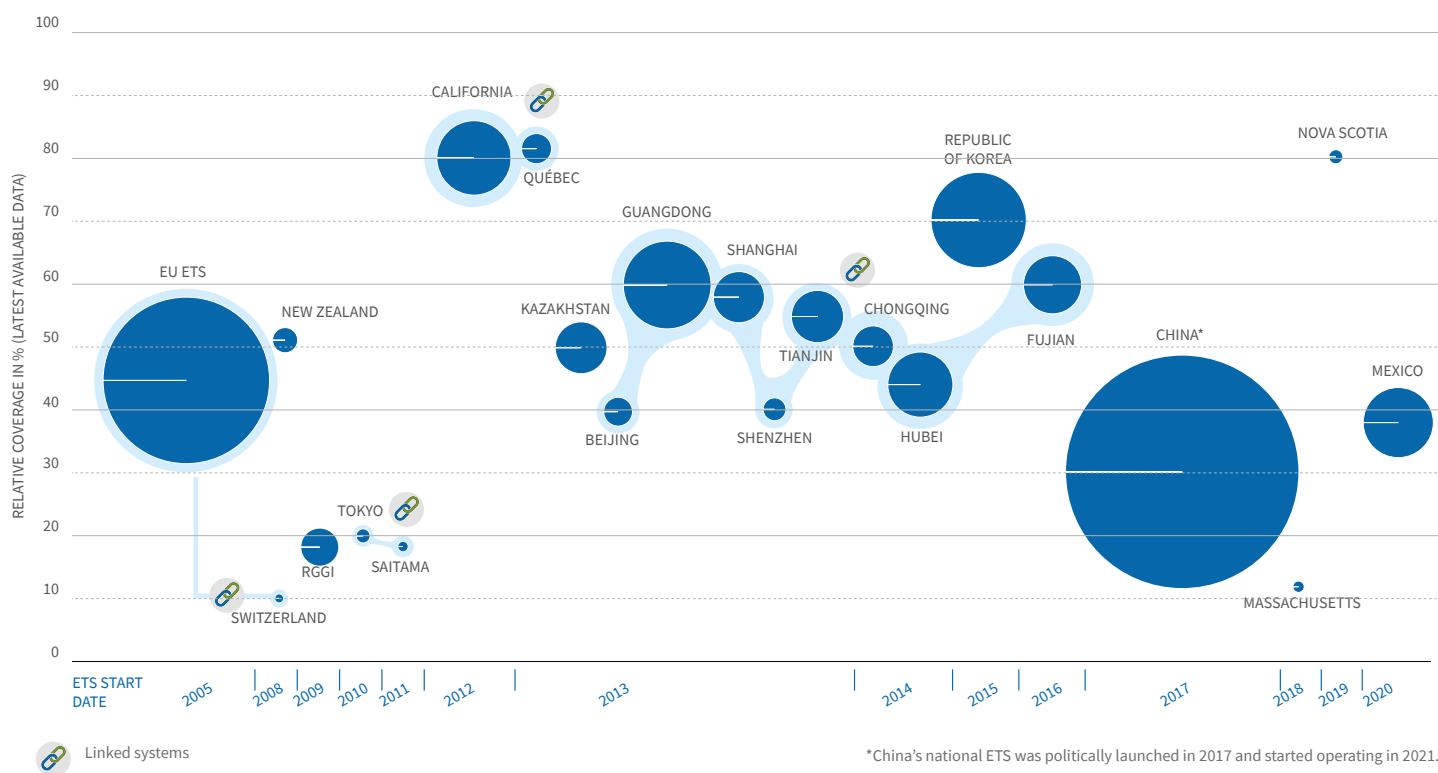
## Existing systems are maturing and linking

The first generation of pioneer ETSs have been improved and refined based upon earlier lessons learned. The European Emissions Trading system has undergone a major reform over the past few years, including the introduction of a new Market Stability Reserve (MSR) and a more steeply declining emissions cap. The goal of the new reserve is to address the allowance surplus resulting from the downturn of emissions during the financial crisis in 2008 and to better protect the system against major shocks. Northeastern and Mid-Atlantic States participating in the Regional Greenhouse Gas Initiative (RGGI) succeeded with several review processes, and have agreed on ambitious downward adjustments of their emission cap. In the Southern Hemisphere, New Zealand introduced new measures to its ETS in 2018 as part of the second review of its system.

From 2020, it will start with selling emissions allowances through auctioning schemes, with a view to ensuring overall price stability in the system.

Another trend in maturing ETS is linking, whereby two or more jurisdictions connect their carbon markets, allowing permits to be bought and sold across systems. In 2014, California and Québec successfully linked their systems. In 2015, transport fuels were included in the joint system and their carbon market doubled in volume; it now covers almost 80% of their total emissions. Furthermore, Tokyo, which established the world's first city-level ETS, connected their system with the ETS of the province of Saitama. Finally, the EU and Switzerland linked their systems in 2020.

THE SIZE OF THE BUBBLES GIVES A ROUGH ESTIMATE OF THE SIZE OF THE SYSTEM BASED ON THE AMOUNT OF EMISSIONS COVERED. THE BUBBLE IS CENTERED AT THE PROPORTION OF THE JURISDICTION'S EMISSIONS THAT ARE REGULATED.



## New systems are emerging

Meanwhile, Asia has recently become a hotspot for the development of new ETS. In 2015, the Republic of Korea became the second country after Kazakhstan to launch a national ETS in Asia. The Korean system is now the second largest in the world after the EU-ETS. At the same time, China is using its experience from the seven pilot ETSs to prepare for its national carbon market. When fully operational, China will be home to the world's largest ETS.

Elsewhere, in the United States, interest in emissions trading has continued on state level, with New Jersey, Virginia and potentially other states set to join the RGGI market and others, like Oregon, considering their own systems. In Canada, Nova Scotia launched its ETS in January 2019 after final cap-and-trade program regulation was passed in 2018.

