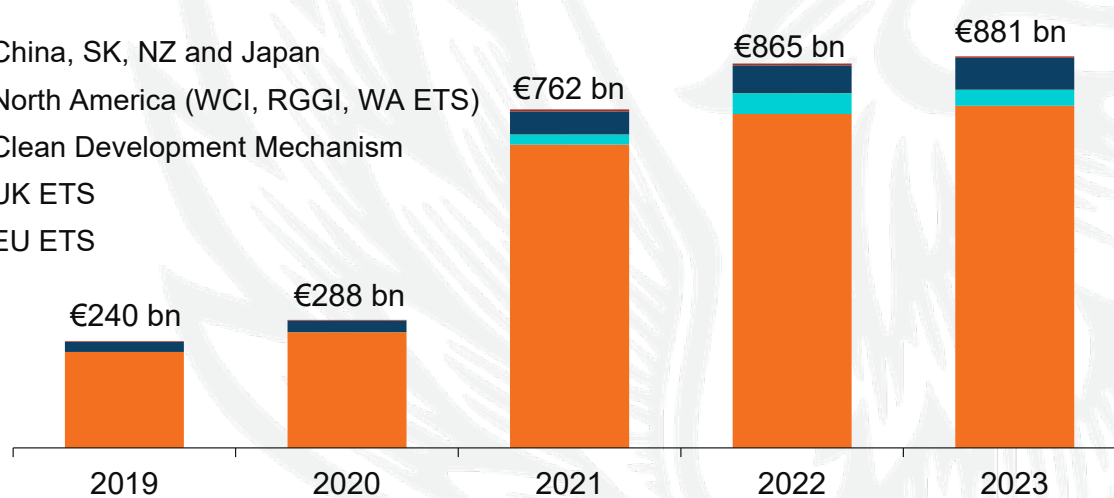


CARBON MARKET YEAR IN REVIEW 2023: GROWTH AMID CONTROVERSY

World Carbon Markets - Total value by segment

- China, SK, NZ and Japan
- North America (WCI, RGGI, WA ETS)
- Clean Development Mechanism
- UK ETS
- EU ETS



YIR 2023 in brief:

- Prices fell across most carbon markets in 2023 after a banner year in 2022 amid sluggish global growth, political challenges, and receding volatility in the global gas market. The two notable exceptions to this trend were in China and the US, where prices increased. In China, the second compliance deadline saw a surge in buying interest in the second half of the year, prompting prices in both the listed and OTC markets to hit record highs. Elsewhere, carbon prices fell – often heavily – amid continued oversupply and demand destruction.
- The United States' latest carbon market, the Washington Cap-and-Invest Program, started the year with a bang, posting ever-higher prices over its first three auctions, before the government stepped in with a change in policy, prompting prices to fall back throughout the fourth quarter. Meanwhile, the California-Quebec WCI market saw prices steadily increase throughout the year to hit new record highs as the California Air Resources Board explored scenarios to tighten the allowance cap in the coming years. RGGI prices also increased to new highs, despite on-going uncertainty about the participation of either Virginia or Pennsylvania in the program.
- The European Union pursued an ambitious environmental policy agenda throughout 2023, including substantial reform of the EU ETS. This boost in activity and tighter allowance plan saw prices briefly peak above the €100/t level in February, and they remained elevated throughout Q3 before a weak winter gas market and economic headwinds prompted them to drop sharply throughout Q4. The EU is facing European Parliamentary elections in 2024, which could frustrate further climate legislation in the short-to-medium term.
- Carbon markets continued to expand into new jurisdictions in 2023, with Egypt, Japan, Indonesia and Taiwan all launching new schemes. Indonesia's carbon market is a voluntary carbon market where participation is heavily encouraged, covering the power sector that uses carbon credits, while Japan and Taiwan are both voluntary markets. India, Brazil and Turkey have all taken steps in 2023 to launch their own domestic schemes, which are due to begin trading within the next one to three years; most of these are set to be credit-based and voluntary to start, before transitioning to compliance-based schemes towards the end of the decade.
- The Voluntary Carbon markets had a rough year amid concerns about credit quality, prompting prices to tumble to below \$1/tCO₂e on many standardized instrument contracts; the spot market was somewhat more resilient given that buyers adopted a project-by-project approach to purchasing decisions. Nowhere was this impact felt more than among REDD+ projects, which faced substantial media scrutiny throughout the year; long-running Zimbabwe forestry project Kariba was eventually dropped by certifier Verra and project developer South Pole. Industry initiatives like the IC VCM and VCMI have released new guidance to address integrity concerns about carbon credits that have so far been well-received by the industry.
- Carbon markets were punted to 2024 at the COP 28 conference in Dubai after Parties failed to reach an agreement on rules underpinning trading for both Article 6.2 covering bilateral ITMO agreements and Article 6.4 covering credit trading between countries. This means that there are unlikely to be new UN-approved credits in the market ahead of 2025 at the earliest, a full 10 years on from the Paris Climate Agreement. The delay is also likely to put more pressure on Voluntary Markets where buyers, sellers and Standards alike are already in the process of setting up Article 6-compliant credits using Corresponding Adjustments.



LSEG

ABOUT THIS REPORT

This report presents LSEG's assessment of the world's major carbon markets in 2023. The aim is to show the main market trends and policy developments in global emission trading systems, and areas where such systems are emerging. We collect data from official sources, primarily carbon trading platforms such as ICE, Nodal, EEX, CME, CBL, KRX, JPX and the Chinese carbon exchanges. When relevant, we estimate and add the size of bilateral (over-the-counter) transactions. This gives us an estimate of the actual volume traded.

Our analysis covers the main regions in which there are existing or emerging emission markets. Chief among these is Europe with its EU ETS and also, since 2021, the UK ETS. We do not include data from the Swiss ETS. In North America, we look at the WCI, RGGI and newly launched Washington Cap-and-Invest markets. In China, we include the National ETS, the Pilot ETS systems, and offset trading in the CCER market. We also include analysis of the South Korean carbon market (KETS), New Zealand market (NZ ETS), and the voluntary Japan ETS which launched in October 2023. As of 2024, we have also included smaller sections on emerging global carbon markets in Brazil, Indonesia, India, Egypt and Turkey.

Finally, the report also comments on developments in international aviation emissions and related offset trading, trading in the voluntary carbon markets, and updates on international carbon negotiations, particularly in relation to Article 6 of the Paris Climate Agreement.

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1. Executive summary

Carbon markets continued to expand in 2023, although prices fell across most markets, particularly as the year drew to a close. The **European Union Emissions Trading System (EU ETS)** remained the largest global market by far, accounting for around 87% of the value of the global carbon market in 2023. A rally in prices early in the year – briefly peaking above the €100/t mark in February – followed by a sustained hold over €80/t meant that market value in the EU ETS actually ticked up slightly by about 2%, despite a 2% decline in overall turnover. However, EUAs finished the year on a decidedly bearish note, dropping sharply throughout Q4 amid weak winter gas prices and a less-than-compelling economic outlook.

The European Commission has continued to pursue an ambitious climate and environmental policy through its Fit for 55 program, which it largely managed to pass in 2023, including substantial ETS Reform (for more details, please see the EU section below). The long-term outlook for EUAs remains broadly bullish but is likely to stay flat-to-bearish in 2024 given current economic conditions, a weak gas market, and an extremely generous auction calendar due to the front-loading of allowances under the REpowerEU program.

Trading actually increased by nearly 20% in the **UK Emissions Trading System**

(**UK ETS**) throughout 2023, even as prices tumbled sharply; it accounts for about 4% of the total value of the global carbon market. Since it was split out of the EU ETS in 2021 as a consequence of Brexit, the UK ETS has struggled somewhat with liquidity, and many market participants have continued to hedge forward carbon exposure in the much more liquid EUA market. UK environmental policy diverged from the EU sharply in 2023, with Rishi Sunak's government walking back a number of green pledges and pursuing a much less ambitious ETS reform agenda, all of which had a decidedly bearish impact on UKA prices, particularly over the second half of the year.

UKAs had spent much of 2022 at a premium to EUAs, but the shift in dynamics prompted them to tumble relative to their EU-counterparts to sharp discounts of more than €25/t at the end of Q4. This is particularly noteworthy for UK industries, which could be exposed to the EU's new Carbon Border Adjustment Mechanism if carbon prices remain at steep discounts in the UK relative to the EU. While further reforms to the UK ETS are likely in the coming years – the country is also facing a General Election – current outlook is very bearish, with the oversupply of allowances set to persist well into the next decade; without further reform, the discount to EUAs is expected to widen out to 2030.

North American trading activity dropped slightly in 2023 despite the addition of a brand new market in the form of the **Washington Cap-and-Invest** program in February. However, prices across the North American Carbon markets actually rose overall throughout the year, accounting for approximately 8% of the value in the global carbon market.

Prices for CCAs in the **California-Quebec market** hit new highs, with each auction posting progressively higher settlements throughout the year; the California Air Resources Board (CARB) has been actively exploring scenarios to tighten the overall cap in the WCI market, which had a decidedly bullish impact on prices. Prices in the **Regional Greenhouse Gas Initiative (RGGI)** market also rose over the course of the year to new highs, despite a fair amount of uncertainty about the future makeup of the program, with participation of Virginia and Pennsylvania – two large states – still up in the air. While it is likely that Pennsylvania will withdraw after the State's Supreme Court ruled against its participation, Virginia's status is much murkier, and both battles are expected to be drawn out into 2024, an election year in the US. Washington's new market proved much more volatile, posting the highest-ever carbon prices in North America over its first three auctions, before

Table 1.1 Global carbon market size 2021-2023

LSEG assessment of volume and value of the major carbon markets from 2021 to 2023. Millions of tonnes (Mt), millions of euros *

	2021		2022		2023		Volume change 2022-2023	Value change 2022-2023	Share of total value 2023
	Mt	€ million	Mt	€ million	Mt	€ million			
Europe (EUAs, aviation EUAs)	12,214	682,501	9,277	751,459	9,105	769,903	-2%	2%	87%
UK ETS	335	22,847	512	46,626	607	36,353	19%	-22%	4%
North America (WCI, RGGI, WA ETS)	2,680	51,736	2,488	62,441	2,428	71,359	-2%	14%	8%
China	412	1,289	112	755	294	2,264	163%	200%	<1%
South Korea	51	798	39	618	89	639	128%	3%	<1%
New Zealand	81	2,505	60	2,845	17	596	-72%	-79%	<1%
CERs	38	151	42	157	22	35	-48%	-78%	<1%
Japan	0.7	10.4	0.6	12.3	0.5	8.7	-20%	-29%	<1%
Total	15,812	761,838	12,531	864,913	12,563	881,158	0%	2%	

All non-European transactions are priced in local currencies, for the sake of consistency we have converted values into euros. The units traded in the Regional Greenhouse Gas Initiative are short tons, which are 0.907 metric tonnes. For unit consistency, we have converted RGGI's total volume figures to metric tonnes.

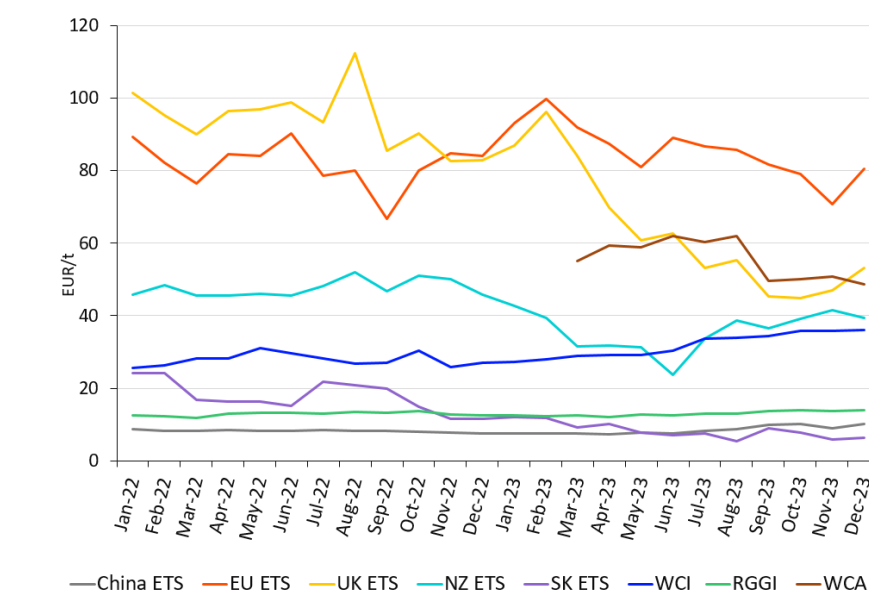
Source: LSEG, February 2024

a sudden change in policy prompted prices to tumble in the fourth quarter. Officials are already exploring the possibility of linking the new Washington market with the much larger California-Quebec market.

Trading in **China's National and pilot ETS** markets rose, particularly in the national market ahead of the second compliance deadline at the end of the year, with total trading volume in China up 163% and market value up 200%. CEAs hit fresh all-time highs in Q3, and while they dipped slightly towards the tail end of the year, they have gone into 2024 – a non-compliance deadline year – at much higher levels. Authorities in China have been moving to strengthen the ETS ahead of likely expansion to new sectors in the near term; currently the National ETS only covers the power sector, although other sectors are captured in various Pilot ETS programs. The Shanghai Environment & Energy Exchange (SEEE) split CEAs into compliance year categories in 2023, which raised market speculation that future compliance obligations will not be able to be met with older vintage CEAs, potentially as a way to manage allowance surpluses as the market expands, although no such policy has been announced. China has also been in the process of relaunching its China Certified Emission Reduction (CCER) credit program, with new credits expected to be released in 2024. CCERs can be used to meet a limited percentage of compliance under the National ETS, but the program has been suspended for the last seven years as authorities looked to restructure it and tighten some of the methodologies. Old CCER credits will no longer be available for use against compliance obligations after 2025, the announcement of which prompted a surge in trading of credits as the year drew to a close. The Pilot markets remained largely unchanged in 2023 in terms of coverage and size, although prices fell across the majority of them. China's carbon markets remain small in global terms, but its share is expected to continue to increase, particularly ahead of the third compliance deadline at the end of 2025.

Carbon markets expanded across the **Asia Pacific region** in 2023, although they remain very small in terms of overall global value. Prices fell in both of the established APAC markets, the **South Korea Emissions Trading System (K ETS)** and the **New Zealand Emissions Trading System (NZ ETS)**, although Korea's total market value actually rose by 3% amid a 128% trading increase as liquidity in Korean Allowance Units (KAUs) rose sharply. There

Figure 1.1 Emission allowance (permit) prices in key markets 2023 (by month), (Local prices converted to euros)



Source: LSEG

is still a significant surplus of allowances in the KETS, and while the South Korean government has been discussing adopting stricter environmental and emissions targets, that has not translated into significant ETS reform so far. The NZ ETS had a much more volatile 2023 amid a protracted debate about the state of its forestry methodologies – which have been accused of favouring exotic plantations over native species – as well as concern about oversupply and possible reform. All four of the country's auctions failed. Additionally, national elections unseated the long-running Labour government, ushering in a Center-Right Coalition led by the National Party, who indicated that they would pursue no further ETS reform. Trading dropped 72% from 2022, and overall market value fell 79%, while prices ended the year largely where they started it. Elsewhere in APAC, **Japan's voluntary ETS** launched in October on the Tokyo Stock Exchange; liquidity has so far been muted but is expected to pick up in 2024 as the market finds its feet. **Indonesia** also launched its own domestic carbon market, which uses credits rather than allowances to meet offsetting obligations, although trading has yet to fully take off. **Taiwan** also launched its own voluntary carbon market in December, and **India** has started preparations to begin its own voluntary carbon market with plans to transition it into a compliance market at some point down the line.

