



**International Carbon  
Action Partnership**

# EMISSIONS TRADING WORLDWIDE

*Practitioner Insights*

*Status Report 2022*

# Emissions Trading Worldwide

## *International Carbon Action Partnership (ICAP) Status Report 2022*

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# Practitioner Insights



# China's national ETS

## Underway with a smooth start, yet enhancements are needed to achieve dual climate goals

**Qian Guoqiang,  
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On 16 July, 2021, in the first nation-wide action to directly limit carbon emissions from enterprises, China's national ETS officially commenced trading. After almost a decade of continuous efforts to establish a national carbon pricing mechanism, growing from pilots to a national scheme, China's national ETS has set off to a smooth start. The market began with an initial allowance price of CNY 48.00 (USD 7.44)/tonne, which then rose modestly throughout the year. In the first compliance period, only the power sector was covered, with some limits on compliance. Even so, more than 2,160 power companies faced obligations under the national ETS, in total covering about 4.5 billion tonnes of CO<sub>2</sub> emissions per year. Eventually, China's national ETS is expected to grow into the world's largest carbon market in terms of value, with a potential transaction value of over CNY 100 billion <sup>1</sup>(USD 15.5 billion), providing a nation-wide price signal and channeling financial resources to sectors that are crucial for the realization of China's dual goals: peaking emissions before 2030 and ultimately reaching long-term carbon neutrality before 2060.

### CHINA NATIONAL ETS: PROGRESS IN 2021

The first compliance period of the national ETS closed at the end of 2021, with a compliance rate of 99.5%, measured in terms of surrendered allowances. During the first compliance period, trading of spot allowances was limited to covered entities only. Though other types of market participants, such as financial institutions, were excluded from the market, they are expected to gradually be allowed to participate in the future. All of the required allowances were distributed to power companies by the government for free, based on historical output and benchmarks.<sup>2</sup> The first compliance period also featured an upper limit on compliance obligations that was designed to favor gas-fired power plants and ease the compliance 'burden' of all covered entities.

China's offset mechanism, the China Certified Emission Reduction (CCER) system, was thrown a lifeline in 2021 when the Ministry of Ecology and Environment (MEE) issued a notice allowing covered entities to use CCERs to offset up to 5% of their annual verified emissions for compliance purposes, with no restrictions on project type or vintage. The CCER mechanism was initially launched in 2013 but suspended operation four years later in 2017. This meant that the CCER mechanism accumulated tens of millions of offset credits that were unused by the time the national ETS was launched in 2021. The announcement by MEE opened the door to the accumulated CCER credits and enabled the mechanism to play an important role in compliance. The price of CCERs rose sharply after the announcement, rising to near parity with the price of allowances.

By the end of December 2021, the national ETS had been running for 114 trading days, with a cumulative transaction volume of 179 million allowances and a cumulative transaction value of CNY 7.66 billion (USD 1.2 billion). The closing price on 31 December 2021 was 54.22 CNY (USD 8.40), an increase of 12.96% from the starting price in July.

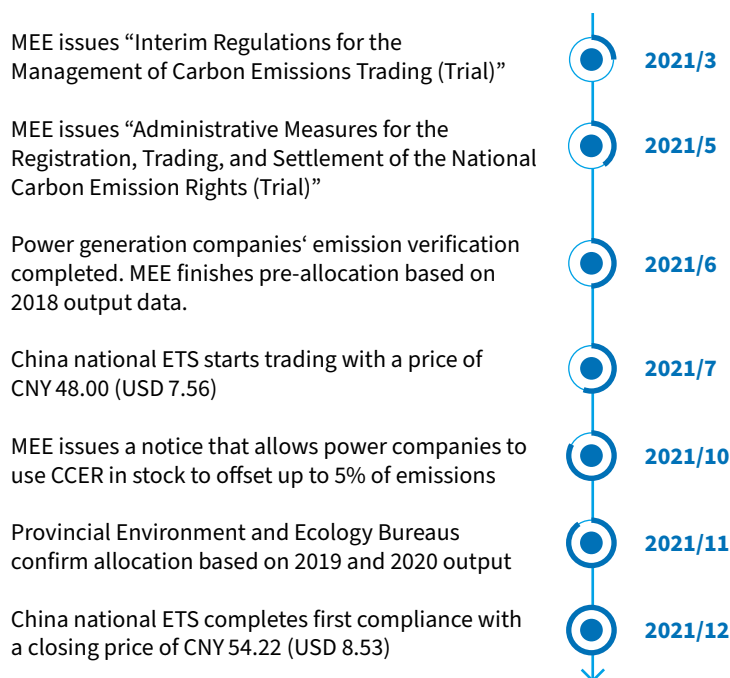


Figure 1. China national ETS timeline 2021

<sup>1</sup> The South China Morning Post "China's carbon neutral goals" - February 2022

<sup>2</sup> Allocation is divided into two stages – initial allocation followed by ex-post adjustment. First, 70% of allowances are pre-allocated to power companies based on historical output. Second, after completing verification, the allowance quantities are adjusted and confirmed according to the actual power and heat supplied by generating units.

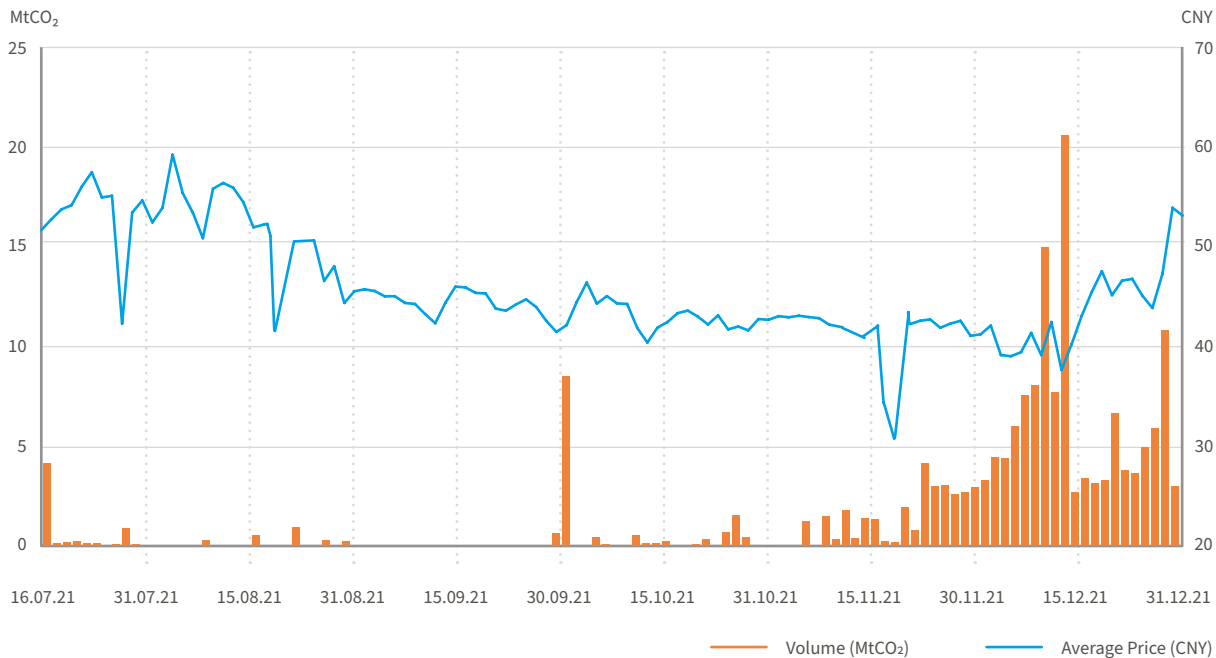


Figure 2. China national ETS average price and volume in 2021

### TRADING IN THE FIRST COMPLIANCE CYCLE: A DEEPER DIVE

A more in-depth look into the trading activities of the first compliance period shows several characteristics. The observations that we outline here indicate a functioning market that is still at an early stage and may need time to mature.