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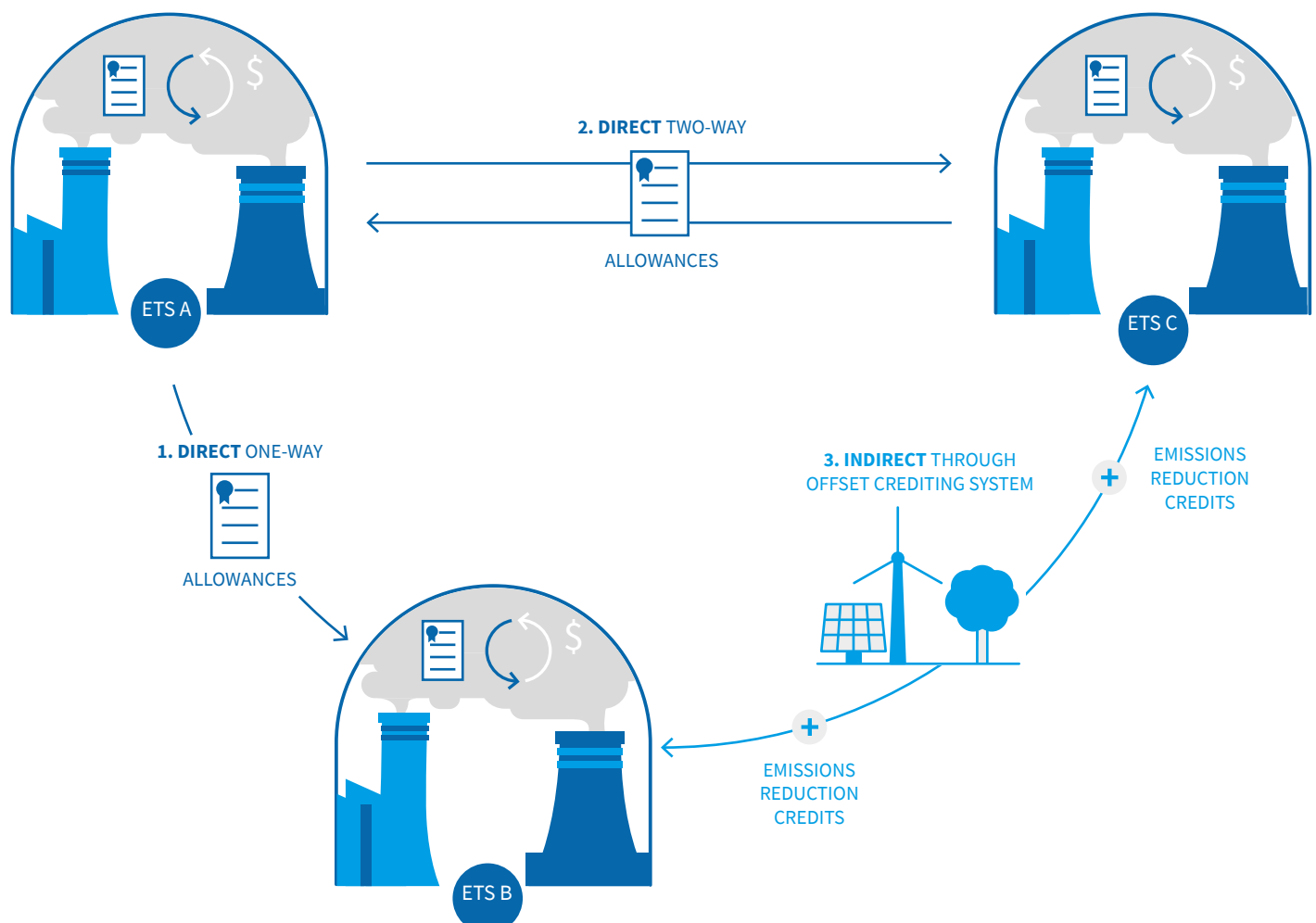
## ON THE WAY TO A GLOBAL CARBON MARKET: LINKING EMISSIONS TRADING SYSTEMS

*An emissions trading system (ETS) is a market-based instrument that can be used to reduce greenhouse gas (GHG) emissions. It works on the principle of ‘cap and trade’. The government imposes a limit (cap) on total emissions in one or more sectors of the economy. Companies in these sectors need to hold one permit for every ton of emissions they release. They may either receive or buy permits, and can trade them with other companies. This is the ‘trade’ part of ‘cap and trade’.*



A key advantage of emissions trading systems (ETSs) is that they can be linked up, creating larger, more liquid carbon markets. Linking enables companies that operate under an ETS to use permits from another system for compliance. Once linked, prices in the different systems will converge, creating one common permit price.

Linking can take different forms. One-way linking allows companies in system A to buy permits generated in system B. With a two-way link, permits can flow in both directions across the linked market. Links can also happen indirectly via other market mechanisms, for example, if both ETSs are linked to the same offset crediting system such as the Clean Development Mechanism (CDM).



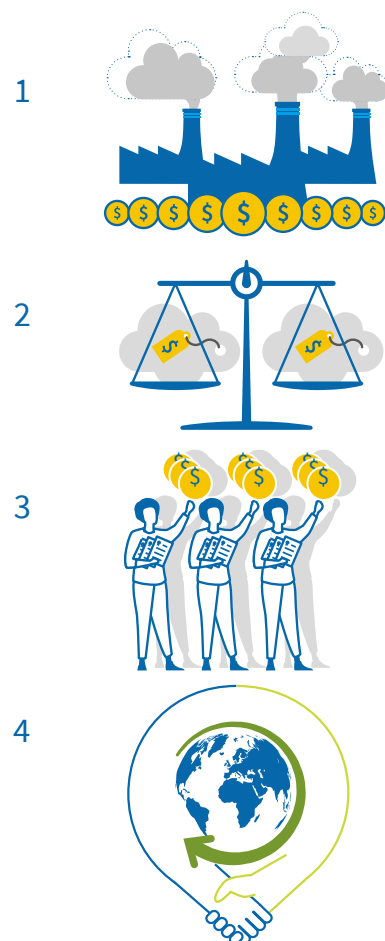


## Why link?

One of ICAP's core objectives is to help alignment and linking of emissions trading systems, with a view to moving towards a global carbon market in the long term. Linking has a number of benefits:

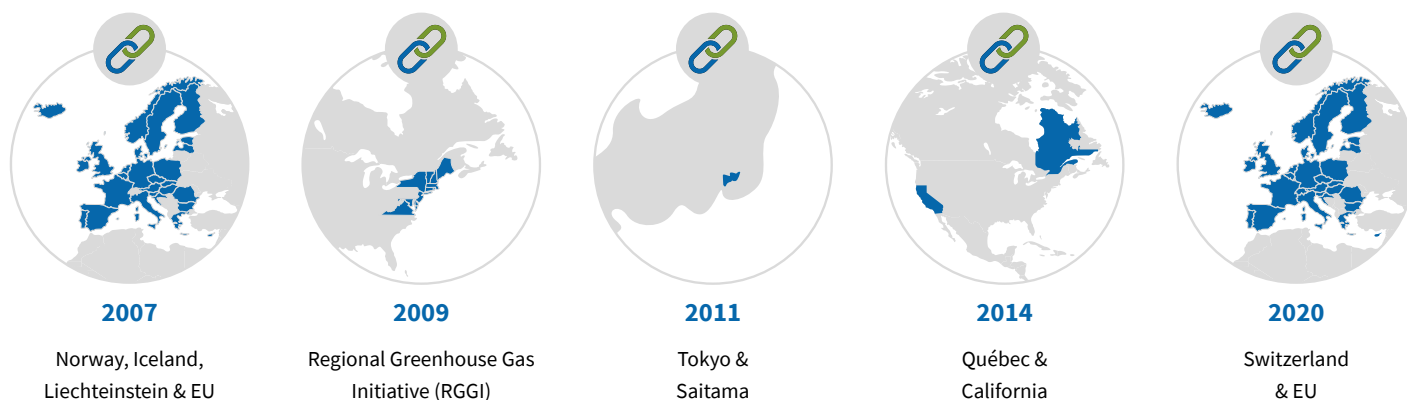
- 1 Linking opens up access to more and potentially cheaper emissions reduction options. This decreases overall mitigation costs and may allow governments to adopt more ambitious climate targets.
- 2 Linking reduces competitiveness concerns. It levels the playing field for companies across the linked market, which now face the same carbon price.
- 3 Linking increases the number of market participants. With more actors buying and selling permits, trading is more efficient. A bigger carbon market is also better at absorbing shocks, such as sudden changes in commodity prices or exchange rates.
- 4 Linking can demonstrate climate change leadership and encourages international cooperation.

However, linking is not without challenges. Governments may need to adjust their ETS design in order to link and need to be ready to give up some sovereignty in managing the joint market. Furthermore, there may be concerns that companies, by buying permits from the other system, are effectively financing mitigation activities abroad, rather than taking climate action at home.



## Linking around the world

In 2014, California and Québec linked their ETS. Ontario briefly joined their carbon market, but exited again after a change in government. In Japan, Tokyo and the province of Saitama have been operating a joint carbon market since 2011. The European carbon market is also expanding: after the accession of Norway, Iceland and Liechtenstein to the European Union ETS in 2007, the EU ETS will link to the Swiss system from 2020. Last but not least, the ten states of the Regional Greenhouse Gas Initiative (RGGI) in the North East of the U.S. have been operating a joint carbon market since 2008, and more states seem set to join in the coming years.

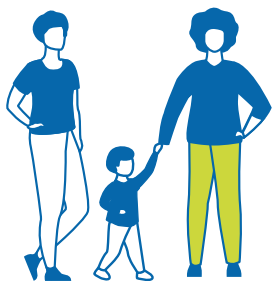




## FROM CARBON MARKET TO CLIMATE FINANCE: EMISSIONS TRADING REVENUE

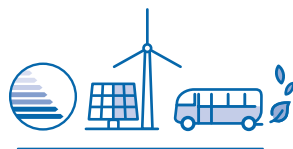
### Auctioning allowances has benefits ...

In an emissions trading system (ETS), the government can distribute emissions permits for free, auction them, or combine both approaches. Auctioning is an efficient way to get permits to those who value them most. It generates public revenue and provides an incentive for companies to take early action against climate change, as the more companies reduce their emissions, the fewer permits they need to buy. Auctioning may also be seen as fair because it ensures that regulated companies pay for their emissions.



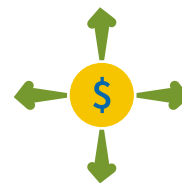
#### FINANCIAL ASSISTANCE TO DISADVANTAGED GROUPS

Governments can support low-income households or vulnerable communities to counter rising energy costs and to facilitate the transition to a low-carbon economy.



#### FUND CLIMATE ACTION

Governments can invest in adaptation, renewable or other low-carbon technology, energy efficiency, clean transport, waste and forestry.



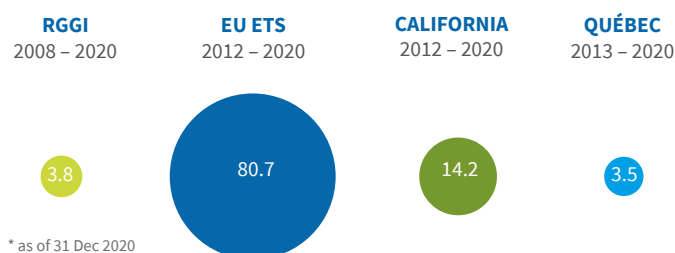
#### CONTRIBUTION TO THE PUBLIC BUDGET

Governments can use ETS revenue to reduce taxes, finance other policy priorities or to reduce the budget deficit.