International carbon markets had a challenging 2023, with the negotiations at COP 28 in Dubai unable to come to a conclusion on the trading terms for Article 6,

which governs international carbon trading between Parties. Both Article 6.2 and Article 6.4 remained undecided as the conference drew to a close, likely delaying further action for a year or more. While bilateral carbon trading between countries will probably continue much the way it has now, the lack of a formal agreement governing the process under the UN will likely slow the development of new partnerships. Meanwhile, the lack of a decision on Article 6 will put additional pressure on the **Voluntary Carbon Market (VCM)**, which spent much of 2023 struggling under a cloud of poor press coverage and concerns about project integrity. Prices across the VCM standardized contracts dropped heavily throughout 2023, with most dropping to below \$1/t, although over-the-counter transactions proved marginally more resilient as buyers adopted a project-by-project approach to purchases. There have been a number of initiatives introduced in the VCM to manage integrity concerns, both through voluntary best practice standards, as well as through alignment with Article 6 principles under the Paris Agreement; initial market reaction to these has been cautiously optimistic, but the supply of these credits is not yet large enough to fully gauge the impact, which will make 2024 an important year for the market.

2. EU ETS

An ambitious year for climate policy in Brussels had profound impacts on the European Emissions Trading System (EU ETS) in 2023, with European Emissions Allowances (EUAs) breaching the psychologically-significant €100/t mark in February. The European Commission passed significant climate legislation in 2023, fundamentally reforming the EU ETS to tighten allowance balances, although the bullish impact of this was tempered by the decision to front-load allowances to finance REPowerEU, the Bloc's ambitious renewable energy acceleration program. However, a weaker gas market, the threat of a global banking crisis, and industrial demand destruction amid sluggish economic growth ultimately proved to be bearish for EUAs, particularly over the fourth quarter of 2023. The rise of right-wing and nationalist parties throughout the year could have a knock-on impact on the makeup of the EU Parliament following elections in 2024, which could impact further climate policy, as well as the price of EUAs, although the Commission has announced that they are planning to push for a 90% reduction target by 2040.

MARKET DEVELOPMENTS: TURNOVER INCREASES SLIGHTLY AMID HIGHER ALLOWANCE PRICES

The turnover of the EU ETS increased 2% from €751 billion in 2022 to €770 billion in 2023, mainly due to nearly unchanged

traded volume and higher allowance prices for the year. A total of 9.1 billion emission allowances (EUAs) changed hands, down 2% from 2021. The lion's share of transactions came from front-year futures (December 2023 delivery), but contracts further out on the curve (2024 and beyond) also traded frequently, and quite a bit of volume traded during the weekly sales on the three EUA auction venues (EU common, German, and Polish platforms). Our assessment of EU ETS volume also includes the auctioned volumes of aviation EUAs.

The slight decline in trading was common to all transaction types, apart from a year-on-year rise in auction volumes. Daily volumes for the front-December EUA contract – Europe's "benchmark contract" – on ICE averaged 21.4 million tonnes (Mt) in 2023, up slightly from 21.1 Mt in 2022. A decline in trading volumes on the EEX exchange and in the OTC market was more pronounced. The drop continued to reflect the overall slump in energy trading Europe-wide over the year as markets normalised following the 2022 energy crisis. Furthermore, there has been a notable shift in utilities' forward hedging behaviour, as seen in the low level of open interest of forward EUA contracts, which has also weighed on EUA trading volumes.

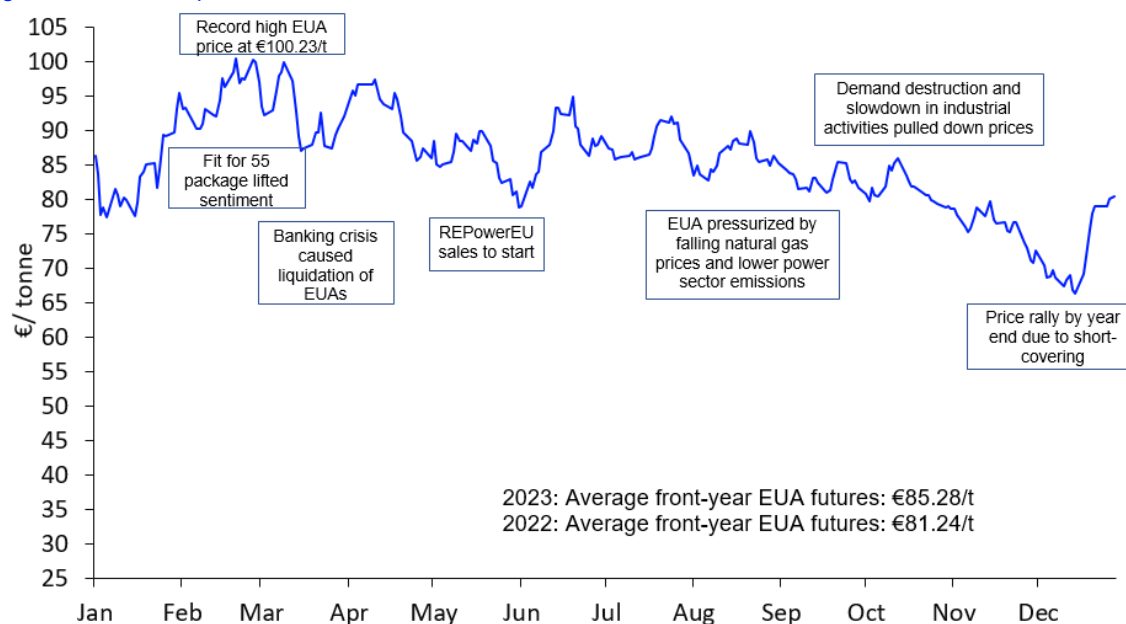
Despite the slight drop in traded volumes, 2023 was a historic year for the EU ETS as the EUA crossed the €100 market for the first time. Zooming in, European carbon prices kicked off the year with substantial upward

momentum in January and February. This was driven predominantly by political forces, including the finalization of key Fit for 55 legislation at the EU Commission, reform of the EU ETS and the Market Stability Reserve – both of which were designed to tighten EUA market balances much more quickly than under the previous scenario. With the additional expectation that EU lawmakers would set a more ambitious emissions reduction target for the Bloc, Dec-23 EUAs hit a record high of €101.25/t on 21 February.

Simultaneously, there was a surge in last-minute buying of allowances by industrial and aviation companies ahead of the compliance deadline, which added further impetus to the carbon price rally. However, a wobble in the global financial markets following on from the collapses of [Silicon Valley Bank](#) and [Credit Suisse](#) prompted a sharp reversal in the price of EUAs, after concerns were raised about a [possible run](#) on the banking sector. Some investors offloaded their EUA holdings to cover margin calls, leading to a sharp increase in offers and prompting the Dec-23 EUA futures contract to drop €15 from the end of February to €85 in mid-March, despite the fact that the compliance deadline for the year had not yet passed.

After the annual compliance deadline passed in May, demand for allowances eased which, in turn, weighed on prices. Further, there was additional downward pressure as power sector emissions fell amid a combination of

Figure 2.1: EU ETS price in 2023



Source: LSEG

Table 2.1: EUA trading by segment (excluding options), 2020-2023

	2020		2021		2022		2023	
	Mt	€ million	Mt	€ million	Mt	€ million	Mt	€ million
EUAs auctioned	779	19,157	583	30,852	487	38,469	518	43,089
EUAs exchange traded	9,345	231,691	11,164	626,357	8,450	685,254	8,376	709,406
EUAs OTC	346	9,022	463	25,085	335	27,325	206	16,940
Aviation EUAs	8	197	9	473	5	411	6	469
Total	10,478	260,067	12,219	682,767	9,277	751,459	9,105	769,903

demand destruction and robust renewables output. Perhaps most significantly, however, the European Commission [announced](#) that they would begin additional allowance sales in July to finance the REPowerEU plan, which sent a bearish signal to the market.

The EU carbon price fell to below the psychologically-significant €80/t threshold in late May, before rebounding to around €90/t in the summer amid halved auction supply during the August holiday period in Europe. Throughout the summer, weekly commitment of traders data from the ICE Endex exchange showed investment funds holding record high net short positions, which prompted a bit of a short squeeze across the market and contributed to the persistent bullishness of the allowance price throughout the late summer.

Stagnating demand for allowances weighed on prices in the final two months of 2023, prompting the benchmark EUA futures contract to hit a year low of €65.99/t on 14 December. Prices then recovered marginally

over the last two trading weeks in 2023 on dip-buying the build-up of new positions for 2024 in anticipation of the tighter allowance supply.

A key feature of European carbon market in 2023 was the return of fuel switching as a major driver of prices, as weaker gas prices drove coal-to-gas switching in the power generation sector. The European TTF gas price fell from €80/MWh at the start of 2023, dropping to €23/MWh in June, and remaining below €40/MWh in the fourth quarter despite the onset of winter. Low gas prices, coupled with a mild winter season across much of Europe, reduced coal plant running hours, curbing emissions and – by extension – allowance demand. As a result, daily EUA auction results became steadily less robust throughout the fourth quarter of 2023, with most auctions less than two times oversubscribed and clearing at substantial discounts to secondary market prices.

In 2023, the clean spark and dark spread showed that gas-fired power generation

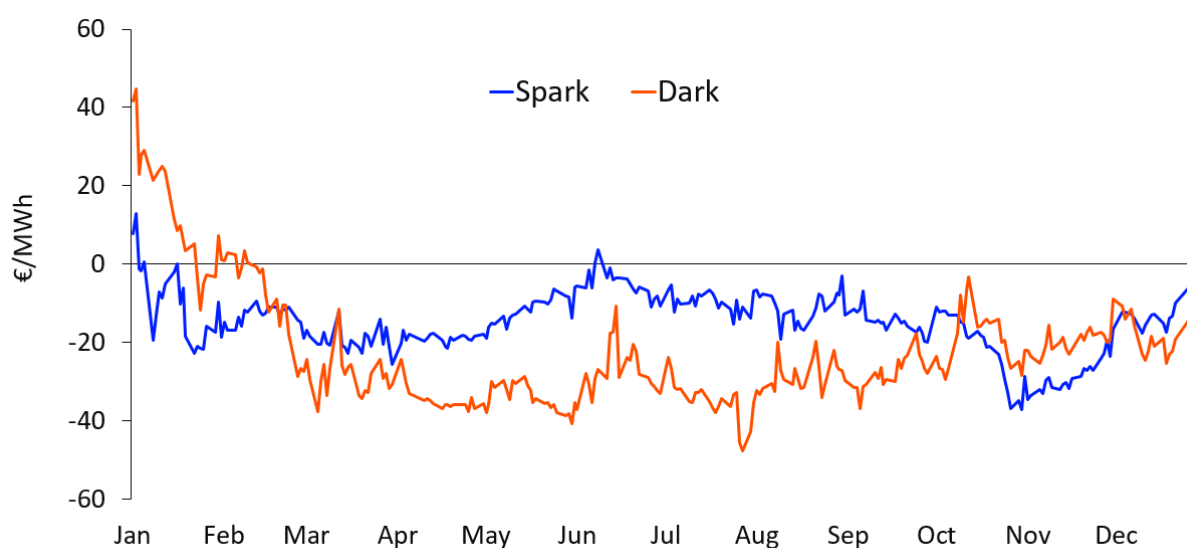
remained competitive over coal-fired generation for most of the year.

POLICY DEVELOPMENTS: PIVOTAL YEAR FOR EU CARBON MARKET WITH FIT FOR 55 PACKAGE IN FOCUS

2023 was a pivotal year for the European environmental and carbon policy. The adoption of the European Commission's [Fit for 55 package](#) to slash greenhouse gas emissions (GHG) by 55% by 2030 has contributed to wide sweeping reform of EU climate policy and has led to renewed focus on the EU's main tool for decarbonisation: the EU ETS.

The year began with Sweden presiding over the six-month rotating presidency of the EU Council, in which Stockholm [set the climate and energy file front](#) and center for the EU's policy agenda. The European Green Deal, and in particular comprehensive EU

Figure 2.2: Front-month Clean spark and dark spread in 2023 (38% coal to 50% gas)



Source: LSEG

ETS reform, were major policy priorities for the Swedish presidency during the Spring 2023 legislative session. Final adoption of EU ETS was achieved in April 2023 as the co-legislators of the EU, the Council and Parliament, gave their final sign off on the legislation. The road to legislative adoption for this critical piece of the EU Green Deal [received](#) a wide majority of support in the European Parliament with 487 votes in favour and 81 votes opposed. Despite the rise in support for nationalist political parties throughout much of the EU in 2023 reflected in electoral successes in member states across the block, the EU ETS still garners significant support from all corners of the EU political spectrum.

Key [highlights](#) of EU ETS reform:

- Raising the allowance reduction (cap) from 43% by 2030 to 62% by 2030
- The creation of an ETS II for fuels from buildings and roads to begin in 2027
- The creation of the EU's first ever €65 bn Social Climate Fund (SCF) to fund the "just transition."
- The adoption of the EU's Carbon Border Adjustment Mechanism (CBAM)
- The inclusion of the maritime shipping sector into the EU ETS for ships over 5 000 tonnes.

In tandem with the successful adoption comprehensive EU ETS reform, Commission President Ursula von der Leyen announced the proposal of the [Net Zero Industry Act \(NZIA\)](#): a green clean-tech bill that aims to counter the landmark American climate legislation, the Inflation Reduction Act, adopted by the Biden administration across the Atlantic. For an in-depth look at the IRA and NZIA, please see our rolling series available on Workspace.

While EU ETS reform may have been adopted without major political hurdles, the NZIA faced political challenges almost immediately after the proposal was announced. In the original draft text, the NZIA proposed that technologies that are deemed as "[strategically net zero technologies](#)" would benefit from expedited permitting processes, loosened rules regarding state aid, and new sources of financing from the EU. Although many technologies remain uncontroversial to receive such benefits, such as wind turbines or PV solar panels, the issue of how to consider nuclear power technologies resulted in a [public spat](#) between the EU's two largest economies.

In July 2023, Spain took over the baton from Sweden as the rotating President of the EU Council and was [able to cobble together a workable agreement](#) between France and Germany that allowed for the sausage making process of EU policy to move ahead. A deal was brokered by Madrid in which some state aid would be permitted for nuclear power technologies under certain conditions, which allowed for the policy engine of Brussels to move forward on the climate and energy transition agenda, paving the way for full adoption of the remaining elements of the Fit for 55 policy package.

From a political perspective, 2023 has been a turning point in European politics at the member state level. Nationalist and far-right political parties have gained support in recent elections across the Bloc including in the [Netherlands](#), [Bulgaria](#), and [Slovakia](#). [Recent polling](#) also suggests that nationalist and climate-skeptic politics is gaining or maintaining support in the EU's three largest countries Germany, France, and Italy.

Despite the prominent rise of nationalist and climate-skeptic political forces in Europe – which can in part be attributed to the EU's ambitious climate agenda -- the [Polish national election](#) resulted in the opposite, with a new pro-EU government led by former Prime Minister and former President of the EU Council Donald Tusk brought to power in Warsaw. Since taking over, Tusk's three-party coalition has already been on a campaign of resetting relations with Brussels after 8 years of strain with the nationalist Law and Justice party. The change in government in Poland is significant for EU climate policy more broadly, as Poland had previously been the main opposition voice for much of the EU Green Deal. [Tusk has already announced](#) that the climate agenda and phasing out the coal in an expedited manner is an important priority for his new government.

KEY EU CARBON MARKET DEVELOPMENT: CBAM

The adoption of the world's first Carbon Border Adjustment Mechanism (CBAM) was a major milestone for the EU's decarbonization pathway. CBAM is a policy instrument that when fully phased in at the EU border will levy the full EU price of carbon on imported goods from third countries. The climate policy instrument has been adopted by the EU with two specific aims: address the issue of carbon leakage and support European competitiveness. Carbon

leakage occurs when the carbon costs in a specific region cause production of ETS covered sectors to move offshore where environmental standards are not as stringent. Free allocation of EUAs has been used to address the issue of carbon leakage in the EU ETS, however between 2024 and 2034 CBAM will be gradually phased in while free allocation will be phased out of the market. CBAM has also been adopted by the EU as a means to "level the playing field" between enterprises operating in EU ETS covered sectors and foreign companies that may not have the same costs of pollution incurred on them by their respective governments outside the borders of the EU. Therefore, the abatement costs between foreign and domestic EU firms will be equalized when the policy is fully phased in.