**There is an obvious “tidal effect” with transactions rising before compliance.** Three quarters of transactions occurred in the month prior to the compliance deadline. This could be mainly because many enterprises were not prepared for ongoing trading and hadn’t yet developed a routine transaction strategy. Another key factor to consider is that adjustments to allowance allocation were made throughout October and November, and only then could the allocation quantities received by covered entities be formally confirmed. This left less than two months for entities to prepare for compliance and complete transactions.

**Trading activity was lower than that of the Chinese regional ETS pilots.** The cumulative trading volume of allowances in the national ETS was 179 million tonnes. Compared with the total of 9 billion emission allowances issued for the two-year compliance cycle, the turnover rate<sup>3</sup> is only 2%, which is lower than the average turnover rate of China’s pilot ETSs (5%). This is also much lower than the turnover rate of the EU ETS spot market (more than 80% in 2020) and far below that of the EU ETS futures market (more than 500% in 2020).

**Transactions were mainly over-the-counter (OTC) block trades.** Of all transactions, OTC block trades (≥100,000 tonnes) accounted for 83% of the total traded volume. Prices for block trades were on average 8% lower than those of online trades across the whole trading period. It is thought that large corporates used OTC block trades to match intra-group companies to conduct transactions at lower costs. This way, they were able to take advantage of the block trade price limit (±30% of the closing price of the previous day), which allows more flexibility than the online transaction limit (±10%) and thereby reduces overall compliance costs.

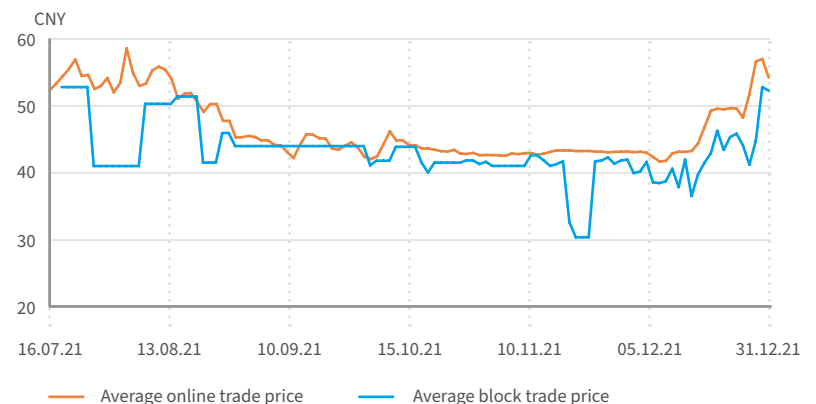


Figure 3. National ETS online vs. block trade price difference

<sup>3</sup> The turnover rate is the annual transaction volume divided by the total amount of allowances issued in the year.

## **ETS ENHANCEMENTS NEEDED TO ACHIEVE NATIONAL CLIMATE TARGETS**

The construction of the national ETS cannot be accomplished overnight. It is a multi-year mission that features different phases and continuous efforts of review and progress. “Learning by doing” will be an inevitable path for the construction and development of the national ETS. In the most recent step, China released three important policy documents in its “1+N” framework for carbon peaking and neutrality, confirming plans to strengthen the national ETS and expand it to more sectors. In the near future, we see five key aspects that need to be addressed to ensure that the national ETS fulfills its key role in achieving China’s dual climate targets.

### **(1) Strengthen the legal foundation**

It is likely that the State Council will promulgate new high-level legislation to replace the ministry-level decree currently in place. The new legislation will become a key milestone in the further development of China’s carbon market. In March 2021, the MEE took an important step by releasing a draft regulation for public consultation, which clarifies the intention to determine the emissions cap and allocation methods over the long run and proposes stricter penalties for non-compliance. Once finalized, the legislation is expected to provide a more robust legal foundation for the national ETS while strengthening some of its core design elements.

### **(2) Improve data quality**

Like in the early stages of other established systems around the world, such as with the EU ETS, data quality issues were uncovered in China’s national ETS in 2021, including several instances of data fraud. Therefore, the issue of data quality has been added to the government’s high-priority agenda for urgent action. According to the MEE, improving data quality control will be one of the key tasks in the second compliance period. To this end, the MEE will likely take action to strengthen qualification management, build capacity among the verification agencies and personnel, improve data submission and verification management requirements, and enhance law enforcement measures against data fraud.

### **(3) Expand coverage to include more sectors**

It is expected that during the “14th Five-Year Plan” period (2021–25), energy-intensive industries such as aluminum, cement, steel, petrochemicals, and paper-making will be gradually brought into the national ETS one sector at a time. The sequence of inclusion of these industries has not been officially announced yet, but market sentiment indicates that aluminum and cement are preparing to be the covered next.

### **(4) Refine the allocation approach**

Allocation under the Chinese national ETS is currently based on benchmarking with ex-post adjustment for production levels. The current settings have enabled a smooth start to the system, but they could be tightened in the coming period. The government has not yet announced its plan for allowance allocation for the second compliance period, and the pending decisions will have implications for the market. For the covered power companies and other market participants, it is crucial to know whether the current allocation methodology and benchmark levels will remain the same in the next period. China is also considering a long-term emission trajectory in the context of its national target to build a carbon-neutral economy by 2060. To achieve this target, experts are proposing that China’s national ETS should at some point move towards setting an absolute emission cap aligned with a long-term allowance allocation plan.

### **(5) Restart the CCER mechanism**

With the decision to allow accumulated historical CCERs onto the market in 2021, the offset mechanism became an important element in the national ETS. However, market participants understand that this is an interim decision. Looking ahead, they are anticipating a clear policy on the usage of offsets as the mechanism is expected to restart in 2022. Some key information is not yet clear, for example, what types of CCERs will be accepted in the compliance market in the future.

In 2021, China successfully set its national carbon market in motion. The analysis is promising, showing a smooth start to trading and compliance. Work is now needed to prepare China’s national ETS to take the next steps towards a larger, broader, and more robust carbon market, and take its place as one of the key policies to achieve China’s climate goals.

# The UK ETS

## One year on

It has been a year since we launched the United Kingdom Emissions Trading Scheme (UK ETS). We are proud of what we have achieved so far, and it is a good time to reflect on the progress we have made. We said from the start of the UK ETS that we saw the scheme playing an important role in delivering our emissions reduction commitments. The UK government's "Net Zero Strategy", published in October 2021, underlined this, placing fair carbon pricing as one of the key principles of the UK's approach to net zero. We have a wide-reaching plan to develop the scheme and make sure it lives up to these ambitions. But first it is worth reflecting on year one of the UK ETS.

### ESTABLISHING A NEW ETS

Setting up the scheme was not without challenges, but our experience with the European Emissions Trading System (EU ETS) was valuable, as we sought to balance continuity for participants with ambition. The sectors covered – industry, power, and aviation – are the same as in the EU ETS, but we reduced the cap by 5% compared to the UK's notional share of the EU ETS cap.

We started auctioning UK Allowances (UKAs) and trading began on the secondary market in May. We have been pleased to see the high level of interest in auctions and trading developing on the secondary market. In 2021, we issued around 127 million allowances through a combination of free allocation and auctions, with revenues from the latter reaching over GBP 4.5 billion (USD 6.2 billion) across the year. All but one of the auctions in 2021 fully cleared. Rules we put in place ensured one auction in October could still partially clear, with unsold allowances being successfully released to the market before the end of the year.

The end of the year provided another first when the cost containment mechanism (CCM) was triggered, after UKA prices on the secondary market exceeded the trigger price for three consecutive months. The CCM, like in other schemes, is a rules-based market stability tool which allows for – but does not require – intervention to mitigate sustained high prices if the price triggers set in legislation are met. In the early years of the scheme, we have deliberately put in place lower and shorter price triggers, giving us the opportunity to assess the functioning of the market sooner.