### ... And generates significant revenue

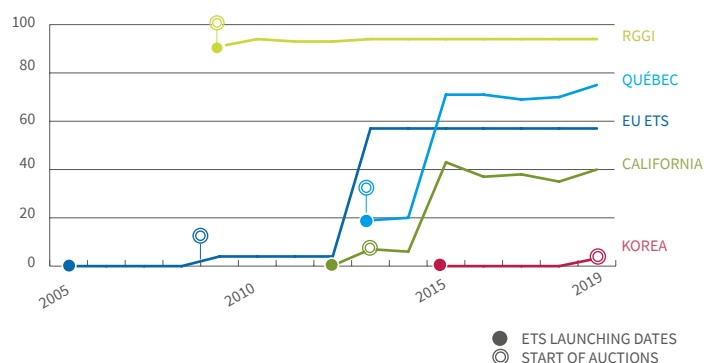
Most ETSS already do, or intend to, auction a share of their permits, and many plan to increase that share over time. The amount of revenue depends on the number of auctioned permits and the carbon price. Towards the end of 2019, ETS jurisdictions had raised more than USD 78 billion through auctioning.

#### TOTAL AUCTION REVENUES, USD BILLION\*



Korea (2016–2020) raised USD 509 million, Switzerland (2013–2020) USD 45 million, Massachusetts (2018–2020) USD 27 million, Nova Scotia (2020) USD 21 million and Chinese Pilots (2013–2020) USD 215 million in auction revenues.

#### PERCENTAGE OF TOTAL AUCTIONED PERMITS



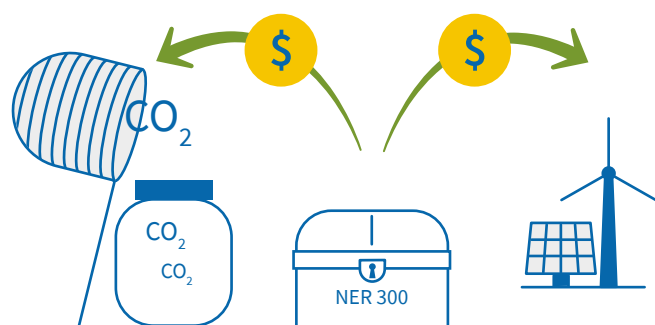
## Auctioning in an ETS — a snapshot across 3 systems

### RGGI – A PROGRAM THAT AUCTIONS ALMOST 100% OF ITS PERMITS

The fact that the Regional Greenhouse Gas Initiative (RGGI) generates revenue, which is reinvested into the community, has helped build support for the program. From 2008 through 2017, RGGI states spent 70% (USD 2.4 billion) of their auction proceeds on energy efficiency, clean and renewable energy, greenhouse gas abatement, and direct bill assistance by returning money to consumers as a rebate on their energy bills. These investments have stimulated the local economy and created jobs through developing low-carbon technology, promoting energy efficiency programs and increasing the use of renewable energy.



\*a job-year is one year of full-time employment; jobs such as efficiency audit performers, energy efficiency measures installers or trainers on energy issues



### EU ETS – a focus on climate funding

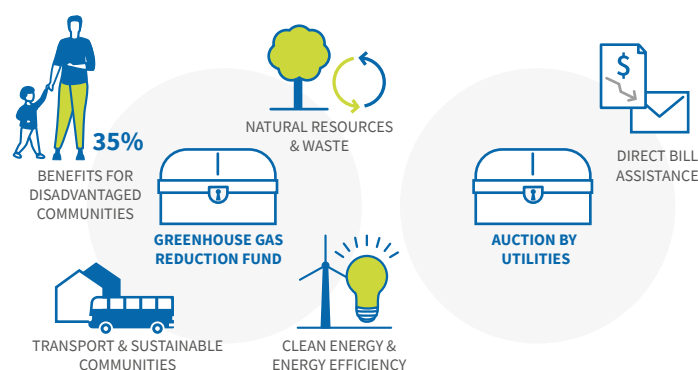
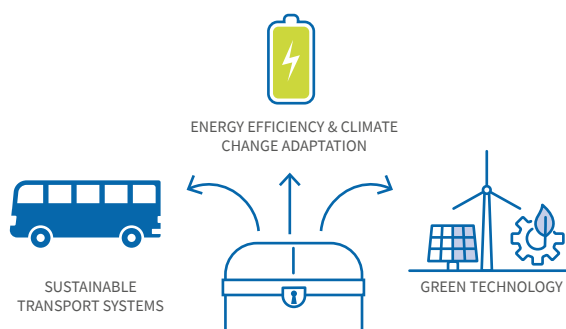
In the European Union (EU), each member state decides how to use their auction revenue, but at least 50% should go towards climate action. The EU also funds one of the world's largest programs for low-carbon innovation: the NER 300 has spent more than 2.3 USD billion since 2012 on cutting-edge renewable energy technologies and carbon capture and storage projects. From 2021 it will be replaced by the Innovation and Modernization Funds which will finance low-carbon technology innovation, modernization of energy systems and energy efficiency in 10 lower-income member states.

### California and Québec – joint auctions under individual administrations

In 2014, California and Québec linked their systems and began to run joint auctions. The revenue is collected separately:

**QUÉBEC:** Québec's revenue goes to the Green Fund which supports measures such as developing and using green technology, sustainable transport systems, energy efficiency and climate change adaptation.

**CALIFORNIA:** Most of California's revenue goes to the Greenhouse Gas Reduction Fund (GGRF), of which at least 35% must benefit low-income households or communities. The fund also invests the proceeds in projects that reduce GHG emissions. Investments through the GGRF are generated through state-owned allowances and referred to as California Climate Investments. Additional revenue from allowances allocated to utilities but auctioned on their behalf must benefit their ratepayers or reduce emissions.