The adoption of CBAM has wide-ranging implications for not only the EU economy, but importantly, for third country firms which trade with the EU single market. Not only will the implementation of this policy cause foreign ETS covered sector firms to incur a new cost of carbon, but one significant lasting effect of CBAM will be the standardization of carbon accounting rules across the globe. Any ETS sector firm that would like to trade with the EU will have to abide by these rules, therefore the Brussels regulatory effect may indeed have wide ranging consequences on how carbon accounting is done around the globe and the EU has now set the golden standard with CBAM.

CBAM does run the risk of causing trade diversion from important trading partners such as the UK, the US, India, and China. The policy is designed so that prevailing carbon pricing systems in third countries may be used to lower CBAM obligations for importing firms, opening the window for raising the climate policy bar in third countries. While CBAM may be a geopolitical tool to encourage other countries to also raise their own climate policy ambitions through carbon pricing schemes, time will tell if trade diversion away from the EU may have negative economic impacts on both the EU's and third countries economies.

OUTLOOK FOR 2024: BEARISH FOR CARBON AMID MEGA ELECTION YEAR

European Carbon prices have kicked off 2024 on a bearish note, losing €17 over January amid pressure from REPowerEU sales and weak fundamentals. This followed a bearish Q4 2023 where carbon prices

dropped sharply ahead of the end of the year. This was very closely tied to the weak gas market, which did not experience a seasonal rally amid a mild start to the winter. Additionally, economic growth is likely to remain sluggish in the near term across Europe and is expected to lead to further demand destruction from many of the industrial sectors covered by the EU ETS.

Amid these headwinds, it is unlikely that the EUA market will be able to sustain itself much above €80/t -- if that -- throughout the first quarter of the year. Further, the impact of REPowerEU cannot be overstated here; the market would have been facing bearish headwinds anyway, but the front-loading of allowances in order to finance renewables investment across the Bloc means that there will be plenty of supply available via the generous auction calendar to meet any incremental demand throughout the year.

Consequently, it is also unlikely that EUAs will average above the headline €100/t level until 2027, barring significant changes in policy. There is likely to be a bit of a rally in prices as compliance entities source supply ahead of the new compliance deadline which should add some support going into the fourth quarter.

The introduction of shipping into the ETS from 2024 is also likely to bearish for EUA prices in the short-to-medium term. While the cap has been increased to accommodate shipping's entry into the ETS at the start of the year, it is unlikely that there will be sustained buying from the bulk of the industry to meet 2024 obligations this far ahead of the 2024 compliance deadline, which will be in 2025.

The CO₂ switching price – or the theoretical carbon price whereby the short-run marginal costs of coal and gas power generation are equal – is a commonly-used proxy for the carbon price and a good indicator of the hedging strategy of major utilities, still by far the largest buyer of EUAs. This proxy is going to remain a driving factor in the movement of EUA prices in 2024.

While the Commission has already announced that it is planning to pursue a 90% reduction target, a shock result in the European Parliamentary elections could potentially throw a wrench in more climate policy development. It is expected that nationalist and climate skeptic parties will perform well in the upcoming elections, which may make further action on climate untenable in the next EU Parliament. [A second term](#) for Ursula von der Leyen as President of the EU

Commission would be supportive for climate policy, as she has stacked much of her political reputation on the EU Green Deal, but what the majorities will look like in the Parliament may be an even more important factor on determining what legislative files are prioritized after the June elections.

The [European Commission has proposed](#) a 90% reduction target for 2024 in its communication. While this is in line with what the EU climate commissioner and Green Deal chief voiced support for last autumn, it is also the lower boundary of the 90%-95% range recommended by the European Scientific Advisory Board on Climate Change. The proposed 90% target for 2040 has largely already priced in by market participants, barring a significant change in its scope as it works its way through the EU negotiating process.

Climate policy will remain a central point of debate for many candidates in the EU election, but we do not expect comprehensive EU ETS reform to take place in the immediate aftermath of the elections in June. Topics such as how to reduce agricultural emissions, reducing industrial emissions, and the role of clean green tech in the climate and energy transition, particularly through the NZIA, will likely be more important talking points for candidates campaigning for European Parliament rather than tightening the screws on the EU ETS which has just gone through a large structural transformation.

3. UK ETS

United Kingdom Allowances (UKAs) traded at a substantial discount to their EU counterparts throughout 2023, with the differential between the two averaging roughly €22 (approx. £18.75) throughout the year. Traded volumes in the UK Emissions Trading System (UK ETS) were up 19% from 2022, showing a significant increase in market liquidity in its third year of operation. At about £30.7 billion, total market value remained proportional to that of the EU Emissions Trading System (EU ETS) given the relative size of the markets and volume of covered emissions.

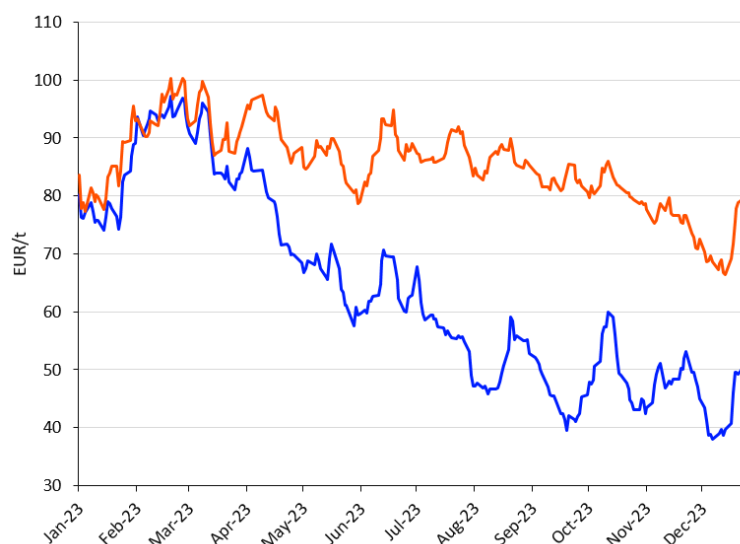
MARKET DEVELOPMENTS: UKA DIVERGES SHARPLY FROM EUA MARKET

UKA prices slumped heavily in 2023, diverging sharply from the EUA market (see Figure 3.1) after pricing above EUAs throughout much of 2022. There were a number of different factors prompting this, but one of the most significant has been expectations of rising allowance surplus in the UK ETS which does not currently have a market stability reserve mechanism to manage it like the EU. The differential between the two allowance markets averaged €22 (approx. £18.75) over the course of the year, but it started out the year closer —ranging from €10 (approx. £8.50) in April before rising to a record €45 (approx. £38.40) in September. The differential narrowed slightly in the last quarter of 2023, but sentiment in the UK ETS remained bearish, with UKAs closing the year at a €27 (approx. £23) discount to EUAs.

Some 529 million UKAs were transacted in the spot and futures markets via exchanges, although the bulk of volume was traded on December 2023 futures contracts. In addition, 78.73 million UKAs were sold at auction, with traded volume totaling 607 million tonnes (Mt), an increase of 19% from 2022, indicating a moderate uptick in UK ETS liquidity.

This tally excludes over-the-counter transactions, which are often opaque and difficult to quantify; however, given that

Figure 3.1: UKA and EUA prices



Source: LSEG

covered emissions in the UK ETS are about 7% of the volume of covered by the UK ETS, the two schemes are comparable in terms of turnover. Total market value was also proportional to the EU ETS, with UK ETS transactions collectively worth some £30.72 billion (approx. €36 billion) or about 5% of the EU ETS's €770 billion (approx. £657.1 billion) market value in 2023. Trading turnover fell 22% due to lower prices. The UKA price averaged around £55.4 (approx. €65) in 2023, down 34% from the 2022 average.

Commitment of Traders (CoT) data from the Intercontinental Exchange (ICE) indicates that financial investors remained net short on the UK ETS and were bearish overall throughout the second half of 2023. Investment Funds became net short UKAs at the end of July, while operators steadily increased their net length from late June, albeit very slowly.

The UK ETS reform package [announced](#) in July, will see the cap cut by 30% from 2024, but the government also announced they would add an additional 53.5 million of unallocated UKAs into the market over the next three years to "smooth the transition" — a move that the market viewed as decidedly bearish given surplus inventory.

The surplus of allowances is set to remain a challenge under the existing cap structure, although following the dive in prices after its initial reform package was announced, the UK government accepted the recommendation to set out a long-term pathway for the UK ETS. [This led to the publication](#) of several regulatory updates in December 2023 from the ETS authority, which set out the intention to continue the ETS beyond 2030 and until at least 2050. However, additional UK ETS reform is likely to be affected by broader UK political uncertainties with an election expected in Autumn 2024, although it could be called sooner.

Unlike the EU ETS, the UK ETS does not have a market stability reserve (MSR) to manage the cumulative oversupply of allowances, though the UK government is [exploring](#) bringing one in. In December 2023, the UK ETS authority [revised](#) allocation volumes downwards by 0.6 Mt, tightening the UK ETS balance slightly, although the market is set to remain in surplus throughout the balance of the decade, according to the LSEG supply and demand model (see below).

POLICY DEVELOPMENTS: UK ETS REFORMS SHAKE MARKET

The Conservatives have been in power for 14 years and are facing an uphill political battle to hold on to power. In an attempt to garner favour with voters, Sunak's government has revised some of the UK's previous climate commitments downwards, [delaying the internal combustion vehicle \(ICE\) ban](#), [watering down household heating](#)

Table 3.1. UKA trading in 2023, auctions and exchange*

	Mt	£ Million	€ Million
TOTAL UK	607	31,664	36,353
UKA Auctions	78.7	4,203	4,814
UKA Exchange trades	529	27,462	31,539

*These volumes exclude OTC transactions

[standards](#), and [issuing new licenses for oil and gas drilling in the North Sea](#), among other things. None of these decisions have been supportive of UKA prices. Furthermore, the independent government [contracted Climate Change Committee has come out against these policy changes](#), claiming that they are not compatible with a net-zero pathway for the UK.

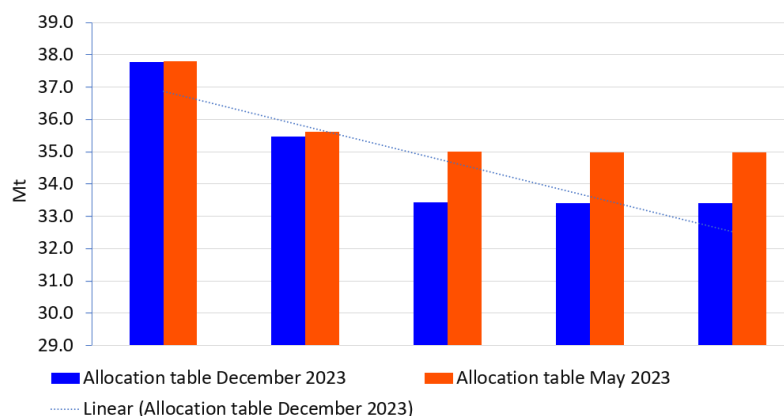
Although the UK ETS has not gone through a transformational policy tightening in 2023 like its European counterpart, the UK Department for Energy and Net Zero has announced several upcoming changes that will have significant impacts on the policy trajectory of the British carbon market.

The UK has [announced](#) that it will bring the shipping industry into its ETS from 2026, although the EU brought shipping under its ETS in 2024, marking the first time since the two markets split that the industries covered under the respective schemes have varied. The introduction of the shipping sector to the EU ETS has proved to be initially bearish given the increase in the allowance cap to accommodate it, even though demand is unlikely to pick up this far ahead of the 2024 compliance deadline.

Additionally, the UK government [announced](#) that a new Carbon Border Adjustment Mechanism would be implemented by 2027 for high-emitting ETS-covered sectors including aluminum, cement, fertilizer, glass, hydrogen, ceramics, iron and steel. Similar to the EU's CBAM, this decision targets the challenges posed by carbon leakage and helps bolster a pathway forward to phase out free allocation; additionally, it helps to tackle at least some of the UK's exposure to the EU CBAM. Throughout 2024, the government is planning to undertake a comprehensive consultation on how to best execute the policy.

Finally, in a move that would diverge significantly from the EU ETS, the UK ETS authority [announced](#) in 2023 that the government would explore the potential for GHG removal technologies and nature-based solutions to be integrated into the UK ETS. A consultation on how this potential proposal would be implemented is expected in 2024. While the EU is also exploring a possible role for removals in its own ETS, the UK is currently aiming to introduce them on a faster timeline.

Figure 3.2: UK ETS allocation update (March vs December) for 2021-2025



Source: LSEG

OUTLOOK FOR 2024: FURTHER UK ETS REFORM ON THE TABLE

The UK government has accepted the [recommendation](#) from the Climate Change Committee to set out a long-term pathway for the UK ETS, and the ETS Authority published several related regulatory updates in December 2023. Subject to agreement with the Authority, this pathway will set out intention to continue the ETS beyond 2030 and to at least 2050. However, additional UK ETS reform is likely to be impacted by political uncertainty given the upcoming 2024 election which is set to be protracted and heavily focused on environmental policy.

UK Prime Minister Rishi Sunak has already indicated that he intends to make the UK's environmental policy a major focal point of the 2024 election campaign, even though a date for polling has yet to be set. There are stark differences between the Prime Minister's Conservatives and Opposition Labour on climate, energy transition and transportation policy, and all of these have already been identified as a key election issues. As of current writing, Labour is [nearly 20 points](#) ahead in the opinion polls.

LSEG has built a fundamental model to project the market balances and prices in the UK ETS to 2030. Similar to the LSEG EU ETS price forecasting methodology, this bottom-up model consists of detailed modelling of UK Power and Industry sectors, allowance supply, and market behaviour. The UK ETS price forecast is projected based on an econometric model analysing

the relationship between perceived market balances and allowance prices.

Table 1 shows the UK ETS price forecast from January 2024, which reflects the sharp drop in the UKA price throughout the fourth quarter of 2023. The average Dec-23 price throughout 2023 was £55.4/t, but was £41.22/t in Q4 2023.

In 2024, the average UKA price is set to hit a fresh low, averaging £44.1/t and is not set to breach the 2023 average of £55.4/t until 2027. This will see the differential between the UKA and EUA continue to widen out to 2030 and beyond, barring significant policy reform in the UK, particularly the introduction of a mechanism to manage the expanding UKA surplus.

The model also considers the market behavior and the close link between UK and EU ETS. At least half of the participants in the UK ETS also trade in the EU ETS. Despite the increase in liquidity in the UK ETS in 2023, it remains quite low compared to the EU ETS due to the market size. Many compliance entities in the UK ETS conduct forward hedging in EUA futures and only swap them into UKAs shortly ahead of the compliance deadline. Consequently, UK ETS market participants typically have a much shorter forward-looking horizon – between one and two years – when compared with participants in the EU ETS. The anticipation that UK ETS oversupply will persist into the next decade unless substantial market reform measures are introduced will likely keep this pattern in the near term. Nevertheless, there has been growing speculation that the UK and EU may pursue stronger linkage between their carbon markets in the future, prompting the allowance prices in the two markets to eventually converge.