Ultimately, the decision on both occasions was not to intervene in the market. These decisions were aimed at upholding the objectives of the UK ETS as a market-based approach to reducing emissions and incentivizing participants to find the most cost-effective solutions to decarbonize. A well-functioning market is a priority for the UK and is an important factor in the success of emissions trading systems. We will continue to monitor the market closely and remain prepared to take timely and proportionate action, within the rules of the scheme, to support its effective functioning should the CCM be triggered again. We will also explore ways to increase liquidity.

**Charlie Lewis,**  
*Deputy Director for Emissions Trading, Department for Business, Energy and Industrial Strategy (BEIS)*

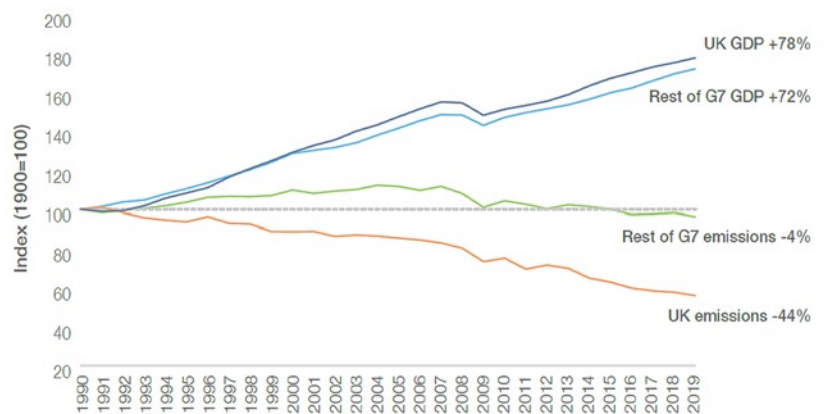


Figure 1 – UK vs Rest of G7 GDP and GHG Emissions

Source: UK Government "Net Zero Strategy: Build Back Greener" Page 41

### THE NET ZERO STRATEGY

The UK's progress so far and comprehensive plan to complete the journey to net zero by 2050 are the context for our plans to develop the UK ETS. We have achieved a lot on our road to net zero already. Since 1990, the UK has almost halved its GHG emissions. Between 1990 and 2019, we grew our economy by 78% and cut our emissions by 44%, decarbonizing faster than any other G7 country. However, we know we need to move faster.

The UK's Net Zero Strategy outlines measures to transition the whole economy to a green and sustainable future, helping businesses and consumers to move to clean power, supporting hundreds of thousands of well-paid jobs, and leveraging up to GBP 90 billion (USD 124 billion) of private investment by 2030. It builds on the Prime Minister's "Ten Point Plan" for a green industrial revolution published in 2020 and sets out

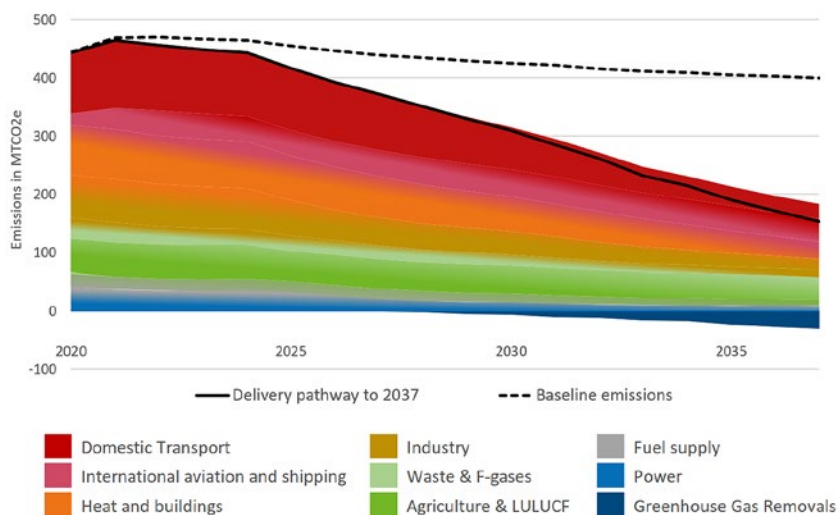


Figure 2 – Indicative delivery pathway to 2037 by sector  
 Source: UK Government “Net Zero Strategy: Build Back Greener” Page 18, BEIS Analysis 2021

decarbonization pathways to net zero by 2050, policies and proposals to reduce emissions for each sector and cross-cutting action to support the transition.

The Strategy sets a clear direction, supports investment, and provides opportunities for businesses in new markets at home and abroad. It gives businesses and industry the certainty they need to invest, grow, and make UK home to new ambitious projects. It shows how government is working with them to bring down the costs of key technologies – from electric vehicles to heat pumps – and to give the UK a competitive edge. And, as its prominence in the core principles of the Strategy shows, it recognizes the role of the UK ETS as a key lever on our path to net zero and sets out how we will approach the future growth of the scheme.

### WHAT’S NEXT

We want to continue to pursue greater climate ambition and develop the scheme to enable the UK to meet our net-zero targets.

The UK ETS Authority will consult in the coming months on a net zero consistent UK ETS cap, with the intention that any changes to the cap will be implemented by 2024 at the latest. This will set a clear trajectory and

send a strong signal on decarbonization for business to follow. We already initiated a Free Allocation Review by holding a call for evidence on free allocation in Spring 2021 and will continue the review by assessing how to appropriately mitigate the risk of carbon leakage while still preserving the incentive to decarbonize. We will do so alongside the review of the cap to ensure any changes are made in a rounded and consistent way.

The Net Zero Strategy reasserted our commitment to exploring expanding the UK ETS to other sectors. We will provide an update on our broader approach to this in due course, but the Strategy put forward some specific areas we are looking to focus on. Furthermore, as part of the upcoming consultation and in partnership with the Devolved Administrations, we intend to launch a call for evidence in the coming months exploring the role of the UK ETS as a potential long-term market for GHG removals.

As we develop the UK ETS, we will rely heavily on effective collaboration. This principle is intrinsic to how the system is set up, with the scheme jointly run by the UK Government and Devolved Administrations. It also applies to our external presence. We will consult with those affected by any changes including scheme participants, as well as with experts and international counterparts. We are proud of our achievements in the UK on carbon pricing and are excited to support and work with other jurisdictions looking to establish or develop their carbon pricing policy. Equally, we recognize that we have a lot to learn from the experience and innovations of others and we hugely value opportunities to work with other schemes on shared issues and challenges.

We can take confidence from polling that shows the UK public supports the “polluter pays” principle,<sup>1</sup> and the focus and positive outcomes on carbon markets achieved at COP 26. We also have a strong foundation to build on, a year on from the establishment of the scheme, and we look forward to seeing what the coming years have in store for emissions trading.

1 Demos and Zero-Carbon Campaign polling both show strong support for carbon pricing as part of the UK’s approach to net zero.



# The EU's plan to extend carbon pricing to maritime transport

**Hans Bergman,**  
European Commission  
DG CLIMA

Last year marked the publication of the most comprehensive set of climate proposals ever in the EU. In mid-July 2021, the European Commission proposed the “Fit for 55” package, a set of legislative texts aiming to deliver the EU’s 2030 climate objective – reducing net GHG emissions by at least 55 % compared to 1990 levels, a significant step up from the previous target of at least 40 %. This policy package elaborates the framework for the “European Green Deal”, a strategy adopted in December 2019 that aims to transform the EU into a modern, resource-efficient, and competitive economy, and to achieve climate neutrality by 2050.