**SOURCES AND DISCLAIMERS:** Figures from the European Commission, ICAP Status Report, Québec Ministry for the Environment and the Fight against Climate Change, California Air Resources Board, RGGI, EEX, ICE. US dollars were converted at the annual average exchange rates published by the Bank of Canada and <https://www.oanda.com>. For the Québec cap-and-trade system, joint auctions involve currency conversion for part of the proceeds. The rate and transaction fees on the date of conversion can affect the amount deposited to the Green Fund. As a result, the product of the number of permits sold and the settlement price may slightly differ from the actual amount deposited. For the California cap-and-trade system, the estimated percentage of auctioned permits and total auction revenue account for state-owned permits only. The estimated percentage of auctioned permits for the California and Québec cap-and-trade systems are calculated based on the vintage year, not by the year when permits were or would be actually auctioned.

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## ALLOCATION: HOW EMISSIONS PERMITS ARE DISTRIBUTED

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### Why allocation matters

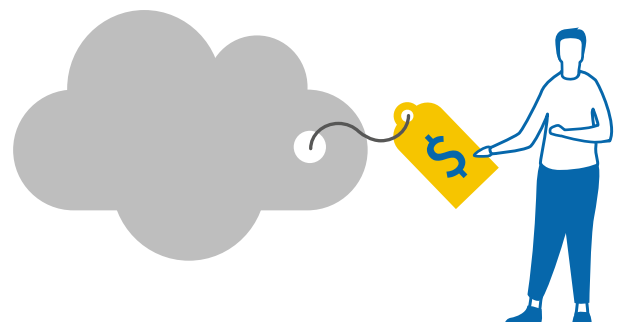
The first major emissions trading system (ETS) for greenhouse gases – the European Emissions Trading System (EU ETS) – was established in 2005. To date, there are 20 ETSs in place across five continents and covering 27 jurisdictions which produce almost 40 % of global wealth (GDP). With over a dozen more governments considering or having already scheduled an ETS, emissions trading has emerged as a key instrument to cost effectively decarbonize our economies.

### The pros and cons of auctioning and free allocation

Auctioning permits is considered a straightforward and efficient way to get permits to those who value them most. Furthermore, it generates revenue, rewards early action, and promotes an active carbon market by revealing a carbon price and encouraging trading (for more on auctioning and ETS revenue, see ICAP ETS Brief #5).

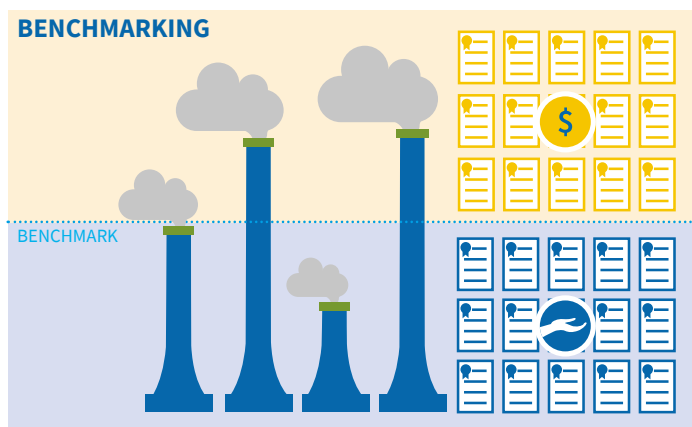
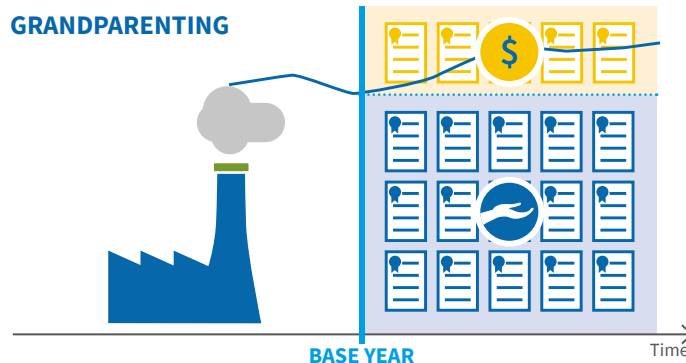
However, free allocation may also be warranted, especially at the beginning of an ETS. Allocating allowances for free can compensate entities for their existing carbon intensive infrastructure and processes, which may smooth the transition into an ETS. Free allocation might also be used to protect companies from the potential loss of competitiveness and the risk of carbon leakage. In theory, if companies compete in markets outside of the ETS, there is a risk that production and investment could shift to areas with laxer climate regulations, which would harm the local economy without reducing emissions. Free allocation can compensate these vulnerable sectors for their carbon costs, allowing them to continue to be competitive.

Even when entities are allocated permits for free, they still have an incentive to invest in low-carbon technology. If they reduce their emissions they can sell the extra permits, whereas if they increase their emissions they will face extra costs. The strength of this incentive is determined by the method of free allocation.



## Different methods of free allocation

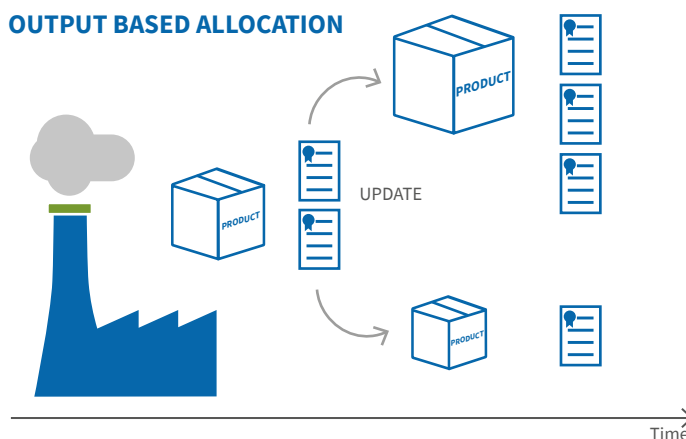
**GRANDPARENTING** – companies receive free allowances based on their historical emissions from a specified period. Grandparenting has the advantage of being relatively simple with moderate data requirements. However, it may reduce the need to trade in early years and can penalize companies that invest in emission reductions early on, as these reductions may effectively lower their ‘historical emissions baseline’ and cause them to receive fewer permits.