Table 3.2: LSEG UK ETS price forecast January 2024

	2023	2024	2025	2026	2027	2028	2029	2030
UKA price forecast (January 2024, £/t)	55.4	44.1	47.7	55	57.6	63.1	67.4	80.2

4. North America

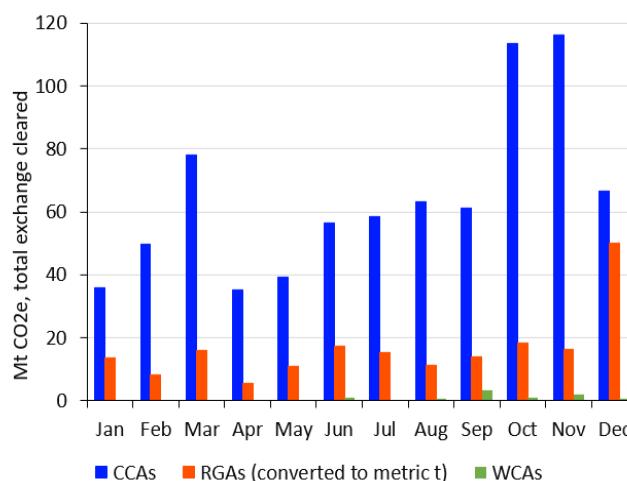
2023 saw record high allowance prices across all three major North American compliance markets, including Washington's Cap-and-Invest program which held its first auction in February 2023. Auctions for all three programs maintained a perfect record of oversubscription, meaning that all allowances offered over the year were sold. In the WCI market, California Carbon Allowances (CCAs) v.2023 started the year at \$29.35/t and finished at a record high above \$39/t. Price movements for RGGI allowances (RGAs) Dec-23 v.2023 were much more stable, holding between \$13 and \$15/t throughout the year with an average price of \$13.88/t. On the Intercontinental Exchange (ICE), Washington Carbon Allowances (WCAs) ranged from \$51 to \$70.5/t during its first year of trading.

MARKET DEVELOPMENTS: WASHINGTON MARKET COMES IN WITH A BANG

Market value increased in the aggregate in the WCI, RGGI, and Washington markets, making 2023 a pivotal year for North American carbon trading. The Washington Cap-and-Invest program launched in February, covering many of the same sectors featured in the California market, including electric utilities, natural gas suppliers, refineries, fuel suppliers, and manufacturing & industry.

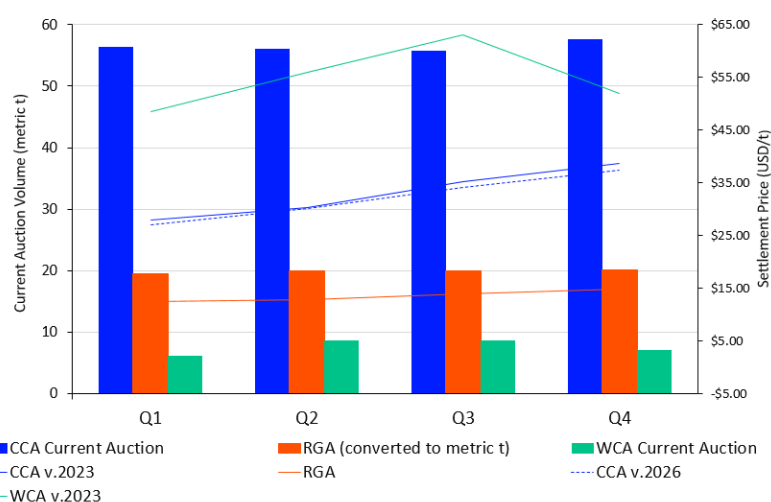
All three regional compliance markets use auctions to introduce new volumes. In terms of secondary market trading activity, ICE data indicates CCA volume peaked in October and November of 2023. During these months, the traded volume of futures contracts hovered between 100 million tonnes and 120 million tonnes. On the other hand, the highest volume of traded RGGI contracts was in December at around 50 million tonnes. Throughout the first half of 2023, WCI allowance prices increased steadily, ending the second quarter close to the \$33/t. Price appreciation was more dramatic across the second half of the year, with allowance prices concluding the year above \$39/t, the highest in program history. Prices in the RGGI market were also buoyant in 2023 and closed the year at fresh highs. Despite occasional periods of price volatility, RGGI year-end prices closed the year above \$15/t (see Figure 4.1). WCI and RGGI secondary prices were a result of their respective historic auction settlements. The WCI Q4 auction concluded the year at \$38.73/t, a 40% increase from the Q1 \$27.85/t clearance. RGGI auction prices saw steady upward movement throughout 2023, with a

Figure 4.1: CCA, RGA and WCA exchange traded volumes in 2023



Source: ICE and Nodal

Figure 4.2: Auction Volumes and Settlement Prices



Source: CARB, RGGI, WA Department of Ecology

particularly strong Q4 auction settlement at \$14.88/t. The Q4 settlement price is notable because it triggered the RGGI Cost Containment Reserve (CCR) for the first time since 2021, releasing an additional 5.56 million allowances into the market.

By contrast, the [Washington Cap-and-Invest program](#) ended the year on a distinctly bearish note relative to its mid-year \$70.50/t peak. A product of the Washington Climate Commitment Act (CCA), the program made history by posting the three highest auction clearances in North American compliance market history at \$48.50/t, \$56.01/t, and \$63.03/t, with both the Q2 and Q3 auctions breaching the \$51.90/t Auction Price Containment Reserve (APCR) threshold, triggering two subsequent APCR auctions. However, in an unexpected change in policy, Washington's Department of Ecology (ECY) opted to [offer 5 million allowances](#) at \$51.90/t in the second APCR auction which

had a profoundly bearish effect on the market and sent prices into backwardation for the first time, which held until the final Q4 auction. The final auction of the year ended below market expectations at \$51.89/t and failed to clear the lower Tier #1 APCR threshold by one cent.

POLICY DEVELOPMENTS: FURTHER MARKET REFORMS ON THE TABLE

A November WCI workshop presented findings made by two separate modeling teams contracted by the California Air Resources Board (CARB) and the Quebec Ministry of Environment (MELCCFP). The teams modeled various emissions reduction scenarios (40%, 48%, 55%) and their effects on carbon allowance prices. California and Quebec modelers found that under all emissions reduction scenarios, allowance prices would increase, with the greatest increase in prices expected under the largest emission reduction

scenario. The implications of the workshop were clear: allowances removed from future budgets would decrease supply and increase prices. Modelers found that under modeled alternative price scenarios, allowance prices would hit \$145/t in 2035 and \$180/t by 2040. It is still not known which emissions reduction scenario CARB and MELCCFP will choose. Further, CARB will need to decide from which allowance pool it will aim to remove allowances: 2013-2020 Price Ceiling, 2013-2030 APCR, or the 2025-2030 Auction & Allocation.

WASHINGTON EXPLORES LINKAGE WITH CALIFORNIA AND QUEBEC MARKETS

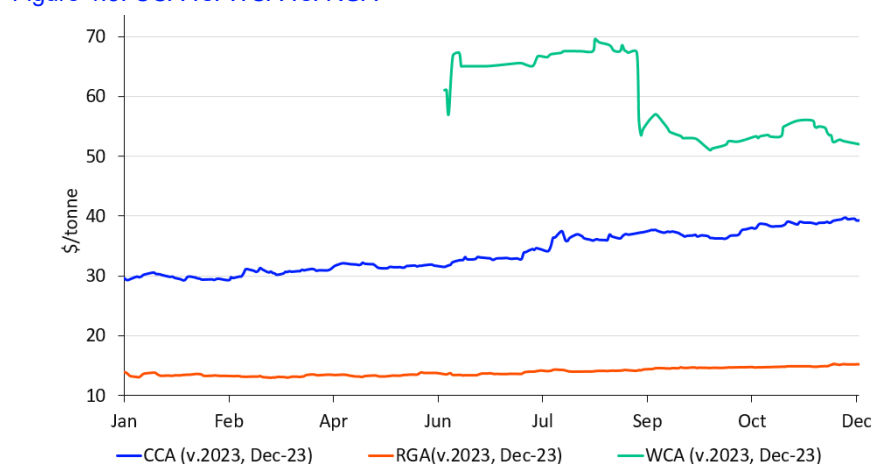
ECY officials made clear their intentions to link the Washington market with California in a 97-page paper entitled [Cap-and-Invest Linkage Criteria: Preliminary Analysis Report](#). The report contends that a joint Washington-California-Quebec market would improve market stability, increase market liquidity, and galvanize investment activities. The current California-Quebec market will now need to conduct a thorough review of possible linkage and weigh any benefits or potential obstacles associated with a wider regional market. A linked Washington-California-Quebec market would feature joint allowance auctions and offer a shared market price. Moreover, allowances could be used to cover emissions in any of the three jurisdictions. Such allowances could be traded between entities across all three regions.

PENNSYLVANIA AND VIRGINIA RGGI MEMBERSHIP UNCERTAIN

In early November, the Pennsylvania Commonwealth Court delivered a pair of decisions ruling that Pennsylvania's participation in the Regional Greenhouse Gas Initiative (RGGI) was unconstitutional. The Commonwealth Court -- the Appellate branch of the Pennsylvania judicial system -- found former Governor Tom Wolf's 2019 decision to join RGGI to be a breach of executive powers. The decision wasn't much of a surprise to the market, but it did highlight the challenges of introducing carbon pricing in different state legislatures, particularly in the absence of a national system in the US.

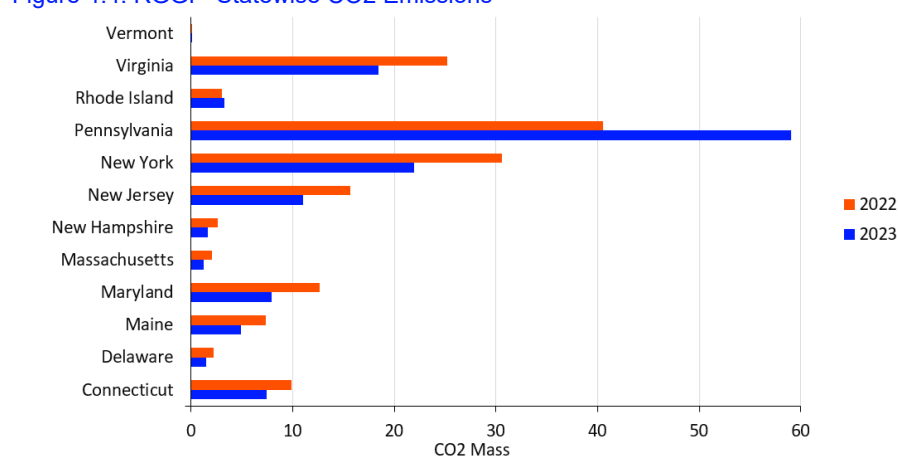
Similarly, in June of 2023, Virginia Governor Glen Youngkin [made](#) the unprecedented and highly controversial decision to circumvent a legislative vote and instead have the Virginia Air Pollution Control Board (APCB) decide Virginia's RGGI membership status. The APCB voted [4-3](#) in favor of removing Virginia from RGGI, with a deadline of December 31, 2023 to exit the initiative. Several environmental organizations

Figure 4.3: CCA vs. WCA vs. RGA



Source: ICE

Figure 4.4: RGGI - Statewise CO2 Emissions



Source: RGGI

have filed lawsuits against this decision. The matter is currently under legal consideration in the Virginia Court system.

The extended legal battles in Virginia and Pennsylvania are likely to continue throughout 2024. For entities participating in the RGGI market this uncertainty might not be welcome. Compliance entities and managed money participants structure their trading strategies based on cohesive and well-established markets. Ambiguity surrounding market participation and size could make trading decisions more difficult.

OUTLOOK FOR 2024: BULLISH WCI, RGGI; BEARISH WASHINGTON

It is expected that the current bullish price trajectory will continue in the WCI and RGGI markets, while the outlook for the Washington market remains bearish with prices expected to decrease in the coming months. Policy decisions made by regulatory entities fundamentally shape the structure, trajectory, and market expectations of carbon markets, including North America. Public workshops conducted by CARB

and MELCCFP will continue to drive auction and futures prices. Additionally, further WCI workshops in 2024 will provide clarification and detail in respect to allowance supply cuts and the various emissions reduction scenarios. Our 2024 price outlook for the WCI program forecasts CCA prices of an average of \$42.75/t in 2024, with a bullish long-term forecast with prices above \$50/t in 2025. Any amendment to the WCI emissions reduction scenarios could impact those forecasts, depending on whether CARB and MELCCFP announce unexpectedly ambitious or unambitious targets.

In the RGGI program, states will initiate individual legislative updates based on the updated [Model Rule](#), which will pertain to future allowance supply and program structure; the ultimate fate of Virginia and Pennsylvania membership in the program will also likely have an impact on market expectations in this regard. Our long-term RGGI forecast does not reflect any possible changes in state participation. Allowance prices are set to average \$14.95/st. Future linkage between Washington-WCI linkage is expected in 2024, as well as more details about New York's Cap-and-Invest program.

5. China

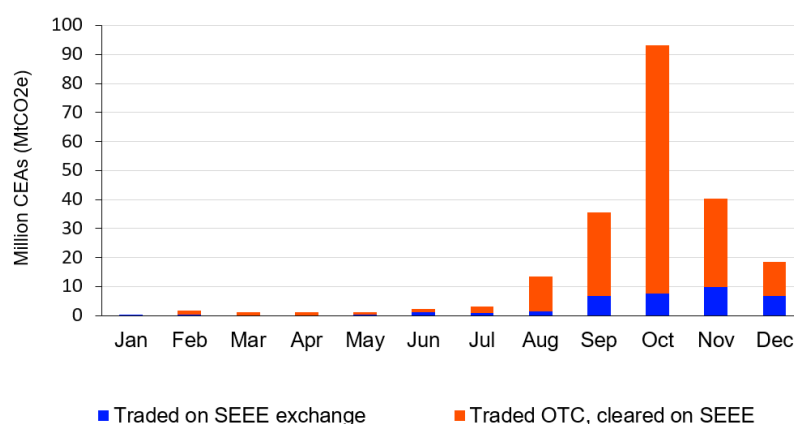
China's national Emissions Trading System (ETS) saw its second compliance period, covering emissions generated in 2021 and 2022, draw to a close in 2023. Compared with the first compliance period, the market became more active and significantly more structured. Regulated entities have become more familiar with the allowance trading process and the surrender of allowances in the registry system since the conclusion of the first compliance period. Transactions rose dramatically over the second half of 2023 ahead of the compliance deadline late in the year. China issued a number of new policy documents to govern the national ETS, and also began the process of rebooting the Chinese Certified Emission Reduction (CCER) offsetting scheme which had been suspended for several years. The relaunch of the CCER program in the second half of 2023 prompted a significant boost in traded volume in 2023, with over 15 million tons of CCERs transacted; the market is set to fully launch with new credits in 2024. While transacted volume increased across the Pilot ETSs, prices largely fell, apart from in Shanghai and Shenzhen.

NATIONAL ETS MARKET DEVELOPMENTS: PRICES HIT NEW HIGHS AS TRADING VOLUME SURGED BEFORE DEADLINE

The second compliance period for China's national carbon market formally closed on the last trading day of 2023, after operating for 242 trading days, from January 3 to December 29. Trading activity was subdued over the first half of the year, but picked up sharply across the second half, likely supported by the earlier allowance distribution in August. The total number of CEAs traded in 2023 was nearly 212 million tonnes, with a total turnover of CNY 14.44 billion (approx. €1.89 billion).

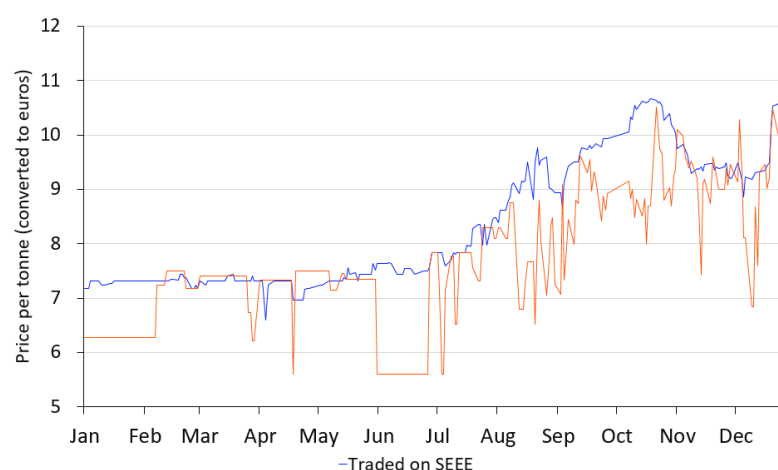
Bilateral (OTC) transactions totalled about 177 million tonnes and accounted for 83% of trading activity, while listed (Exchange-based) transactions were around 35 million tonnes. October was the busiest month for China's national market, accounting for nearly 44% of the total traded volume in 2023 alone. Eighty percent of all volume was traded between September and November in the run up to the deadline (see figure 5.1). Turnover for listed trades was about CNY 2.6 billion (approx. €335.50 million). Meanwhile, in line with the pattern of volume, OTC trades accounted for larger part of the turnover of

Figure 5.1: Chinese national ETS: daily traded volumes over 2023



Source: LSEG

Figure 5.2: CEA Prices in 2023 (UNIT: €/t Exchange Rate: 1 EUR= 7.6583 CNY)



Source: LSEG

the year at about CNY 11.87 billion (approx. €1.55 billion). The total turnover of 2023 was more than 5 times that of 2022 where CEA transactions were only worth about CNY 2.81 billion (approx. €385 million) with the absence of a compliance deadline.