A key aspect is to tackle emissions from transport. While the EU’s GHG emissions have decreased during recent years in areas such as industry and power generation – thanks notably to the EU’s carbon market – they have increased in the transport sector (see Figure 1). This is why the “Fit for 55” package contains several proposals specifically targeting the aviation, road, and maritime

transport sectors. The latter is especially relevant, as emissions from maritime transport (see Figure 2) are both substantial (3–4 % of the EU’s total emissions and 13.4 % of transport emissions) and are expected to increase further in the future, driven by the growth of this transport mode and its current heavy reliance on oil derivatives. Absent any additional measures, the International Maritime Organization (IMO) projects that by 2050 annual global maritime emissions could rise by 50 %, compared to 2018 levels (see Figure 3), which would represent more than a doubling of annual emissions since 2008.<sup>1</sup> Policy actions are urgently needed to reverse this curve.

To ensure that maritime transport contributes to the EU’s climate effort and to the Paris Agreement commitments, the Commission has proposed a range of measures to address GHG emissions from shipping in Europe, alongside continuing to push for global action at the IMO. In particular, the Commission proposes to

## kt CO<sub>2</sub> equivalent

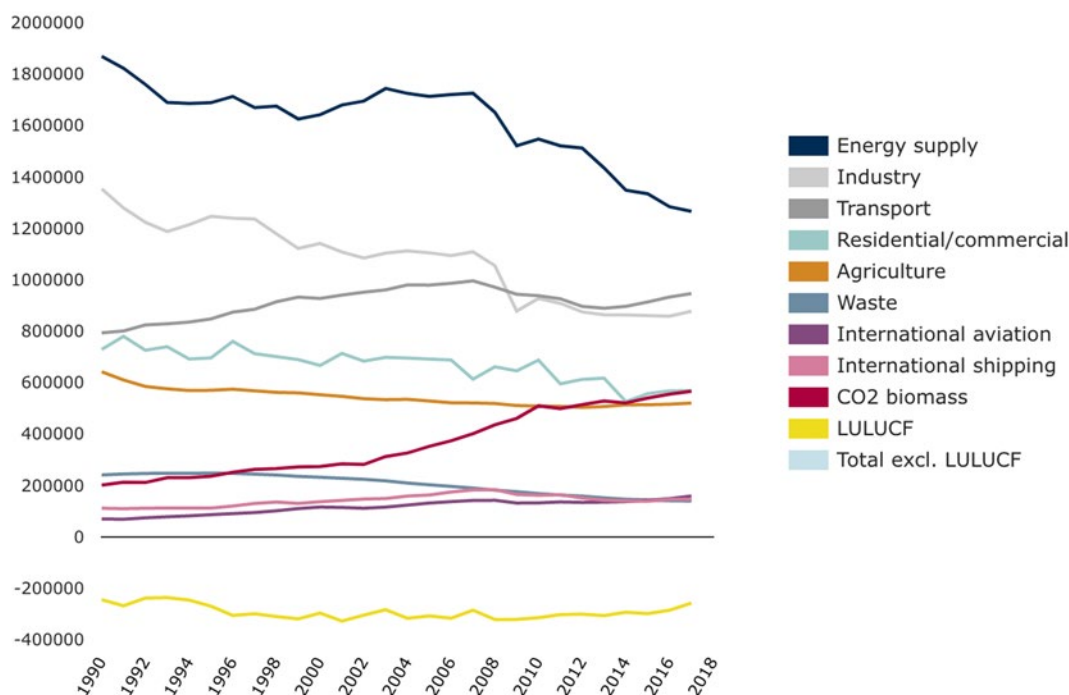
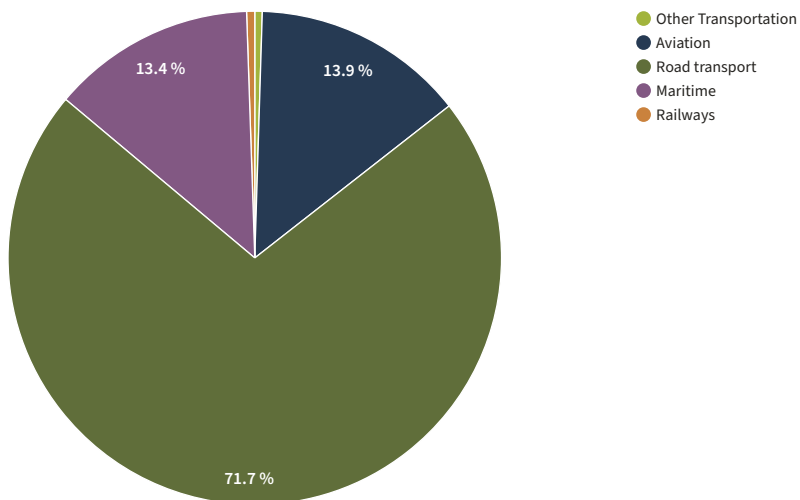


Figure 1 – Greenhouse gas emissions by aggregated sector

Source: European Environment Agency “Greenhouse gas emissions by aggregated sector” 2019

<sup>1</sup> European Environment Agency (EEA), European Maritime Transport Environmental Report 2021



**Figure 2 – EU (Convention) - Share of transport greenhouse gas emissions**  
 Source: European Environment Agency “Share of transport greenhouse gas emissions” 2019

extend the EU ETS to shipping,<sup>2</sup> building on the EU’s MRV system for CO<sub>2</sub> emissions from ships, which started in 2018.<sup>3</sup> This proposal is now under scrutiny by the Council of the EU and the European Parliament and will hopefully be adopted by the end of 2022.

The proposed extension of the EU ETS will have many benefits. First of all, the inclusion of maritime transport in the ETS will ensure it contributes to the EU’s climate objectives, since emissions will be part of the overall emissions cap, in line with the common level of ambition expected from the sum of all ETS sectors. Moreover, it will give shipping companies incentives to cut emissions where it is the most economical. By creating a price signal in line with the “polluter-pays” principle, it will make energy efficiency investments more financially attractive and will also reduce the cost differential between traditional and alternative fuels. Finally, full auctioning will raise revenues that can be used to support climate mitigation measures, fund research and innovation, and address social impacts.

Of course, extending the ETS does not come without challenges, and the proposal has been designed to mitigate these to the best extent possible. One challenge is to maximize the amount of GHG emissions covered while limiting administrative costs. The proposed ETS extension therefore only covers transport ships larger than 5,000 gross tonnage, which are responsible for about 90 % of CO<sub>2</sub> emissions from the sector. These ships have already been reporting and verifying their CO<sub>2</sub> emissions since 2018, in line with the MRV regulation referred to above.

Another challenge is to avoid the risk of competitive distortion. To ensure an equal treatment and level playing field, the system will be flag-neutral. In total, around 1,600 shipping companies representing about 12,000 ships – both EU and non-EU – will have to purchase and surrender ETS allowances for each tonne of reported emissions. The system will be “route-based” and will cover emissions from all voyages within and between EU countries<sup>4</sup> as well as 50 % of the emissions from voyages starting or ending outside of the EU, leaving third countries to decide how to appropriately address the emissions from the other half of the voyage.

Balancing the need for quick action and the necessity to let stakeholders get used to the new system also presents a challenge. For a smooth transition, a phase-in period is proposed from 2023 to 2025, where regulated entities would only be obliged to surrender allowances for a portion of their reported emissions, gradually rising to 100 % by 2026. Penalties and other enforcement measures – including port access denials – are foreseen to ensure compliance with the new rules. To ease administration, each shipping company will be associated with an administering authority of an EU Member State.

The ETS extension to maritime transport will certainly be a game-changer to reduce GHG emissions from shipping, but it cannot do the trick alone. To address the various technological, economic and regulatory

<sup>2</sup> Proposal for a Directive amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757 (COM/2021/551 final)  
<sup>3</sup> Regulation (EU) 2015/757  
<sup>4</sup> It will apply to European Economic Area (EEA) countries as well.

barriers that currently hinder the decarbonization of the sector, a range of different policy measures are proposed. Among these, the “FuelEU Maritime”<sup>5</sup> initiative is designed to boost demand for clean fuels by setting maximum limits – reduced every five years – on the GHG content of energy used by ships, and by encouraging zero-emissions technologies at berth. With regard to fuel distribution, the proposed “Regulation on Alternative Fuels Infrastructure (AFIR)”<sup>6</sup> will set, among other things, mandatory targets for shore-side electricity at main ports. On the supply side, the revision of the “Renewable Energy Directive (RED)”<sup>7</sup> should increase the current EU-level of 32% of renewable energy sources in the overall energy mix to at least 40% by 2030, with a special focus on the transport sector. This basket of measures should greatly help the uptake of renewable and low-carbon fuels and breakthrough technologies.