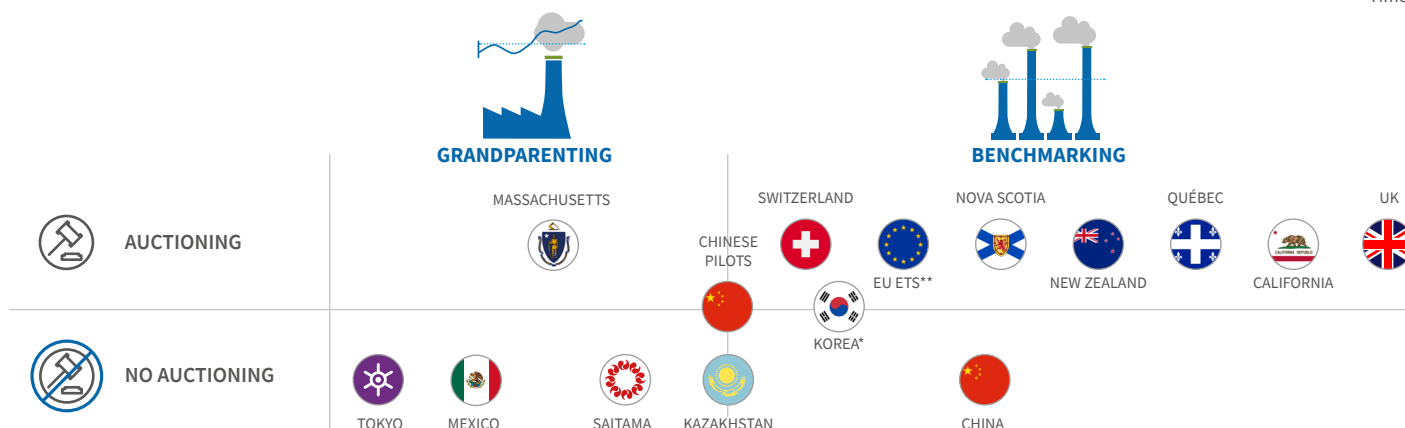
**BENCHMARKING** – companies receive free allowances depending on a set of performance standards, based on the emissions intensity of a product or across a sector. Benchmarks may address fairness concerns and reward early action. However, benchmarking requires high quality data and a thorough understanding of (often complex) industrial processes.

A common method of benchmarking in an ETS is to establish fixed performance standards for certain products or sectors (Fixed Sector Benchmarking). Benchmarks may be fixed at the average performance level, at the best practice level, or a value in between (e.g., the average of the top 10% best performers).

Another method of benchmarking is to update allocation according to the actual output of the company or installation (Output Based Allocation, OBA). This method targets the risk of leakage for vulnerable companies. However, it can also dampen the carbon price incentive for them.



Allocation methods vary across ETS jurisdictions and sectors depending on their circumstances. Auctioning is often used for the power sector, while free allocation has been granted to industrial sectors. Typically, auctioning is limited in the early phases of an ETS but its share tends to grow as the system matures. At least some level of auctioning is considered important to support an active carbon market.



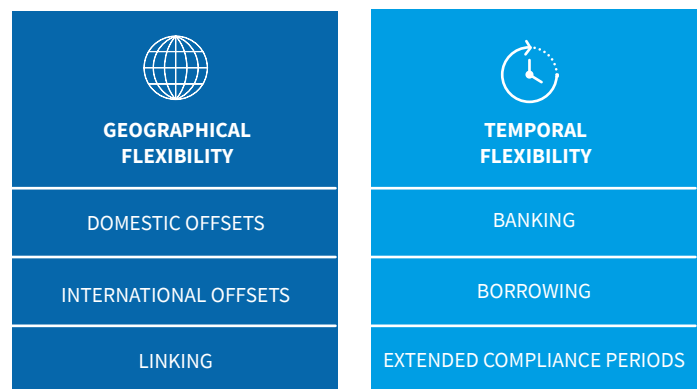
\* Korean ETS uses benchmarking for cement, refinery and domestic aviation and grandparenting for the other sectors.

\*\* EU ETS at the current phase is using benchmarking for its free allocation sectors, while in previous phases used mainly grandparenting. Currently, RGGI is the only system that does not use free allocation: almost all permits allocated via auctioning.

## FLEXIBILITY IN EMISSIONS TRADING

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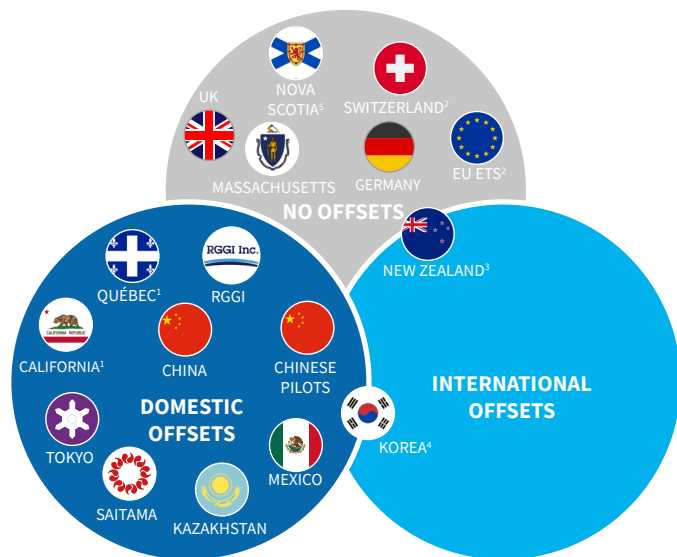
With an ETS, it does not matter where or when emissions are reduced – as long as they are reduced in line with climate targets. Following this principle, an ETS guarantees that a specific climate target will be reached at the lowest cost to the economy. It is inherently flexible, as companies may choose to reduce emissions themselves or buy permits from others that have done so. Additional flexibility measures give companies even more options: offsets and linking with other systems give regulated entities geographical flexibility (for more on linking, see ICAP ETS Brief #4) while banking and borrowing, and longer compliance periods provide temporal flexibility.