CEA prices saw sustained upward momentum for most of the second half of 2023. The overall CEA weighted average price in 2023 was CNY 68.15/t (approx. €9), up 23% from the weighted average price in 2022. The closing price on December 29 was CNY 79.42/t (approx. €10), up 44.4% year-on-year. Traded prices in both the listed and OTC markets rose in 2023, up 28% and 22% respectively.

Free allocation of CEAs started in the first half of August, which opened up trading activity for this compliance period earlier than in 2021. Both the CEA price and bilateral daily average price broke fresh all-time highs in July, August, September and October,

with the most recent all-time high seen October 20 at CNY 81.67/t (approx. €10.5). Overall, prices for listed trades ranged from CNY 50.50/t (approx. €6.5) to CNY 82.79/t (approx. €10.5) in 2023. The bilateral daily average price reached its all-time high on October 23, at CNY 80.51/t (approx. €10.5).

CEA transactions started winding down in late November and December due to the 95% compliance rate deadline (see below). Although traded volumes fell, prices remained relatively supported in the runup to the final deadline, with transactions bouncing slightly in the last week of the year both in price and traded volume. This is likely linked to last minute buying from some regulated entities, low liquidity ahead of the New Year, and 'window dressing' by CEA holders looking to boost carbon portfolios rolling into 2024.

Due to the SSEE's new policy of splitting CEAs into different vintage years (see

below), there were visible differences in prices between different vintages. The intraday spreads for listed trades were about CNY 9.00/t (approx. €1), while spreads for OTC trades were much wider, with the widest as high as CNY 30.07/t (approx. €4).

NATIONAL ETS POLICY DEVELOPMENTS: CHINA NATIONAL ETS CONCLUDES SECOND COMPLIANCE PERIOD

2023 marked the end of the second compliance period for the Chinese national ETS, covering emissions generated by regulated entities in 2021 and 2022. As with the first compliance period, the second compliance period only covered power generation. Power generators in Beijing, Tianjin and Guangdong (without Shenzhen) joined the national ETS for the second compliance period, bringing the volume of total covered emissions to around 5 billion tonnes, covering approximately 2200 more entities. Carbon emission allowances (CEAs) allocated in the first compliance period and not retired were permitted to be used by entities to meet obligations in the second period.

There were a number of significant policy developments throughout the year which had substantial impacts on the operation of the National ETS and sped up compliance from regulated entities ahead of the end-of-year deadline. In February, the Ministry of Ecology and Environment (MEE) [released](#) a notice about the emission report and verification work from 2023-2025 for the power sector, requiring entities to report their annual emissions by the end of March and complete emission verification by the end of June. In March, the MEE [released](#) the allowance allocation plan for 2021 and 2022 which tightened the allowances by least 6% from the first compliance period. The legal basis of China's national ETS – the

Interim Regulations on the Administration of Carbon Emission Trading – was on the State Council's legislative work plan for 2023 and [released in February](#) 2024.

The trading session was brought forward in 2023, which also moved the peak period earlier when compared to the first compliance period, with peak trading activity hitting in September, October, and November. Allowances for the second compliance period were [allocated](#) from 11 August, which allowed entities to start trading earlier, boosting liquidity. Further, the March notice also indicated that 95% of the compliance obligation should be completed before 15 November and 100% before 31 December, which prompted many entities to begin covering required emissions earlier than in the first compliance period.

However, after prices surged in the second-half of the year, the MEE updated the bailout policy in July to further ease the burden on regulated entities, allowing those entities with an allowance shortage to advance their 2023 allowances to meet the obligation for 2021 and 2022. This policy cut short some immediate market demand for CEAs ahead of the compliance deadline and prompted a sharp drop in CEA prices in October.

In August, the Shanghai Environment and Energy Exchange (SEEE) [announced](#) that CEAs would be tagged by vintage year, with the exchange disclosing trading information of both listed trades and OTC trades of three types of CEAs – CEA19-20, CEA21 and CEA22 – as well as a composite price of the three combined products. This aroused speculation from market participants that the introduction of vintages to the CEA market could open the door for limiting which vintages can be claimed against specific compliance periods, potentially eliminating the accumulating allowance surplus from future compliance periods. There has so far been no change in policy about which allowances can be claimed during different

compliance periods.

Additionally, the MEE strengthened reporting requirements from regulated entities with key parameters and data filed monthly and overseen by provincial environment departments. It also tightened monitoring and data quality requirements, permitting licensed third-party institutions to check and identify outlier data, with the ministry also able to assess the data quality on demand.

In May, the MEE launched a research project to study the key challenges faced by the introduction of additional industries to the ETS. Several workshops which looked at individual industrial sectors were held over the following months, with the MEE [releasing](#) a notice requiring industrial entities in petrochemicals, chemicals, building materials, iron and steel, non-ferrous metals, paper making and aviation to report and verify their emissions in the third compliance period of 2023-2025. Entities in the cement, aluminium and iron and steel industries have an earlier verification deadline than other industries, and also have new accounting and reporting instructions. This has raised market expectations that they are likely to be the next targets for expansion of the national ETS.

PILOT ETS MARKET & POLICY DEVELOPMENTS: CONTINUE TO RUN ALONGSIDE NATIONAL ETS

China's regional pilot ETS systems remain operational and run in parallel to the national ETS, and typically include additional large-emitting sectors that are not included in the national system, which is currently limited to the power sector. The other sectors under compliance obligation vary by region. In 2023, because China's national ETS did not expand to include more sectors, the number of enterprises and the scale of emissions covered by the pilot ETSs remained stable.

The total volume of transactions in the pilot ETSs increased by 32% in 2023 compared

Table 5.1: China carbon market segments 2020-2023

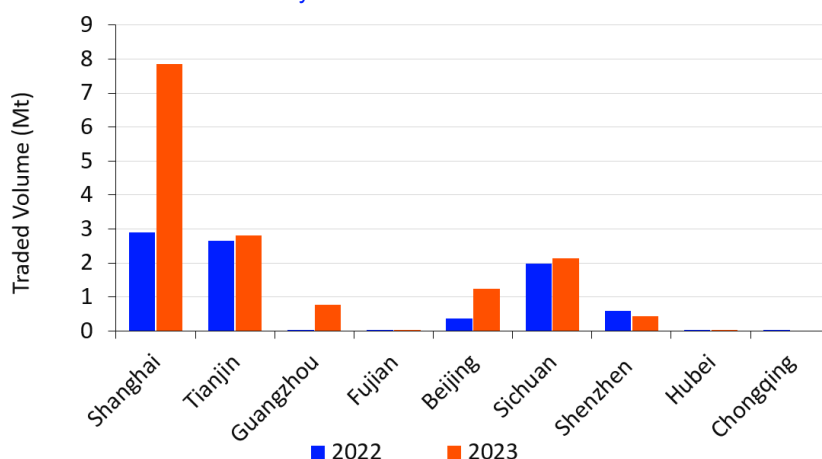
	2020		2021		2022		2023	
Pilots	Mt	€ Million	Mt	€ Million	Mt	€ Million	Mt	€ Million
CEAs	N/A	N/A	179	1,003	51	385	211	1,886
Pilots (combined)	71	257	64	286	52	370	68	378
CCERs	63	N/A	170	N/A	9	N/A	15	N/A
Total*	134	N/A	412	1,289	112	755	294	2,264

* Volume includes allowance units for pilot ETSs and for national ETS. Plus CCERs. Value includes only allowance units for pilots and national ETS (CCERs are mainly traded OTC, there is no source for full overview of prices). Transactions of local offsets units in the separate pilots are of very modest size and not included in our assessment.

to the previous year, but the average transaction price fell by 22%, resulting in a proportionate rise in total turnover of only 2%. In 2023, many enterprises covered by the pilot ETSs contested the authorities' plans for continued tightening of the allocation plan amid decreasing economic growth and, as a result, many pilot allocation plans remained essentially the same as in 2022, without imposing more stringent emission restrictions. In November 2023, [Shanghai](#) and [Chongqing](#) issued new policies that permitted some enterprises to advance their allowances for the 2023 compliance year in order to meet their compliance obligations for the earlier compliance period; this move echoed a similar decision from the [National ETS](#) (see above). Additionally, market participants indicated that some enterprises opted to sell their allowances and directly give up compliance due to excessive financial pressure, which increased the volume on offer and proved to be bearish.

The Beijing pilot ETS had the highest allowance price once again among the pilot ETS systems, but still fell 2% year-on-year. That said, market sentiment has remained relatively bullish as the two auctions it held were well-subscribed, showing steady demand. Shanghai's pilot ETS saw a 19% increase in allowance price, bucking the trend of generally lower prices across the pilots in 2023, which was one of the reasons that it permitted allowance exemptions for its big shortfall enterprises. As a high-emitting sector, steel companies covered by the Shanghai pilot ETS are often short the required allowances to meet emissions, forcing them to source from the open market, often at high prices, and they were reportedly a large advocate of Shanghai's policy change. Finally, prices increased

Figure 5.3: Chinese national ETS: daily traded volumes over 2023



Source: LSEG

the most on the year in the Shenzhen pilot ETS ahead of the compliance deadline, which prompted heavy trading amongst compliance enterprises. Prices across the other ETSs decreased on the year, despite compliance deadlines.

In terms of traded volume, the Fujian pilot ETS saw the most significant growth, but that growth was largely concentrated in low-priced OTC trades. Due to the limitations on price increases and decreases for ordinary OTC trades, there is an implication that some of the volume may include a significant number of buy-and-back trades, and the overall average allowance price was lower year-on-year. The biggest drop in trading volume was in the Guangdong pilot ETS, with little change in policy and prices, prompting a pullback in interest from many active investors. That said, allowance prices in Guangdong remained second only to Beijing prices.

CCER MARKET UPDATE: CCER MARKET RELAUNCHED AFTER MULTI-YEAR SUSPENSION

While the official announcement of the relaunch of China's offset-based Chinese Certified Emission Reduction (CCER) program didn't come until late January 2024, a lot of the initial steps required for the set up were rolled out across the second half of 2023, with a not insignificant impact on trading. The CCER program runs parallel to the national ETS on a largely voluntary basis to expand participation in the carbon market, but regulated entities in the national ETS are permitted to use up to 5% CCERs to meet their compliance obligation.

The CCER program was suspended seven years ago in order to rework the underlying rules and methodologies, although legacy credits were still available to be traded and retired against claims. In 2023, the government moved to relaunch the program in parallel with the run up to the start of the

Table 5.2: Chinese pilot ETSs trading summary 2023

Pilots	2023 annual			Changes 2022-2023		
	Volume (Mt)	Value (€ Million)	Average Price (€/t)	Volume	Value	Price
Guangdong	9.88	95.07	9.62	-32%	-35%	-5%
Hubei	11.74	59.74	5.09	59%	32%	-17%
Tianjin	5.75	24.18	4.20	5%	-10%	-14%
Beijing	3.68	46.44	12.63	-2%	-4%	-2%
Shanghai	2.23	19.60	8.79	-30%	-17%	19%
Chongqing	6.79	26.04	3.84	57%	21%	-23%
Shenzhen	3.85	29.44	7.65	-27%	-10%	23%
Fujian	23.95	77.91	3.25	213%	198%	-5%
Total	67.87	378.43	5.58	32%	2%	-22%

Note: Volume includes both exchange-traded and OTC transactions.

Table 5.3: Traded Volumes and Prices of Regional Offsets in

Offset Mechanism	Issued Province/ City	Traded Volume (Tonne)	Price Range (€/t)	Allowed for Compliance
FCER (林业碳汇)	Beijing	609	8.94 - 10.72 €/t	Yes
PCER (绿色出行减排量)	Beijing	101,601	7.31 - 16.95 €/t	Yes
FFCER	Fujian	Not disclosed	Not disclosed	Yes
PHCER	Guangdong	156,274	2.33 - 8.37 €/t	Yes
STCER	Guangdong	0	Not disclosed	No
CQCER	Chongqing	751,345	2.90 - 5.63 €/t	Yes

third compliance period in 2024. In October, [several important documents](#) were released to govern the revamped program, as well as four [new methodology](#) documents covering forestation, mangrove vegetation creation, solar thermal power and offshore wind power. The new CCER registry will be run by the National Centre of Climate Change Strategy and International Cooperation (NCSC), with the Beijing Green Exchange (BGE) operating the trading and settlement platform. Following [several other document releases](#), all of the foundational documents were available for the official relaunch by the end of December.

The relaunch had a profound impact on CCER trading in China after several years of muted activity. In October, the MEE [notified](#) the market that CCER credits issued before 2017 will not be eligible for use in the National ETS from 1 January 2025. This change in policy prompted a surge in demand for CCER credits as many buyers looked to clear older credits for use during the second compliance cycle; legacy CCER credits may still be used for compliance in the pilot ETS programs or as part of voluntary carbon neutrality claims.

15 million tonnes of CCERs were traded over the course of the year – most of them in the second half of 2023, following the MEE's announcement about legacy credits – up about 78% from 2022. Because much of this demand was tied towards the 5% compliance use case, CCER prices largely shadowed CEA prices throughout the second half of the year, although they traded in a wide range depending on project type, ranging from a low of virtually CNY 0 to CNY 300 (approx. €40).

No new CCERs were issued in 2023, and as of this writing, the national authority has not yet accredited a third-party verifier; this is likely to change in the first quarter of 2024. According to the latest notice released by the National Certification and Accreditation Administration (CNCA), eligible projects with start dates not earlier than 8 November 2012

will be able to apply for emission reduction credits generated from 22 September 2020.

SOME REGIONAL OFFSET MARKETS RESUME ISSUANCES

In 2023, the traded volume of two local offsets in the Beijing pilot ETS – FCER (Forestry Carbon Sequestration) and PCER (Beijing Parking Certified Emission Reduction) – rose relative to the previous year, although spot trading remained limited due to low supply, which meant that prices stayed relatively high. Beijing allows some use of offsets against compliance claims in the ETS, and Beijing's high allowance price means that the limited number of available offsets also traded at higher prices. FFCER (Fujian Forestry Certified Emission Reductions) offsets in the Fujian pilot ETS did not publish transaction information for 2023. Guangdong's PHCER (Puhui Certified Emission Reduction) offsets saw prices increase in 2023 after a weak 2022, primarily due to the restart of issuances in the primary market, but overall traded volume remained well below the volume traded in 2021. The Chongqing pilot ETS saw significant trading in 2023 after the authorities revised and issued a number of new methodologies for its CQCER (Chongqing Certified Emission Reduction) offset, opening up their use for compliance. However, [applications for projects and issuances](#) of CQCER have subsequently been suspended in order to clarify the development process of new projects and further develop the revenue sharing mechanism from sales; this suspension prompted the primary market to stagnate later in the year.

OUTLOOK FOR 2024: TRADING SET TO SLOW DURING NON-COMPLIANCE YEAR

In the two years following the launch of China's national Emissions Trading System, the market has become more mature, which has led to more transparency and better price discovery. Based on the emission and allowance supply projections, we have utilized the updated Chinese national ETS pricing model to project allowance prices. China has recently added annual vintage labels for allowances distributed across different compliance periods, although the exact impact of this policy on compliance claims remains unclear. In the model, and in the absence of more detailed information, we have maintained our assumption that all allowances can be stored and are valid indefinitely. Moreover, we also anticipate that China will not change its two-year compliance period ahead of the third compliance deadline in 2025. As 2024 falls within the middle of the compliance cycle, there will be very limited – if any – momentum for significant price fluctuations or significant trading activity. Using LSEG's in-house China ETS carbon pricing model, we conclude that the CEA price will likely remain at CNY 70/t (approx. €9) throughout 2024.