Finally, action at the international level is also crucial to fully embrace a green and global transition in maritime shipping. The Commission is fully committed to continue supporting ambitious progress under the framework of the IMO, especially as mid- and long-term measures – including market-based mechanisms – come under discussion.

From every angle and at all levels, in the maritime sector and all others, the EU is firmly committed to decarbonizing its economy with efficiency, ambition, and overall coherence. The year 2022 will certainly be decisive in that respect.

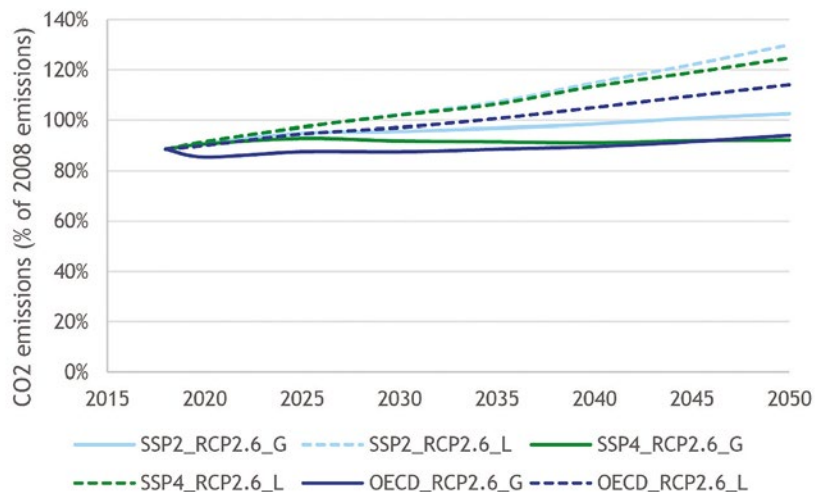


Figure 3 – Projections of maritime ship emissions as a percentage of 2008 emissions  
Source: Fourth IMO GHG Study 2020

5 Proposal for a Regulation on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC (COM/2021/562 final)

6 Proposal for a Regulation on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council (COM/2021/559 final)

7 Proposal for a Directive amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 (COM/2021/557 final)

# Carbon dioxide removals in reaching net zero

## The role of carbon markets

Luca Lo Re, Sara Budinis,  
and Tom Howes  
International Energy  
Agency (IEA)

### 2021 saw considerable momentum behind increased climate ambition, but there remains a large gap between announced targets and implemented actions.

In the last few years, many countries have put forward new or updated medium-term targets, including 140 NDCs, and long-term targets, such as the 59 net-zero emission targets and 47 long-term low-emissions development strategies (LT-LEDS). The ambition level of these goals was unimaginable even a few years ago. If met in full and on time, recent IEA analysis suggests these climate pledges could hold the rise in global temperature to 1.8°C by 2100.<sup>1</sup> Setting an ambitious goal is a necessary starting point but devising workable strategies and implementing effective policies is more important. Many countries are now turning to the task of translating their net-zero targets into near-term policies and plans, including by assessing the role of emission removals and the use of markets.<sup>2</sup>

### Emission removals will play a critical role in reaching global net-zero emissions.

All of the IEA scenarios that limit global warming to 1.5°C include the use of carbon dioxide removal (CDR) approaches.<sup>3</sup> CDR refers to capturing CO<sub>2</sub> from the atmosphere, and permanently storing it. The balance between emission reductions and removals, and the level of reliance on CDR, varies by scenario. Nevertheless, removals are not an alternative to deep mitigation, but a means of achieving net-zero emissions. A portfolio of CDR approaches will also likely be needed, which can encompass the following:

- a. **Technology-based CDR options** include direct air carbon capture and storage (DACCS), and bioenergy with carbon capture and storage (BECCS), which involves the capture and permanent storage of CO<sub>2</sub> from processes where biomass is converted to energy.
- b. **Nature-based solutions** depend on ecosystems to capture carbon, and typically include afforestation and reforestation (i.e., repurposing land-use by growing forests), and other forms of ecosystem restoration such as the enhancement of wetlands and soils.

- c. **Approaches involving enhanced natural processes** include enhanced weathering (artificially accelerating the natural process whereby acid rain dissolves minerals that then react with CO<sub>2</sub> to form carbonates), land-based approaches (such as biochar), and ocean-based approaches (such as ocean fertilization or alkalization).

Nature-based solutions are considerably less expensive today but more prone to the risk of non-permanence of stored emissions; their vulnerability to fires, pests, diseases, and forestry policy changes could lead to reversals of CO<sub>2</sub> stored. Furthermore, their dependence on land can create complex challenges at scale, with carbon storage potentially conflicting with food production, biodiversity, and local development objectives. Technology-based CDR options are currently costly but could bypass many of these challenges, potentially retaining CO<sub>2</sub> for centuries in appropriately selected and managed geological storage sites.<sup>4</sup> However, the enhanced weathering and ocean-based approaches here mentioned require further research to understand their potential for carbon removals as well as their costs, risks, and trade-offs.

### A rapid scale-up of technology-based CDR approaches is needed to reach global net-zero by 2050.

Although the IEA Net Zero by 2050 Roadmap<sup>5</sup> deploys a limited amount of technology-based CDR compared to IPCC 1.5 scenarios<sup>6</sup>, this entails a significant scale-up of BECCS and DACCS relative to today, reaching 1.9 GtCO<sub>2</sub> in 2050 (see Figures 1 and 2). Currently, around 2.5 MtCO<sub>2</sub> is captured annually from the 13 BECC plants (for CO<sub>2</sub> use and storage) and 19 DAC plants in operation globally. Achieving the level of deployment in the Net Zero Scenario will require further large-scale demonstrations to refine technologies, reduce capture costs, and better understand the scale and removal potential of these approaches.

Resources constraints and social acceptance, including of geological CO<sub>2</sub> storage, could limit the scale-up of technology-based CDR approaches<sup>7</sup>. Addressing

1 <https://www.iea.org/commentaries/cop26-climate-pledges-could-help-limit-global-warming-to-1-8-c-but-implementing-them-will-be-the-key>

2 [https://www.oecd-ilibrary.org/environment/understanding-countries-net-zero-emissions-targets\\_8d25a20c-en](https://www.oecd-ilibrary.org/environment/understanding-countries-net-zero-emissions-targets_8d25a20c-en)

3 Ibid, and <https://www.iea.org/reports/net-zero-by-2050>

4 Ibid

5 Ibid. Note: the IEA Global Energy Sector Roadmap to Net Zero by 2050 only covers the energy sector and only relies on technology-based carbon removals.

6 <https://www.iea.org/commentaries/a-closer-look-at-the-modelling-behind-our-global-roadmap-to-net-zero-emissions-by-2050>

7 <https://icapcarbonaction.com/en/net-zero-and-ets-paper>

high upfront investment costs (for BECCS) and energy needs (for DACCS) would require new business models and policy support to allow large scale deployment for certain regions, while any potential environmental impacts of CDR approaches would need to be carefully managed. Moreover, carbon accounting frameworks for CDR will need to consider potential CO<sub>2</sub> storage reversal. Relying on geological CO<sub>2</sub> storage provides high confidence in both the permanence of the storage and quantification of CO<sub>2</sub> removed.