### Offsets – reducing emissions outside of the ETS

Offsets are emissions reductions from activities outside the scope of the ETS. There are two main types of offsets – domestic offsets generated within countries, and international offsets. Before offset credits are issued, they must undergo a robust process to ensure the reductions are real and additional – that they would not have happened anyway. Firms can then purchase these credits to meet part of their obligations under the ETS. Typical offset projects include renewable energy, energy efficiency, waste management, agricultural and forestry projects. As offsets come from outside of the ETS, they increase the emissions allowed within the ETS (the cap). Therefore, jurisdictions usually limit the number of offsets that may be used, to ensure that most abatement takes place within the ETS sectors. Furthermore, to maintain the quality of offsets used, they are often limited by type or origin.





OFFSET PROGRAMS AROUND THE WORLD

## Why use offsets?

Allowing offsets in an ETS provides an additional source of low-cost abatement options for companies. In addition, offsets create benefits outside of the ETS: the possibility to generate and sell offsets creates incentives to reduce emissions in other sectors and regions. Internationally sourced offsets provide financial resources for green development in regions where mitigation funding may be scarce. Furthermore, as offsets make it cheaper to achieve targets they may encourage policy-makers to set a more ambitious cap. However, given concerns about the environmental integrity of some types of offsets like the Clean Development Mechanism (CDM), the trend recently has been towards a more restrictive approach to offsets or a focus on domestic projects rather than international ones.

<sup>1</sup> California and Québec allow offsets mutually sourced from linked jurisdictions

<sup>2</sup> The Swiss and EU ETS no longer use offsets from 2021

<sup>3</sup> New Zealand may readmit international offsets from high integrity sources as early as 2021

<sup>4</sup> Korea allows domestic credits as well as international CDM credits developed by Korean companies

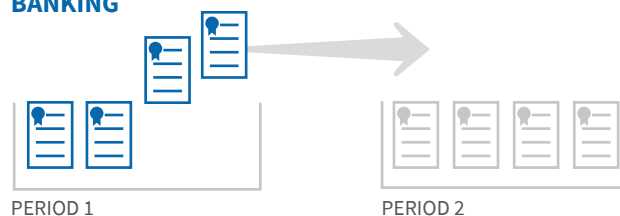
<sup>5</sup> Nova Scotia's cap-and-trade legislation includes provisions for an offset program, however as of 2020 an offset program it is not yet operational

## Temporal flexibility

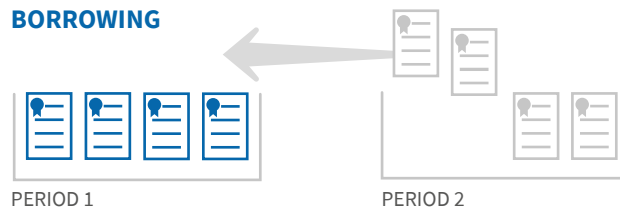
Temporal flexibility measures allow entities to manage their emissions in the most cost-effective way over time. With banking, entities can save up permits issued in one period for use in subsequent periods. Borrowing works the other way around. Entities postpone buying permits or reducing emissions (for instance until technology becomes cheaper) by borrowing permits from future periods to use in the current period. Longer compliance periods also give companies flexibility as to when they can buy permits or reduce emissions.

All these features help reduce price volatility and smooth out the carbon price over time, as entities can buy permits when they are cheaper – thus causing the price to rise – and sell or borrow permits when prices are high.

### BANKING



### BORROWING



### EXTENDED COMPLIANCE PERIOD



## Banking and borrowing – setting the right incentives

All existing ETSs allow banking. It may help create private sector groups with a strong interest in ambitious future targets in order to maximize the value of their permits. However, unlimited banking can carry forward the effects of economic shocks such as an oversupply of permits. By contrast, most

jurisdictions limit borrowing or prohibit it completely as it can give companies an incentive to delay reducing emissions, making it harder to reach short-term targets. It may also create groups that would benefit from abandoning climate policy.

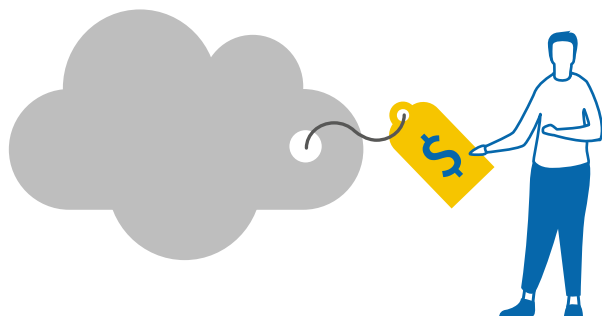
## EMISSIONS TRADING AND CARBON TAX: TWO INSTRUMENTS, ONE GOAL

*Emissions trading systems (ETS) and carbon taxes are two well-established carbon pricing instruments for cost-effective greenhouse gas (GHG) emissions reductions. An ETS works on the principle of ‘cap-and-trade’. The government imposes a limit (cap) on total emissions and companies are obliged to hold one permit for every tonne of emissions they release. They may receive, buy or trade permits and their value represents the carbon price. With a carbon tax, the government sets a tax rate and companies covered by the tax are obliged to pay this amount for every tonne they emit.*

ETS



CARBON TAX



### What do they have in common?

**1. THEY PUT A PRICE ON CARBON:** Both ETS and carbon taxes follow the polluter pays principle. They impose an explicit price on carbon, encouraging producers and consumers to internalize part of the social cost of GHG emissions. This helps to make low-carbon alternatives more attractive, changing consumption patterns and supporting low-carbon investments.