At present, China's national ETS only includes the electricity sector. Nonetheless, with the resurgence of the voluntary carbon market (CCERs) and the growing prominence of Green Electricity Certificates and green power trading, the synergy between electricity and carbon has become increasingly important. As China continues to both grow its renewable fleet and reform its power sector, a breakthrough in the collaborative mechanism between carbon and electricity is needed to mitigate the risk of double-counting and bolster renewable energy consumption, thereby contributing to China's climate pledges.

In the pilot carbon market regions, such as Beijing, Tianjin, Shanghai and Hubei, the use of green electricity (either in terms of green power generation or directly using green certificates, such as in Tianjin) is allowed and can offset corresponding emissions. The experiences gained from these pilot programs will provide valuable insights and references for future developments.

At the outset of 2024, the reboot of China's CCER not only promotes the complementary connection between the mandatory and voluntary carbon market but also, to some extent, revitalizes the global voluntary carbon market (VCM), particularly in the face of an embattled international VCM throughout 2023. The restart of the CCER market will also impact supply and demand within the national ETS as new CCERs are issued, likely increasing their use for compliance claims, which could have a bearish impact on CEA prices.

Apart from the electricity sector, expanding the carbon market will be a major highlight of China's national ETS in 2024. Over the past year, carbon regulators and research think tanks have conducted multiple rounds of discussions on expansion. Taking into account policy trends, the weight of carbon emissions in various industries, data quality, and accounting methodologies, in the coming year, the cement and electrolytic aluminium sectors are likely to be incorporated in the national ETS, with iron and steel and aviation possibly following.

The pilot carbon markets are expected to continue operating, although the possible expansion of the National ETS to other industries in the next compliance period is likely to reduce the number of participating enterprises and the scale of emissions covered by the pilot ETS programs. The new allocation plans of some pilot ETSs have already made advanced statements about this situation. The Guangdong pilot ETS, for example, stated in its 2023 allocation plan that if an enterprise is included in the national ETS, it will no longer be covered by the Guangdong pilot ETS, and will recover its pre-issued allowances for 2023. This is likely to keep prices neutral throughout 2024.

By the end of 2023, entities in the cement industry had already carried out simulated carbon market trading, lasting for six months. This is similar to China's electricity spot market, which also underwent a simulated trial operation in its initial stage, showcasing characteristics of China's incremental

reform—"crossing the river by feeling the stones," experimenting and making progress step by step. This approach takes into account not only the burden on industrial enterprises but also their adaptation to the carbon market.

During the initial and subsequent compliance periods, carbon allowances in China's carbon market were allocated free of charge, without the implementation of the auction mechanism. Taking inspiration from China's local pilot carbon markets and international carbon market practices, China's national ETS is likely to introduce an auction mechanism for the power sector. Initially, the auction percentage is projected to be under single digit percent, with a gradual increase in the auction proportion in subsequent periods. This is similar to the initial stages of the EU ETS.

The national ETS is set to undergo further regulatory improvements following the approval and issuance of the 'Interim Regulations on the Administration of Carbon Emission Trading', published on 4 February, which had sat on the legislative agenda for three years in a row. These updated regulations are set to govern the terms of the National ETS and are due to come into effect from 1 May 2024. Updating these regulatory rules was a critical step in creating a more robust legal framework for the ETS as it prepares to expand into new sectors. The implementation of these measures and new top-level design policy will lead to enhanced data quality, increased deterrence against data falsification, and thus promote transparency in the national carbon market.

6. South Korea

KETS prices continued to fall in 2023. The market is currently in Phase 3 (2021-2025) and allowance prices remain low as a result of a persistent overhang of them and slower economic growth, although traded volumes were more than double what they were in 2022. South Korea's announcement of more ambitious climate change mitigation targets sent a positive signal to market participants, but it remains to be seen whether KETS-related policies can be changed accordingly, and to what extent they will be adjusted

MARKET & POLICY DEVELOPMENTS: TRADING UP, BUT PRICES DOWN

In 2023, 89 million Korean Allowance Units (KAUs) and Korean offset credits (KOCs) changed hands in the Korean Emission Trading System (KETS), up 128% from 2022. The total Korean market value was 3% higher than in 2022 at KRW 904 billion (approx. €638 million), but none of the 12 auctions held in 2023 were fully subscribed, meaning that not all allowances on offer were sold. Over the course of the year, a total of 7 million KAUs were purchased at auction versus 14 million bought by auction in 2022. Because of sharp price declines, KETS set a temporary price floor twice to stabilize the market, but sentiment remained bearish. The increase in overall traded volume was due entirely to a sharp increase in the number of transactions of standardized exchange traded contracts, which rose by a factor of 2.7 in 2023. The share of both auctions and OTC trades declined significantly year-on-year, which could be seen as a sign of a maturing market overall.

Allowance prices continued to decrease over the first eight months of the year, with the low price in July hitting the temporary price floor before sinking lower in August. In September, the [South Korean government](#)

Figure 6.1: KAU monthly closing prices in 2023



Source: KRX

[moved](#) to revitalize KETS by adjusting the KAU carry-over rules, but after a short-lived increase, prices fell back again as the overall surplus of allowances remained high. In November, allowance prices fell to another low, and the market once again resorted to a temporary price floor. The [KETS allowance allocation plan](#) was formally revised in December, with the government allocating a total of 3.04 billion Korean Allowance Units (KAUs) to compliance enterprises, in addition to market stabilization reserves (14 million KAUs) and liquidity management measures (20 million KAUs). In addition, in order to improve market liquidity, [KETS introduced more market makers](#), with eight finalized market makers for 2024.

Although South Korea is still trying to tighten the allocation in its ETS to stabilize the price of allowances, the overall oversupply situation will almost certainly continue for some time barring significant market reform. Coupled with recent [sluggish economic growth](#), the allowance surplus in the market could rise further, dampening the slight rise in allowance prices at the end of 2023. A

significant portion of Korea's compliance enterprises, led by the power sector, is still expected to receive more allowances than they emit.

Since 2021, firms covered by the KETS may only use offsets to cover up to 5% of their compliance obligation, down from 10% in the previous phase. The offsets Korea's government considers eligible are units generated by the now-expired Kyoto Protocol's international offset mechanism (CDM, see international negotiations section of this report), but they must be "converted" to Korean Credit Units (KCUs) to be used for compliance.

Under the latest policy, the time period within which enterprises are now required to convert Korean offset credits (KOCs) into Korean credit units (KCUs) has been extended to five years, up from two years previously, which could impact the demand for allowances. In 2023, the traded volume of KCUs was stable compared to 2022.

Table 6.1: Volume and value in KETS 2020-2023

	2020		2021		2022		2023	
	Mt	€ million	Mt	€ million	Mt	€ million	Mt	€ million
KAUs exchange*	13	270	13	186	12	176	69	488
KAUs auction*	8	186	11	217	14	234	8	60
KAUs OTC**	19	342	23	312	8	114	5	35
KOCs exchange*	0.2	6	2	44	0.8	13	2	13
KOCs OTC**	4	66	2	39	5	82	6	42
Total	44	870	51	798	39	618	89	638

*Source: Korea Exchange (KRX)

**Source: Ecoeye

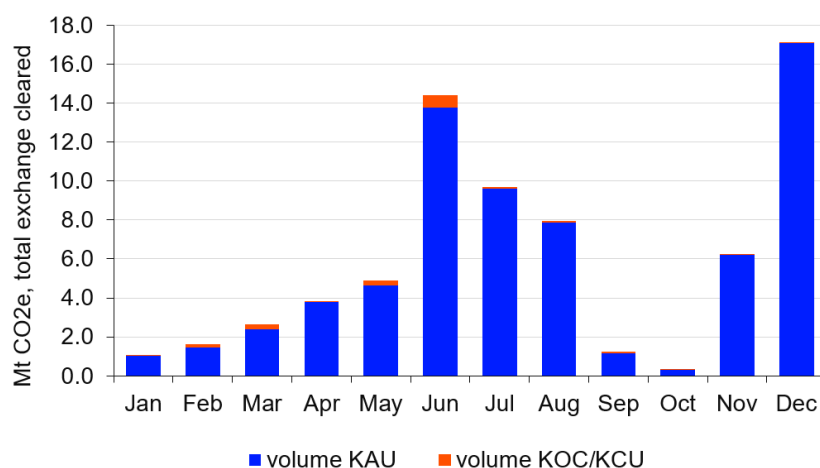
OUTLOOK FOR 2024: OVERSUPPLY TO REMAIN WITHOUT MARKET REFORM

The Korean government is trying to revitalize the persistently depressed KETS through a number of measures, but the market remains in a state of oversupply. Although the government has increased the proportion of enterprises using the benchmarking-based allocation in the third phase, there are still a significant number of enterprises getting their allowance from the grandfathering allocation mechanism. If there are no more adjustments to the allocation policy in the short term, with economic growth still sluggish, corporate emissions are also expected to be very limited, and the market will see yet another year of excess allowance allocation. This will make market participants reserved about the outlook for the market, and allowance prices may continue to sink to lower levels.

The increase in the number of market makers may boost the market's trading activity, and good liquidity will undoubtedly help enterprises to meet their compliance in the ETS or to reach a certain level of profitability through the sale of allowances.

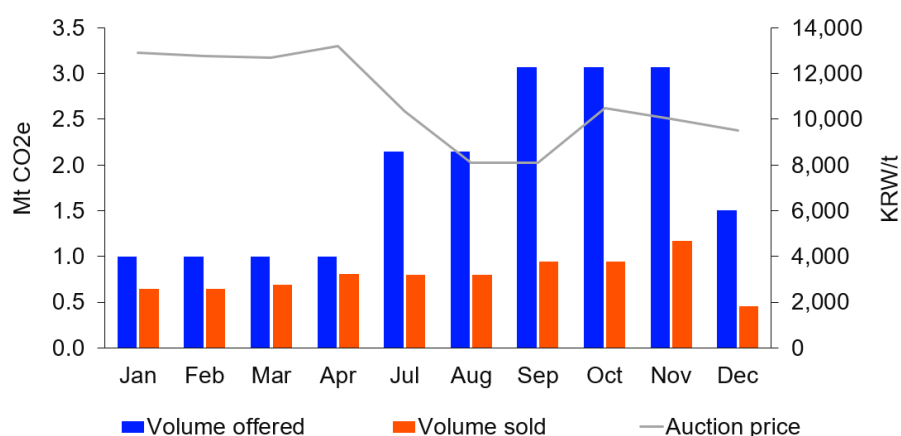
Some market participants are already curious about the market's policies for the next phase (2026-2030), and if the South Korean government can make drastic reforms for the future, demonstrating the importance it attaches to the ETS and its [strict management of emissions](#), it may be able to inject more positive sentiment into the market.

Figure 6.2: KETS traded volumes at KRX 2023



Source: KRX

Figure 6.3: KETS auctions in 2023



Source: KRX

7. New Zealand

New Zealand Unit (NZU) prices were volatile throughout 2023 amid ETS reform and a hard-fought Parliamentary campaign. The change of government in Q4 has virtually ensured that there will be no further major reforms to the ETS in the near term, which erased some uncertainty in the market and prompted a boost in prices across Q4. However, it has also resulted in several major changes to New Zealand's environmental policy which could have knock on impacts on the ETS. The market remains fundamentally over supplied and all of the 2023 NZU auctions failed – belying even the most cynical predictions – and traded volume in 2023 totaled only 17 million tonnes, down 70% from 2022.

Figure 7.1: NZU spot contract daily closing prices 2023



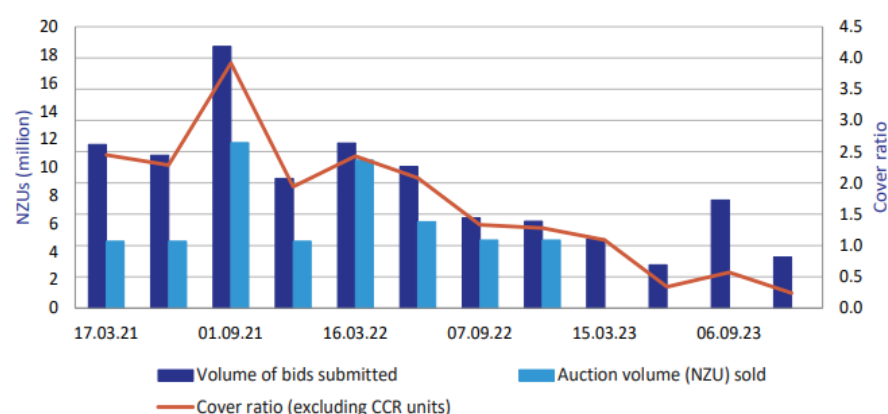
Source: Jarden Comtrade

MARKET DEVELOPMENTS: PRICES PROVE VOLATILE AMID POLICY UNCERTAINTY

NZU prices were volatile throughout 2023, following first a review by the Labour Government and then the October 2023 Parliamentary elections, where the future of New Zealand's climate legislation was a major source of debate among the country's political parties. NZUs dropped to their lowest below NZD40 mid-year, before bouncing back to around NZD70 by the end of 2023, down slightly from where they started the year in January.

The drop in price throughout the first half of the year was linked to three things: a fundamental oversupply of NZUs in the market, [controversy](#) (*subscription required*) that existing forestry methodologies favoring "exotic" tree plantations over native species, and a [set of proposed major reforms](#) (*subscription required*) to address both from the then-Labour government that would split the market by reductions and removals. In late 2022, to address the issue of oversupply, the [Climate Change Commission](#) (CCC), which oversees the NZ ETS, [proposed](#) (*subscription required*) a set of amendments to boost prices and significantly decrease the number of units available via auction.

Figure 7.2: NZ auctions historical data



Source: NZ Ministry for the Environment

Initially, these recommendations were [rejected](#) (*subscription required*) by the then-Labour Government, and the price of NZUs dropped heavily throughout the first half of the year; facing a competitive election, Labour opted to walk back its rejection and [announced](#) that it would reconsider the CCC's recommendations in order to stop the slide in prices.

In order to address other challenges, Labour proposed several other reforms to the market, including one that would [separate](#)

[reduction activities](#) (*subscription required*) and removals into separate markets. Under these changes, only reduction activities would be eligible under the NZ ETS, while removals – the largest individual source of non-auction NZUs – would be moved to a separate market with the government as the only buyer. The plan was to address the concerns about the integrity of the forestry units in the NZU market. Additionally, Labour also [proposed](#) the launch of a biodiversity market, but was rather vague about the details of how that market would work or tie into the larger ETS.

Table 7.1: NZ ETS by segment 2020-2023

	2020		2021		2022		2023	
	Mt	€ million	Mt	€ million	Mt	€ million	Mt	€ million
NZUs auctioned	n/a	n/a	26	793	26	1,218	0	0
NZUs exchange traded	30	516	55	1,712	34	1,628	17	596
Total	30	516	81	2,505	60	2,846	17	596

Labour ultimately [lost](#) the Parliamentary election to the Nationals, who had run on a campaign of no further major ETS reforms, although not before they were able to successfully push through the CCC's initial recommendations, which came into effect in December 2023. As of this writing, the National Government has stuck by its election campaign promise to not enact further reform to the market, and prices largely stabilized as the year drew to a close.