**With new certification and methodologies, carbon markets could support the scale up of technology-based CDR approaches.**

Allowing the use of emission removal units in domestic and international carbon markets could generate financial flows and create demand for carbon removal services, spurring investment in CDR.<sup>8</sup> In domestic markets, experience with removals is so far limited to nature-based solutions, most typically forest-based offsets generated under strict methodologies.<sup>9</sup> This is the case in existing markets, such as China’s GHG voluntary emission reduction program<sup>10</sup>, California’s compliance offsets program<sup>11</sup>, and New Zealand’s unique coverage of the forestry sector under the country’s ETS<sup>12</sup>.

The inclusion of technology-based CDR approaches and removal units in domestic carbon markets is not trivial – it is both untested and faces considerable economic, legal and policy design challenges. These include how technology-based CDRs can be integrated into an ETS, how they relate to an ETS cap, to the allocation of free allowances, to a possible carbon border adjustment, and how to import or export CDR credits in linked ETS are all areas that require further research.<sup>13</sup> For instance, currently the EU ETS considers the combustion of biomass to be “carbon neutral”<sup>14</sup>; as such, there is no incentive or recognition for the emitted CO<sub>2</sub> to be stored through BECCS. Moreover, as a recent ICAP paper has shown<sup>15</sup>, in the context of net zero, ETS caps might fall to zero emissions or even become negative, which would entail an obligation for

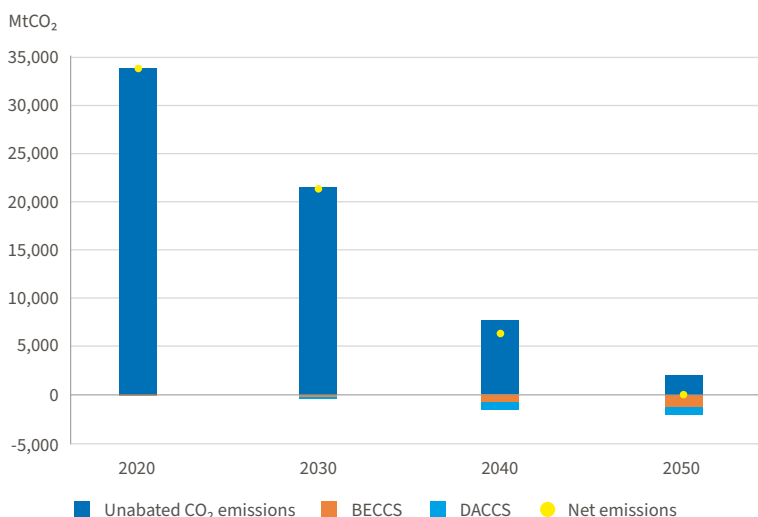


Figure 1: World energy-related CO<sub>2</sub> emissions and removal across the energy system in the IEA Net-Zero Emissions by 2050 Scenario, 2020–2050.

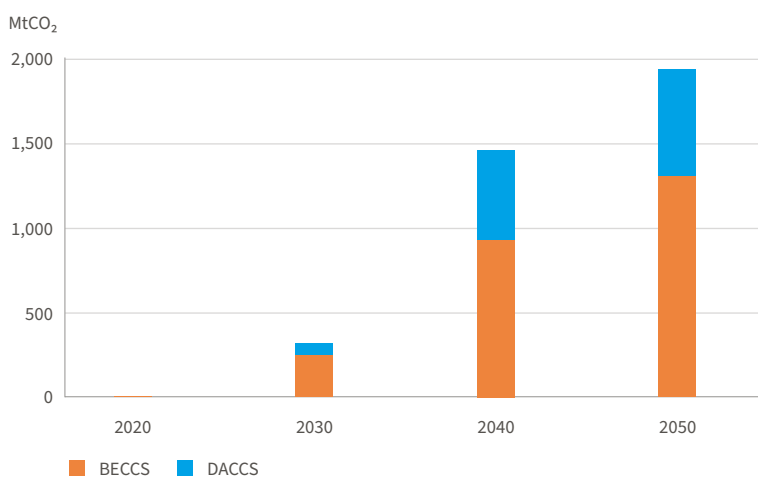


Figure 2: Technology-based removals across the energy system in the IEA Net-Zero Emissions by 2050 Scenario, 2020–2050

8 Ibid  
 9 <https://icapcarbonaction.com/en/net-zero-and-ets-paper>  
 10 <https://www.edf.org/climate/status-chinas-voluntary-carbon-market>  
 11 <https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program>  
 12 <https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/>  
 13 <https://www.frontiersin.org/articles/10.3389/fclim.2021.690023/full>  
 14 <https://www.emissions-euets.com/carbon-market-glossary/976-biomass>  
 15 <https://icapcarbonaction.com/en/net-zero-and-ets-paper>

covered entities to purchase and surrender removal units. The implications of this in terms of carbon leakage and competitiveness concerns would require further exploration.<sup>16</sup>

The experience in crediting technology-based CDR approaches in international carbon markets, including through Article 6 of the Paris Agreement, is still limited and new crediting methodologies are needed. For example, IPCC emissions reporting guidelines for national inventories cover BECCS but not yet DAC.<sup>17</sup> The crediting from DAC could benefit from simplified baseline methodologies since the MRV of removed emissions is more straightforward and transparent compared to the methodologies for projects using counterfactual baselines.

**Carbon markets could provide incentives, but additional policies are needed to scale up technology-based CDR approaches.**

While some recent developments, such as the EU proposal on carbon removal certification<sup>18</sup>, are a good first step towards possible voluntary markets for CDR credits, carbon markets alone are likely not sufficient to provide the incentives needed to bring CDR approaches at scale. Markets need to be complemented by other forms of policy support, especially if the long-term carbon price signal is unclear. This support could be framework policies and targeted support that aims to: (i) foster innovation; (ii) push early deployment; and (iii) co-operate internationally. Some recently launched initiatives aim at addressing these issues, including Mission Innovation’s “CDR Mission”<sup>19</sup>, the US “Carbon Negative Shot”<sup>20</sup> and support for DAC hubs in the US.<sup>21</sup>

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16 Ibid

17 <https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/>

18 <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-carbon-removal-certification>

19 <http://mission-innovation.net/wp-content/uploads/2021/11/Joint-Mission-Statement.pdf>

20 <https://www.energy.gov/articles/secretary-granholm-launches-carbon-negative-earthshots-remove-gigatons-carbon-pollution>

21 <https://www.iea.org/reports/direct-air-capture>

# The Carbon Pricing in the Americas Platform

## *Finding a path to mitigation across continents*

With 2021 ending on a high note for the Carbon Pricing in the Americas (CPA) platform, we, the co-chairs, are very excited to enter 2022 with a clear signal that interest in carbon pricing is alive and strong in the Americas. This signal is coming from a good mix of national and sub-national governments located in all regions of our continent; this diversity in our membership has indeed been recognized as one of our strengths. We are confident that the appeal of the CPA can encourage more governments to join our ranks in the future, and we hope to expand our network this year.

The mission of the CPA platform remains the same: to foster a dialogue and share information, experiences, expertise, and best practices among governments that have already put a price on carbon, are in the processing of implementing one, or are exploring the possibility of doing so. We encourage the convergence of carbon pricing policies that are both cost-effective and efficient, in terms of design and GHG emission reductions.

### **A NEW CPA DECLARATION IN 2021**

Since the unveiling of the first CPA Declaration in Paris in December 2017, the CPA platform has undertaken a range of tasks in pursuit of our mission. Our efforts are driven by our members and partners, so an important step was to understand their diverse views and interests on carbon pricing. To this end, we have organized webinars and polled our members and partners to better understand their needs and priorities with regards to the development and implementation of carbon pricing instruments.

Our members have expressed interest in a broad range of topics in the realm of carbon pricing, ranging from the choice of the best carbon pricing instrument to policy design and infrastructure, approaches to implementation and operation, revenue use and distributional impacts, MRV, benchmarking and linking of carbon pricing instruments, stakeholder consultation and acceptability, as well as competitiveness and carbon leakage issues.