**2. THEY ARE COST EFFECTIVE:** A carbon price does not tell people what actions they must take to reduce emissions. Rather, individuals and firms decide how best to respond to the price. This means that across the economy, both an ETS and a carbon tax can achieve more reductions for the same cost as other climate policies.



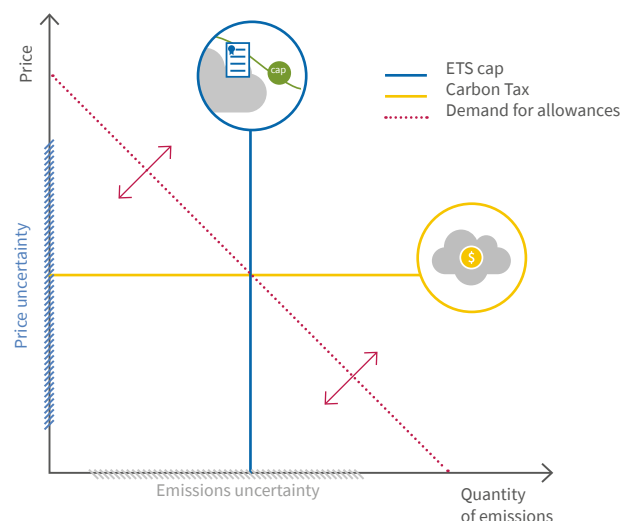
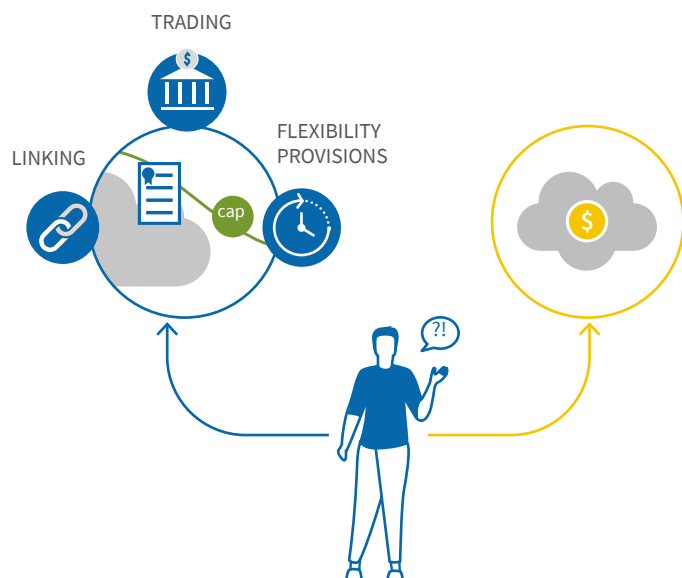
**3. THEY CAN GENERATE REVENUE:** Like other taxes, a carbon tax will raise public revenue, even as it discourages polluting behavior. An ETS that auctions allowances can also generate revenues. Carbon pricing revenues can be used, for example, to invest in climate and energy measures, finance tax reforms, pay down public debt, support social programs, or to compensate households.





## What are their key differences?

**1. QUANTITY CERTAINTY VS. PRICE CERTAINTY:** By setting a cap, an ETS determines the total amount of emissions and thereby assures the mitigation outcome of the policy. As a result, the carbon price in an ETS fluctuates depending on the demand for allowances. The price may be higher when the economy is booming and lower during a downturn. On the other hand, a carbon tax provides price certainty but the resulting mitigation outcome cannot be set.



**2. SIMPLICITY VS FLEXIBILITY:** A carbon tax can be easier to implement as it uses the established channels of the tax system and does not require new infrastructure for trading allowances. However, ETS provides more flexibility: for example, provisions such as offsets, banking and limited borrowing give covered entities options for when and where to reduce emissions. Finally, there is the potential to extend ETS across borders by linking with other systems, which is not possible with a carbon tax.

## Carbon pricing in practice

The choice between an ETS and a carbon tax depends on a jurisdiction's policy preferences and circumstances. The two are also not mutually exclusive: several jurisdictions have complementary ETS and carbon taxes covering different sectors. Others have implemented a carbon tax as a step towards establishing an ETS.

ETS ONLY*						ETS AND CARBON TAX			CARBON TAX ONLY**				
CHINA	CALIFORNIA	CHINESE PILOTS	EU ETS X 17	KAZAKHSTAN	GERMANY*	SWITZERLAND	EU ETS X 14	UK	ARGENTINA	BRITISH COLUMBIA	CANADA**	CHILE	
KOREA	NEW ZEALAND	QUÉBEC	NOVA SCOTIA	RGGI Inc.	MASSACHUSETTS	TOKYO	SAITAMA	MEXICO	COLOMBIA	JAPAN	SINGAPORE	SOUTH AFRICA	UKRAINE

\* As of 2021

\*\* Canadian Federal 'backstop' measure applied to provinces not already implementing carbon pricing. As of October 2020 this includes Alberta, Manitoba, New Brunswick, Northwest Territories, Nunavut, Ontario, Prince Edward Island, Saskatchewan, Yukon

## The best of both worlds

Both instruments have evolved to become more flexible, adjustable and stable. Hybrid approaches have emerged over time, such as price floors and ceilings in an ETS. Conversely, emitters may be able to submit offset certificates instead of paying the carbon tax. With a range of design options available, carbon pricing – no matter what kind – is a key tool for jurisdictions to lower their emissions cost effectively.

**ABOUT THE INTERNATIONAL CARBON ACTION PARTNERSHIP:** ICAP is an international forum for national and subnational governments focusing on best practices in emissions trading. Its work centers on three main pillars: technical dialog, knowledge sharing and capacity building. For more information see the [ICAP website](#) and its [ETS map](#) and [Allowance Price Explorer](#) or follow us on [Twitter @ICAPSecretariat](#).