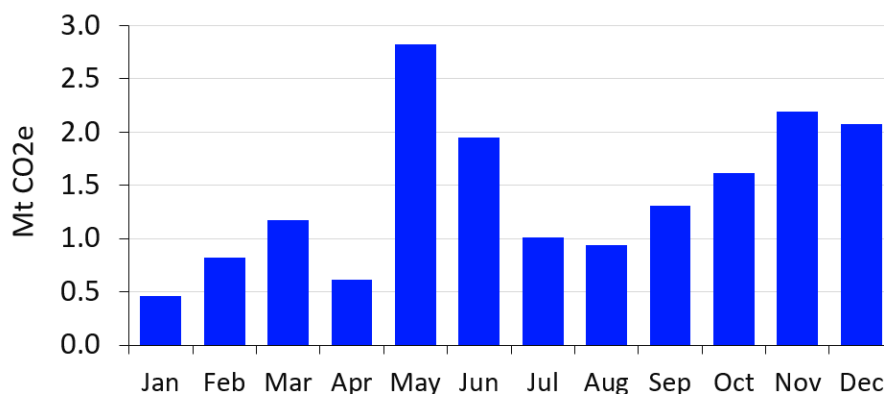
None of the four NZU auctions in 2023 – including the December one held according to the new rules (Fig. 7.2) – met the minimum auction prices and thus failed, underscoring that the market remains fundamentally oversupplied. Unlike in 2022, when auction supply was almost equal to the volume traded on the exchanges, the absence of auction trading contributed to a 70% drop off in total NZU traded volumes year-on-year to 17 Mt. Because all four of the 2023 auctions failed, the 23 Mt that would have otherwise been available through this mechanism has now been permanently removed from the market. Exchange trading in 2023 was also significantly down on 2022 (Fig. 7.3), which contributed dramatically to the overall traded volume decline in 2023.

POLICY DEVELOPMENTS: AN END TO LABOUR DOMINANCE IN NEW ZEALAND

The October parliamentary elections saw the National Party claim victory in a coalition with the right leaning NZ First and Act parties, unseating a long-running Labour majority in New Zealand. The Nationals ran on a party platform advocating a more “hands-off” approach to climate policy and, in particular, to the ETS, which they view as more of a financial instrument rather than as a tool to enact more ambitious initiatives like increased biodiversity.

As soon as it took control, the new government halted the review of the ETS but did not overturn the CCC recommendations adopted under Labour. The choice to abandon further reforms to the ETS added some stability to the market, at least for the time being. Controversially, the government also [decided](#) (*subscription required*) to leave New Zealand's large agricultural sector outside of the ETS, which will severely curtail its ambition in the near-to-medium term. Additionally, the new government also agreed to [lift the ban](#) (*subscription required*) on offshore oil and gas exploration

Figure 7.3: Transacted NZU volumes in 2023



Source: Jarden Commtrade

Our estimates are based on volumes provided by brokerage firm Jarden, which accounts for roughly half of all NZU transactions, so we assume total NZ volume at about twice the Jarden total. The chart above shows our assessment of total traded volume.

programme, which is a substantial shift in policy, and will be difficult to square with New Zealand's obligations under the Paris Agreement.

OUTLOOK FOR 2024: OVERSUPPLY TO LAST

The first auction on 2024 is scheduled for March, with only 3.5 million NZUs available initially, although that figure will increase to around 8 million if the Cost Containment Reserve (CCR) tier prices are breached – Tier 1 is NZD184 and Tier 2 is NZD230 – which is extremely unlikely. Recent amendments to the auction rules are likely to be important drivers of NZU prices over the next year, but without further changes to the ETS, that impact will be limited long-term.

New Zealand's two-tier system which sees the market supplied with both auction volumes and units generated from reduction or removal activities means that the government has only so much control over the market supply. The country's forestry sector in particular supplies large volumes of NZUs to the market – often through “exotic” tree plantations, rather than native species with high biodiversity – and is a particularly critical point to tackle.

The CCC has recently [provided](#) (*subscription required*) its first round of advice to the newly elected conservative government, indicating that the country is currently not on track to meet its 2030 climate goals, and will remain off-track without amendments to the NZ ETS. At the forefront of those recommendations is

the role of forestry in the ETS, particularly excessive planting. The CCC aims to create a different approach for gross GHG emission reductions and incentives applying to forests. What the new government does with these recommendations given the platform it ran under remains to be seen.

8. Japan

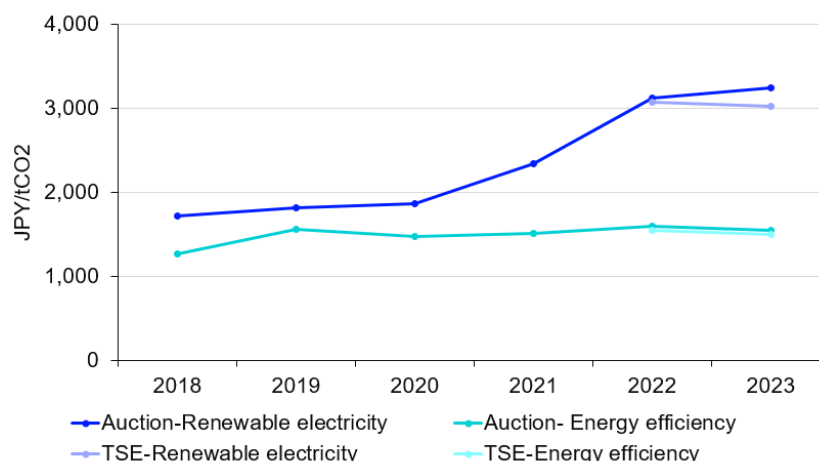
The Tokyo Stock Exchange formally introduced a carbon credit market in October 2023 following a brief pilot phase that ran from late 2022 to early 2023. The exchange market is part of the voluntary emissions trading scheme from the GX League initiative introduced in 2023. It comprises some 570 companies, including the power generation sector and large-emitting sectors such as iron & steel and chemicals, and covers approximately 40% of Japan's total carbon dioxide emissions.

MARKET & POLICY DEVELOPMENTS: A NEW VOLUNTARY EMISSIONS TRADING SCHEME

The Tokyo Stock Exchange (TSE) launched its carbon credit market on 11 October 2023, following a 4-month pilot phase that ran from 22 September 2022 to 31 January 2023. The market uses [J-Credits](#), a well-established domestic carbon offset program, which has historically been transacted via auction and over the counter. The exchange market was launched in order to boost Japan's carbon market as part of the voluntary GX League emission trading scheme (GX ETS) which was also introduced in 2023. J-Credits are one of two types of credits eligible for claims in the ETS. Around 570 companies participate in the [GX League](#), including all the major electricity generators and the bulk of the companies from the largest emitting sectors, such as iron & steel and chemicals. Together, the participating companies in the GX ETS represent approximately 40% of Japan's total CO₂ emissions.

In 2023, both the exchange-traded market and government auctions saw prices comparable to the previous year (Figure 8.1). Prices on the TSE averaged about JPY3,000/tCO₂ (approx. €20) for credits from renewable electricity, JPY1,700/tCO₂ (approx. €11) for energy efficiency projects, JPY2,300/tCO₂ (approx. €15) for renewable heat, and JPY7,700/tCO₂ (approx. €50)

Figure 8.1: J-Credit price by type, annual average



Source: LSEG Workspace, Japan Exchange Group, J-Credit website

Note: The 2022 price for TSE-renewable electricity includes credits from solar PV projects only due to the change in product classification.

for forest sink. At the government auction in May, the average price was about JPY3,200/tCO₂ (approx. €21) for renewable electricity and about 1,600/tCO₂ (approx. €10) for energy efficiency. [Eligibility for other schemes](#) was also a significant price driver for J-Credits in 2023; half of the J-Credits that have been retired since the program launch in 2008 have been used by electricity utilities adjusting their emission intensity under Japan's mandatory reporting system. Companies can also use renewable electricity J-Credits for targets under [RE100](#) and the [CDP](#) questionnaire. Companies can also count J-Credits from energy efficiency projects as energy efficiency projects under the Energy Efficiency Act.

Traded volumes in 2023 were 20% lower than in 2022 after auction sales volumes nearly halved. 91,000 tCO₂ changed hands on the TSE over 2.5 months from the market launch to the end of the year, 104,000 tCO₂ during the pilot phase, and 300,000 tCO₂ via the sole government auction of the year

in May 2023. Two credit types, renewable electricity and energy efficiency, were dominant, accounting for all the volumes transacted apart from a mere 150 tCO₂ of renewable heat credits and 130 tCO₂ of forest credits transacted on the TSE. The average daily transaction volumes on the TSE more than quadrupled to nearly 3,000 tCO₂ after the TSE implemented a market maker system on 27 November in which designated market makers facilitated sales of government-owned credits from energy efficiency and renewable electricity projects. While the system did help boost liquidity, the exchange-traded volumes on an annualized basis still represent a mere 0.1% of the annual CO₂ emissions of the participating GX ETS companies.

Table 8.1: J-Credit trading in 2023, on the exchange and auctions

	Volume kt-CO ₂	Value JPY mn	Value € mn*
J-Credits exchange traded (11 Oct 2023- 28 Dec 2023)	91	226	1.5
Pilot: J-Credits exchange traded (Sep 2022- Jan 2023)	149	325	2.1
J-Credits auctioned (May 2023)	301	907	5.9

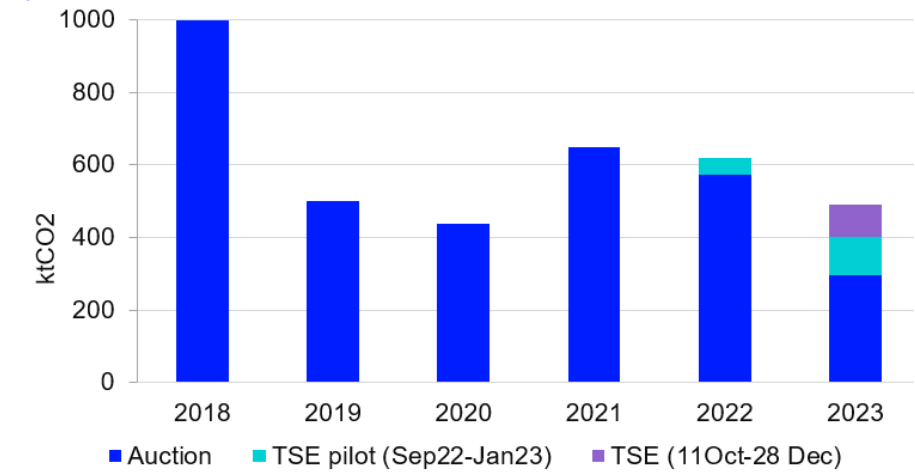
Note: Information on J-Credits traded OTC is unavailable. *Converted at €1=JPY155

Sources: Japan Exchange Group, J-Credit website

OUTLOOK FOR 2024: FIRST FULL YEAR OF OPERATION

Looking ahead, we anticipate a slight increase in liquidity, with enhanced visibility of carbon credit demand as the GX ETS companies disclose their emission reduction targets and the scale of the potential need for credits becomes clearer. On the supply side, government sales will continue to support transactions. Trade volumes on the TSE could reach a couple of hundred thousand tons in early 2024, given that the exchange plans to keep the market maker system in place until the end of February 2024. Moreover, the TSE plans to start trading additional credits from overseas projects under the Joint Crediting Mechanism (JCM) (the other type of eligible for offsetting in the GX ETS), and has plans to introduce excess reduction quotas to its exchange offerings later in 2024, which could add some liquidity to the market.

Figure 8.2: J-Credit traded volumes



Source: LSEG Workspace, Japan Exchange Group, J-Credit website

9. International aviation

International aviation emissions have been increasing amid a return to “normal” following the COVID pandemic, meaning there might be more demand from operators during Phase 1 of the International Civil Aviation Organization’s (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (2024-2026) than there was in the pilot phase. As of current writing, only two Standards have been approved by the ICAO Council as eligible for CORSIA Phase 1, although more are expected, which leaves some question of what the actual supply of eligible credits will look like. CORSIA Phase 1 credits are required to align with the Paris Agreement Article 6 rules and include corresponding adjustments (CAs), which has given them an additional stamp of credibility with some buyers and has led to them being included in the criteria for some exchange-listed standardized contracts. It is likely that airlines looking to meet CORSIA obligations will be in competition for eligible credits with voluntary carbon market (VCM) buyers.

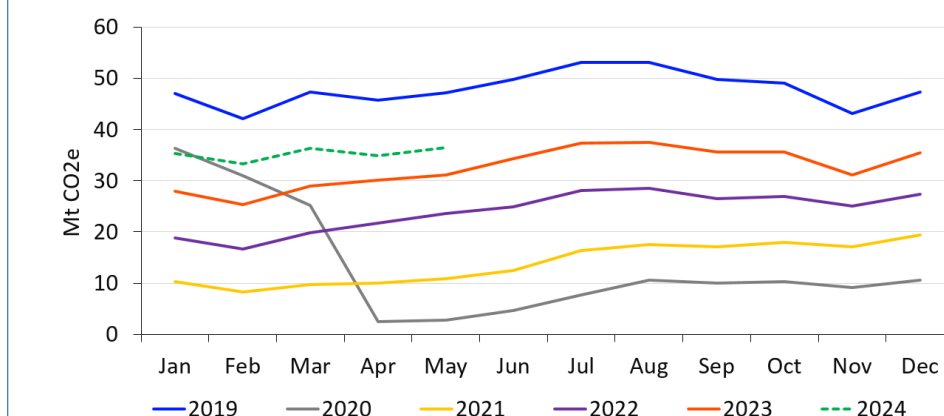
MARKET AND POLICY DEVELOPMENTS: AVIATION EMISSIONS APPROACHING PRE-PANDEMIC LEVELS

According to RDC Aviation data, total annual international aviation emissions have increased by 35% in 2023 when compared to 2022 to almost 400 million tonnes (Mt), which is still below the 575 Mt seen in 2019 pre-pandemic.

According to data from the International Air Transport Association (IATA), airlines are expected to carry a record [4.7 billion](#) passengers in 2024, which should lead to a further increase in emissions in 2024. ICAO seeks to cap emissions from international aviation at 85% of 2019 levels under CORSIA Phase 1 (2024-2026). Given IATA’s data on the current traffic recovery and the current non-viability of sustainable aviation fuels (SAFs) at sufficient scale, that threshold should be breached sometime in 2024, meaning that offsetting will become a part of the industry in a way it was not during the scheme’s initial pilot phase. During the Pilot Phase (2021-2023), emissions were below the 85% threshold, meaning that any aviation offsetting was outside of CORSIA.

As of January 2024, [126 states](#) have opted into the CORSIA voluntary phases (the Pilot Phase and Phase 1). However, the exact volumes to be covered by offsets in Phase 1 will be calculated in 2026 and will depend on airline traffic and the use of non-market measures to reduce emissions like SAFs. SAFs are not available in sufficient volumes currently to be widely

Figure 9.1: Monthly international aviation emissions (Historical for 2019-2023 and projections for 2024)



Source: RDC

used by airlines to manage emissions, and they are significantly more expensive than offsets, making offsets the likely first stop for airlines looking to meet CORSIA compliance. Airlines have until January 31, 2025 to meet obligations under the Pilot Phase and until January 31, 2028 to meet obligations under Phase 1, meaning it is unlikely that there will be a rush for credits in 2024.

The volume of credits available for inclusion under Phase 1 is not clear, as only two voluntary carbon market standards are currently approved for Phase 1 participation. According to ICAO procedure, each standard can apply for CORSIA eligibility, but each Phase has eligibility approved separately. This means that the [eleven](#) Standards eligible for the Pilot Phase need to reapply for approval under subsequent phases.

The ICAO Technical Body (TAB) is responsible for approval/non-approval of applicants. Seven standards applied for participation in 2022, but under TAB’s recommendations, the ICAO Council only [cleared two](#) of them for Phase 1 in March 2023: the Architecture for REDD+ Transactions and American Carbon Registry (ACR). Verra and Gold Standard (GS), the two largest voluntary market Standards were only provided with conditional approval, while those that were not approved were provided a list of recommended changes to align with ICAO principles, particularly around necessary measures to prevent double claiming of emissions reductions. There will likely be more visibility on the fate of Verra and GS’s approval later in Q1 2024.