It is our common view that more work needs to be done to promote and support carbon pricing and markets in the Americas, to stimulate the alignment of carbon pricing systems and maximize climate action, while ensuring real progress on reducing emissions. As the CPA platform offers a space where governments of the Americas can showcase what they are doing while receiving feedback from their peers, and where members and partners can build relations based on converging interests, we believe it can play a significant role in that endeavour.

In 2021, CPA members and partners agreed that it would be pertinent to update the 2017 Declaration to reflect the changes that the world was experiencing, from the overall rise in climate ambition to the COVID-19 pandemic and its trail of green recovery packages. We also recognized that a fresh declaration would present a good opportunity to reach out to potential new members in the Americas.

With this background, the CPA platform convened a side event at the IETA Business Hub during COP 26 to unveil the “Glasgow Declaration on Carbon Pricing in the Americas”. It was a great success, and we were very pleased to welcome the following new members: Dominican Republic, Jalisco, Panama, Paraguay, Querétaro, and Yucatán. We should mention that this list is in no way closed — we invite interested governments to endorse the Declaration and join our ranks as members of the platform.

The Glasgow Declaration asserts, among other things, our collective intentions to strive towards carbon neutrality by 2050 or before, to facilitate a just transition, and to emphasize the importance of voluntary international cooperation in carbon markets, including through Article 6 of the Paris Agreement. The endorsers also declare their commitment to pursue the implementation of carbon pricing as a central policy instrument for climate action, including in public investment decisions and as a key component of a green recovery from the COVID-19 pandemic, and to regularly raise the carbon price to better reflect the social cost of carbon. They further commit to continuing their regional cooperation efforts under the CPA with a view to aligning carbon instruments.

**By the Co-chairs:**  
**Juan Pedro Searle,**  
*Chile*  
**Jean-Yves Benoit,**  
*Québec*

## LOOKING AHEAD AT 2022 AND BEYOND

As co-chairs of the CPA, we also believe it would be useful to examine potential synergies and opportunities for coordination with other carbon pricing initiatives and forums that are active in the Americas. There is great potential to harness the pool of knowledge and capacities already available, encourage further networking, enable information sharing, and avoid duplication. Gathering these forces could enhance efficiency to fight climate change in the Americas and we are committed to exploring that avenue along with our members and partners.



*Juan Pedro Searle*

We are hopeful that there is enough commitment in the Americas to rise to the challenge of fighting climate change – and that there is enough vision in this part of the world to use the right tools to do so successfully. Carbon pricing instruments are among the tools that have proven to be efficient in reducing GHG emissions. It is important that ever more governments learn about them, choose the right one for their circumstances, and stay on the lookout for the chance to align these policies across the Americas so that, together, we may all adopt a successful comprehensive approach to fighting climate change.



*Jean-Yves Benoit*

The Carbon Pricing in the Americas platform was born after the launch of the “Paris Declaration on Carbon Pricing in the Americas” in 2017. By endorsing the Glasgow Declaration four years later, member governments of the CPA platform reaffirmed their support of the Paris Agreement and advocated for the scaling up of the climate action in the Americas, notably by highlighting the importance of carbon pricing mechanisms as effective instruments to reduce GHG emissions and committed to work towards the alignment of carbon pricing policies in the region. The endorsers also acknowledge that the alignment of these policies across the Americas can provide a variety of co-benefits, including more efficient emission reductions, improved market liquidity, and reduced competitiveness concerns.

The current endorsers of the Glasgow Declaration on Carbon Pricing in the Americas and members of the CPA platform are: British Columbia, California Air Resources Board on behalf of the State of California, Canada, Chile, Dominican Republic, Jalisco, Nova Scotia, Panama, Paraguay, Québec, Sonora, and Yucatan.

The CPA platform can also count on the support of the following partner organizations: Carbon Trust, Center for Clean Air Policy, Conservation International, ECLAC, EDF, ICAP, IETA, UNEP, the World Bank, and the UNFCCC secretariat.



# Charting the course to carbon neutrality for all Californians

In recent years, smoke from the most destructive wildfires on record has cloaked California. Families in the fire zones have hastily evacuated and schools faced closures as teachers and children struggled to breathe in and outside of their classrooms. Downwind of these wildfires and in search of clean air, some have headed to safer areas, aware that others lacked the resources to do the same. California's horrifying fire season in 2017, with 47 deaths and 1.5 million acres burned across the state,<sup>1</sup> is now a moderate year compared to the devastating wildfires, extreme drought, and flooding that are the new normal. Climate change-fueled natural disasters are exacerbating existing disparities in our communities, where families without the means to adapt bear even greater health and economic burdens.

It is in this context, with climate disasters disproportionately impacting communities heavily burdened by pollution from multiple sources and most vulnerable to its effects, that California has set a goal for statewide carbon neutrality by 2045 — a goal in line with what science says is needed to limit global warming to 1.5 °C. Meeting this goal requires transformational change. It entails driving down emissions from all sources in our GHG inventory, drastically reducing or eliminating fossil fuels burned, and converting our natural and working lands from a source of emissions to a sink. In guiding this change, California continues to focus on designing its portfolio of climate change programs to advance equity and environmental justice.

California met its 2020 GHG reduction target<sup>2</sup> four years early. Now, through its Scoping Plan Update process, the California Air Resources Board (CARB) is assessing progress on achieving the faster and deeper reductions needed to meet our 2030 target<sup>3</sup> as we lay out the path to carbon neutrality in 2045. The update occurs every five years,<sup>4</sup> and this current 2022 Scoping Plan Update<sup>5</sup> is focused on identifying both the endpoints for our transition to carbon neutrality and the near-term actions necessary to bring air quality benefits to the most burdened communities, while also providing long-term GHG reductions.

Central among California's suite of climate policies is the Cap-and-Trade Program. To date, by design, California's ETS has tackled the least-cost emissions reductions first. By doing so, we are establishing clear long-term investment signals, allowing time to incorporate technological advances, and reinvesting billions of dollars in auction proceeds to further GHG reductions throughout the state, with a focus on supporting disadvantaged communities. This approach has laid the groundwork for the more difficult reductions ahead. In line with this challenge, CARB has already doubled the stringency of the cap from the 2013–2020 period into this new decade, increasing the rate of cap decline from 2% to approximately 4% per year.

**Rachel Gold,**  
California Air Resource  
Board

***Critical to California's approach are design features in the ETS and complementary measures that provide support for heavily burdened communities.***

Critical to California's approach are design features in the ETS and complementary measures that provide support for heavily burdened communities. A central strategy is reinvesting state-owned ETS auction proceeds to benefit these communities while simultaneously reducing GHGs. The California Legislature determines the appropriation of state-owned auction proceeds pursuant to statutory requirements that investments achieve emissions reductions and be directed towards the most disadvantaged communities, alongside certain continuous appropriations, and annual budget priorities.<sup>6</sup>

Thus far, California's ETS auctions have generated over USD 18 billion,<sup>7</sup> the majority of which is being directed to individuals and communities most in need of assistance. This emphasis on investing in burdened communities is essential as we strive to ensure our climate



1 [Cal Fire 2017 Incident Archive](#)

2 Return to California's 1990 level of GHG emissions.

3 For a 40% reduction in emissions compared with 1990 levels by 2030.

4 As per Assembly Bill 32.

5 See [AB 32 Climate Change Scoping Plan | California Air Resources Board](#) for more information.

6 See [About California Climate Investments](#) for more information.

7 [Summary of Auction Proceeds to California and Consigning Entities](#)



## Cumulative Project Outcomes



51% of funding benefiting priority populations (\$4.5 billion)



659,000+ acres of land preservation or restoration



542,000+ individual projects implemented



740+ transit agency projects funded, adding or expanding transit service



8,000+ affordable housing units under contract



123,000+ projects installing energy efficiency measures in homes



125,000+ urban trees



399,000+ rebates issued for zero-emission and plug-in hybrid vehicles

May 31, 2021

policies support a just transition. These funds are being used to help individuals and local governments purchase zero-emission vehicles, increase access to affordable and energy-efficient housing, assist farmers with purchasing cleaner equipment, and increase alternative mobility options, among other actions.<sup>8</sup>

Another example of reinvesting auction proceeds is the Transformative Climate Communities program, which empowers communities with high levels of poverty and pollution to set their own goals and develop strategies to address air pollution and reduce GHGs in their neighborhoods. So far, this program has resulted in the development of sustainable affordable housing, local renewable energy, increased transit services, urban greening, bicycle sharing programs, and other local initiatives.<sup>9</sup>

California has also implemented a unique approach to protecting consumers from the energy cost increases associated with its ETS. Allowances are freely allocated to electric and natural gas utilities, which then must sell a portion of the allowances at auctions and return the proceeds to consumers through flat, lump-sum credits on electricity and natural gas bills. While the increased

energy costs incentivize conservation and efficiency, the flat credits provide relief from the cost increases. This approach is also an important mechanism to ensure the protection of lower-income consumers from cost increases. The flat credits are paired with public messaging encouraging residents to reduce energy usage and are complemented by California's robust energy efficiency programs. Through 2020, California residents have received nearly USD 6 billion in credits since the beginning of the program, easing their financial burden associated with achieving our climate goals.<sup>10</sup>

California's ETS works in concert with a range of complementary measures that protect communities from exposure to air pollution and support the transition to carbon neutrality, including the direct regulation of stationary sources by local air districts<sup>11</sup>, emissions standards for vehicles, incentives for electric vehicles, and the Community Air Protection Program. Established in 2017, the Community Air Protection Program develops community-focused actions to reduce air pollution and improve public health in the most impacted communities.<sup>12</sup> Through this program, CARB partners with local communities to identify pollutant

<sup>8</sup> See [California Climate Investments](#)

<sup>9</sup> More information is available at: [California Strategic Growth Council, Transformative Climate Communities](#).

<sup>10</sup> See summaries for [Electrical Distribution Utility and Natural Gas Supplier Use of Allocated Allowance Value](#) at:

<sup>11</sup> Local air districts are government bodies responsible for regional air quality planning, monitoring, and stationary source and facility permitting. California has 35 local air districts.

<sup>12</sup> [Community Air Protection Program](#)

sources of concern and develop strategies to reduce exposure or address the underlying causes of pollution. Each year, this program expands to additional communities throughout the state, applying lessons learned from its community-centered approach.

As we assess California's suite of climate programs through the 2022 Scoping Plan Update, it is of central importance to ensure that these programs continue to protect public health and support opportunities in heavily burdened communities. Our priority is to minimize fossil fuel combustion, which is the primary driver of both climate change and public health problems related to poor air quality. For many applications, alternatives to fossil fuel combustion already exist, and the Scoping Plan Update process is the platform for all Californians to publicly discuss where, when, and how the change to alternatives should happen.

To develop policies that are effective, inclusive, and equitable, it is vital we engage with a diverse set of stakeholders. While California has a robust and extensive public consultation process, we recognized the need to do more to engage with communities that face high barriers to engagement in these processes. Fully incorporating inclusivity and equity into climate change policy design has required us to develop new levels of engagement and coordination with communities, local government, academics, industry, and other agencies. CARB recently expanded its leadership focus on these issues with an executive-level officer for environmental justice, who is dedicated to incorporating environmental justice into policies and building meaningful relationships with community organizations and leaders.

Climate change has already changed California, from the basic need to evacuate due to wildfires to the extreme droughts that are leaving some communities without water. These changes contribute to the urgency of our collective work to tackle the more difficult GHG reductions ahead and support climate adaptation in a manner that is equitable, effective, and supports resilience in our communities.

***To develop policies that are effective, inclusive, and equitable, it is vital we engage with a diverse set of stakeholders.***



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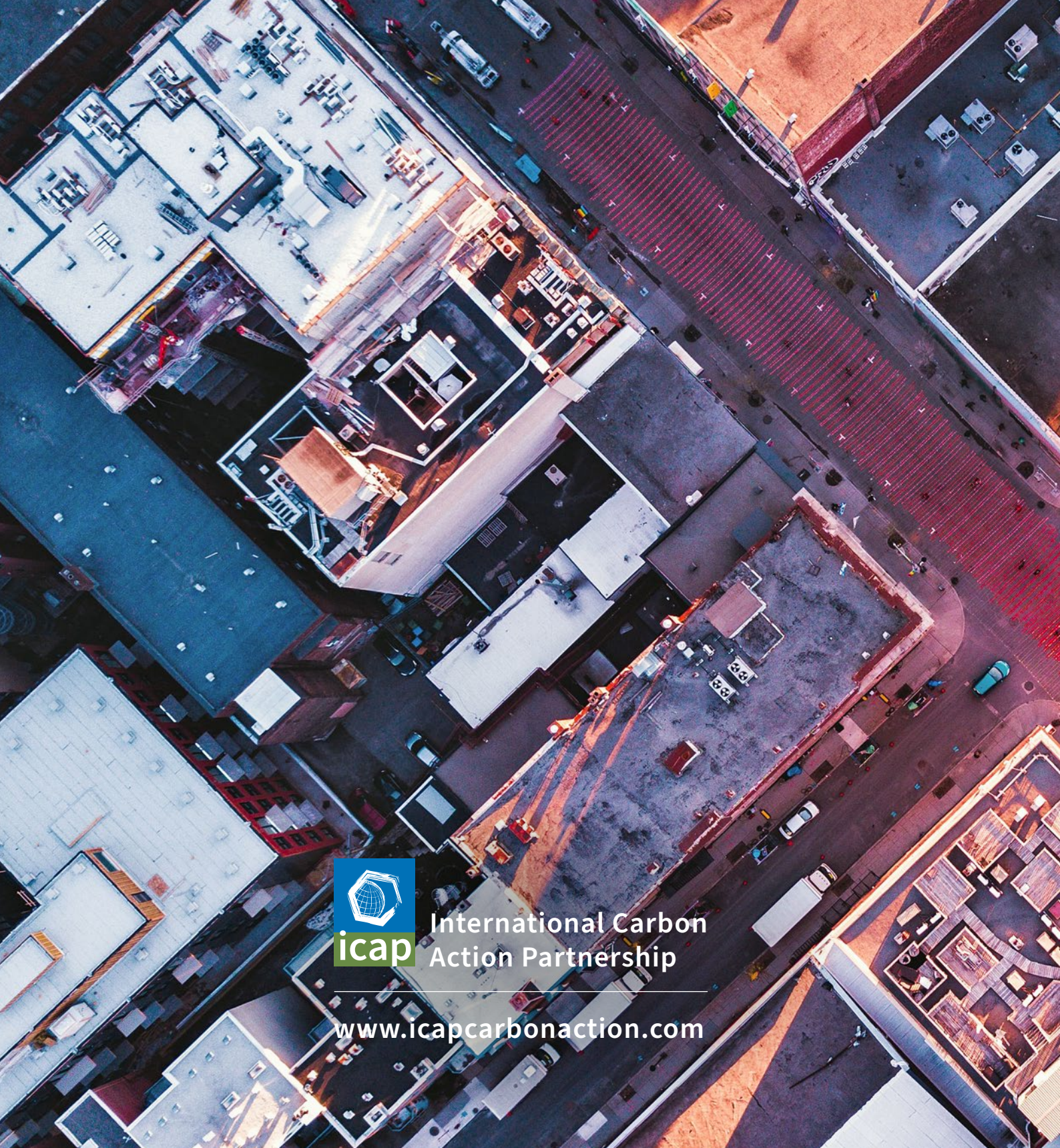
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