OUTLOOK FOR 2024: PHASE 1 LIKELY MORE ACTIVE THAN PILOT PHASE

CORSIA has already had an impact on the market that has not been limited to International Aviation. While 2024 will mark the first time the rules are likely to bite for International Aviation, the CORSIA “stamp” has already been serving as a mark of credit quality, particularly in the absence of agreed rules for Article 6.4. Indeed, without an agreement, CORSIA is one of the few ways to ensure that a buyer – either a non-airline private entity, or a country looking to meet its Nationally-determined contribution – is getting a correspondingly-adjusted credit. This is likely to prompt an increase in demand for CORSIA-eligible credits and boost market prices for them, given the limited supply. The Intercontinental Exchange (ICE) launched its first CORSIA Phase 1 standardized contract, which is priced as of writing at around \$10/t, well above the \$0.60/t for Pilot Phase non-adjusted credits at the CME.

The ICAO Council is expected to grant approval to more standards in 2024, including Verra and GS, and it is possible that more Standards will apply for inclusion in CORSIA in 2024. According to a report [published](#) in Carbon Pulse (*subscription required*) CORSIA Phase 1 demand is expected to be between 130 and 160 Mt, with firmer demand not expected ahead of the mandatory Phase 2 beginning in 2027. But market players are already worried about the imbalance, as uncertainty over credit eligibility and criticism about project integrity is deterring investment into carbon projects which will have a direct impact on future supply. Availability of any credits with corresponding adjustments (including CORSIA-eligible) could face hurdles from host countries looking to keep the credits for use towards their own NDC targets.

10. Voluntary Carbon Market

2023 was a bearish year for voluntary carbon market prices, even as retirements hit their highest ever levels following a wave in December. Questions arose regarding the integrity and credibility of offsetting, with particular scrutiny on the carbon avoidance calculations of nature-based REDD+ projects. Despite COP28 failing to produce final decisions on the rules of Article 6 – either 6.2 or 6.4 – the voluntary carbon market is continuing to pursue Article 6-aligned best practice guidelines, as well as the long-awaited CCP labels from the IC VCM initiative.

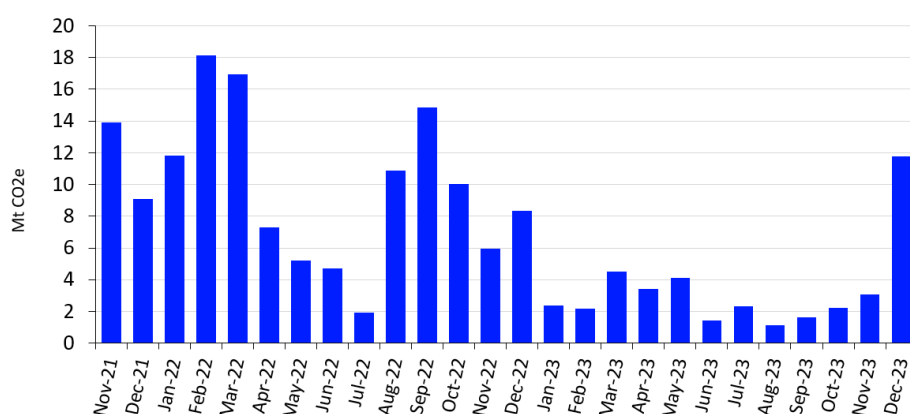
MARKET DEVELOPMENTS: PRICES DROP SHARPLY ACROSS ALL PROJECT TYPES

The below estimates of secondary market activity in the Voluntary Carbon Market are drawn from the volumes and prices supplied by Xpansiv CBL exchange, where as much as [one-third](#) of the market volume was traded in 2021. However, that may no longer be the case — there was a 65% decrease in exchange spot volume traded in 2023 when compared to 2022, with only 40 million credits changing hands on CBL over the course of the year, the bulk of which was traded in December (Fig. 10.1).

Out of the total spot volumes, CORSIA-eligible GEO contracts were responsible for the largest overall traded share at 30% (Fig. 10.2). There was a significant increase in trading activity on GEO in December 2023, with almost 7 million tonnes traded, the highest single monthly volume since September 2022. Non-standardized contracts, which were responsible for the largest share of volumes traded on the exchange in 2022 at 65%, only accounted for 27% of the total traded volume in 2023. Nature-based N-GEO contracts accounted for 24% of the total volume traded on the exchange in 2023, totaling almost 10 million tonnes. The exchange's other standardized contracts accounted for the balance at smaller volumes.

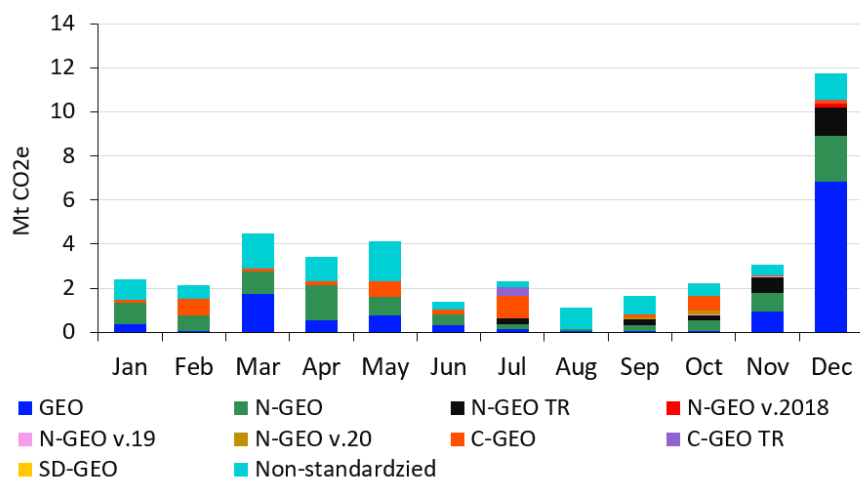
The VCM faced heavy criticism throughout 2023, which had a dramatic impact on prices both on the exchanges and in the over-the-counter market (Fig. 10.3). End-year prices for all the standardized contracts were sharply down on where they started the year. Nature-based N-GEO and N-GEO TR shed the most value over the course of the year, dropping more than 90% when compared to December 2022. GEO, CCP-eligible C-GEO

Figure 10.1: Xpansiv CBL carbon emissions offset spot monthly volumes



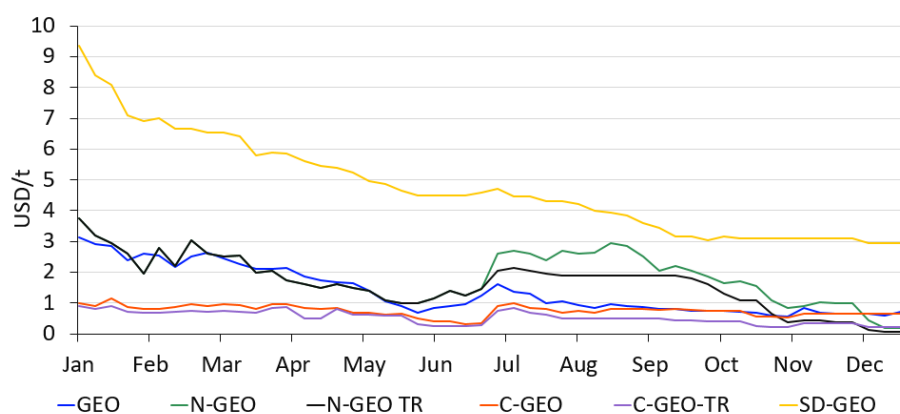
Source: CBL Markets

Figure 10.2: Xpansiv CBL carbon emissions offset spot monthly volumes by contract



Source: CBL Markets

Figure 10.3: Xpansiv CBL carbon emissions offset spot close prices



Source: CBL Markets

and Cookstoves SD-GEO dropped between 50% and 80% throughout the year, with C-GEO proving the most resilient, although it started the year much lower than the others, meaning it had the least room to fall. Almost all of the standardized contracts ended the year below \$1/t, with N-GEO and N-GEO TR dropping the most in terms of outright value over the course of the year.

Unlike exchange-based spot trading, which fell in 2023, exchange-traded volume in the futures market actually increased, with CME CBL volume up almost 10% from 2022 (Fig. 10.4) at nearly 230 million tonnes. Over half of the traded volume in 2022 was on GEO, while N-GEO trading accounted for 36% of total activity. C-GEO only accounted for 12% of the volume traded on the CME exchange in 2023.

CME futures prices followed the 2023 trend and dropped sharply (Fig. 10.5), with N-GEO falling more than 95% over the course of 2023. GEO futures fell around 80% throughout 2023, while C-GEO slid by 40%. There were no trades for N-GEO TR and C-GEO TR futures in 2023.

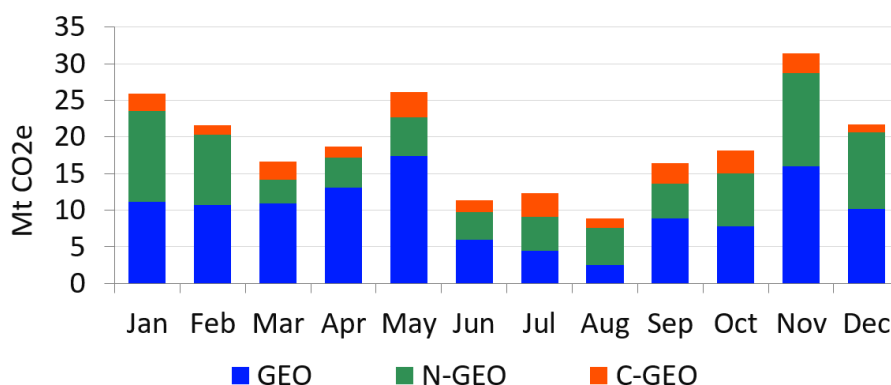
OTC prices were less turbulent than the standardized contracts (Table 10.1), largely because they are traded on a project-by-project basis, which insulated some projects from the controversy, even as other projects saw demand evaporate completely. This approach creates broader price differentiation, with older vintages and higher volumes typically pricing at lower prices, while newer vintages and smaller volumes are priced higher, although this is not always the case, depending on the individual credit.

Project type is one of the key attributes that determines the price of the credit. Non-REDD forestry credits were offered at almost \$14/t, with cookstoves credits offered at around \$8/t, and REDD credits offered at \$6/t. Renewable energy projects, including hydropower, wind, solar and biomass ranged between \$1.50/t and \$3/t, while landfill and clean water projects were offered slightly higher at \$5/t. Generally, however, all project types fell throughout the year, although less dramatically than the exchange-based standardized contracts, sliding by about 20-30% since the start of the year.

VCM REMAINS CONTROVERSIAL AMID INTEGRITY CONCERNS

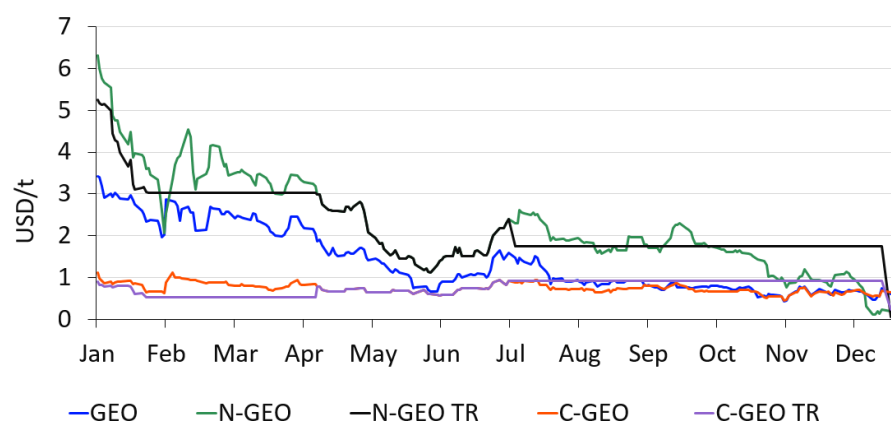
While there was already evidence that some of the heat was coming out of the voluntary carbon market in late 2022, the

Figure 10.4: CME group monthly traded CBL carbon emission offset futures volumes



Source: CME Group

Figure 10.5: CME group CBL carbon emission offset futures close prices (Dec-23)



Source: CME Group

[Guardian newspaper](#) published an article in mid-January that kicked off a fresh wave of criticism of the climate impacts and potential over-crediting of carbon projects, particularly nature-based projects. While the criticism was heavily targeted at Verra, the largest project Standard, the impact was felt throughout the VCM across numerous different project types. The largest casualty of the increased scrutiny and criticism was South Pole's Kariba project, which was heavily [criticized](#) for human rights reasons, ultimately prompting South Pole to [withdraw](#) from it late in the year.

The focus on nature-based projects prompted many buyers to double-down on their project-by-project purchasing decisions, meaning that the price impact hit some projects harder than others. While concerns about over-crediting has long been a challenge in credit-based markets, the criticisms highlighted by the Guardian and the wave of follow-up articles focused on questions about the underlying methodology

of baselines, and how effective they were at measuring avoided deforestation. While Verra had already indicated that they were planning to review their crediting methodology, they introduced a [new consolidated REDD+ methodology](#) ahead of COP28 which aims to simplify the process and address some of the recent criticisms that have been levied at the market.

However, the VCM has already been actively engaged in ways to manage the larger criticisms about the integrity of both the underlying projects, as well as the claims made by companies around claims. The Integrity Council for the Voluntary Carbon Market (IC VCM) released the details of its long-awaited [Core Carbon Principles \(CCP\)](#) in 2023, with the first CCP aligned projects [expected in 2024](#). The hope is that CCPs will act as a quality metric, reassuring buyers and consumers alike that the credits being retired to meet climate claims are from projects with real climate impact. On the demand side, the new [Claims Code of](#)

[Practice](#) has been published by the Voluntary Carbon Markets Integrity Initiative (VCMI) to address the integrity of the claims rather than the integrity of the credits themselves. The Code establishes grades of environmental responsibility for VCM buyers depending on the share of non-abated emissions outside of the value chain covered by high quality offsets. For more information on these initiatives, please see our [analysis](#).

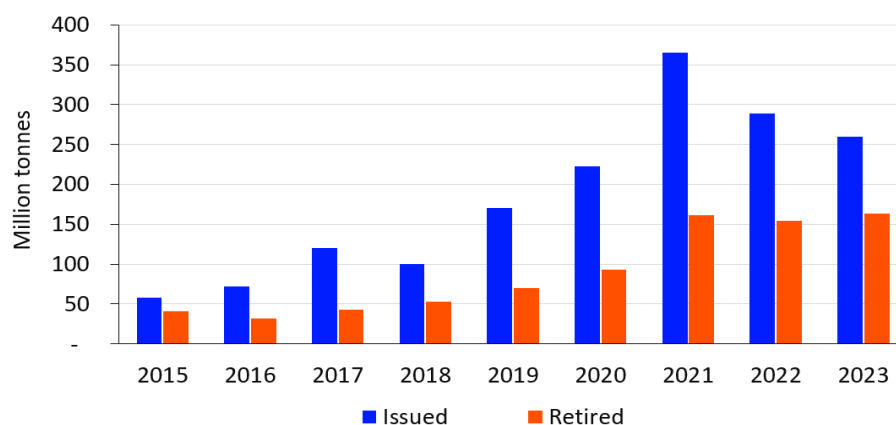
Both the CCPs and the Claims Code of Practice are voluntary initiatives in a voluntary market, but the goal is for them to be broadly adopted as a baseline “standard” that the market coalesces around in order to ensure quality and bolster confidence; without that confidence the market will continue to struggle to scale. The Xpansiv C-GEO contract currently reflects an earlier version of CCP principles, with potential further alignment with the principles as they continue to update. The largest project Standards have indicated that they intend to reflect the CCPs in their project methodologies to ensure credits are of high quality. Both the CCPs and the Claims Code are generally stricter than current standard

Table 10.1: OTC prices (bids and offers)

This table represents aggregated information based on bid and offer data supplied by Cadogan Commodities, Eagle Commodities and SSY Futures.

	Up to 50kt	50-200kt	200-500kt	Over 500kt	Total aver.
2015 and earlier	4.16	3.25	1.90	NA	3.78
Biomass	0.85		1.90		1.38
Forestry w/o REDD	8.75				8.75
Hydropower	1.60				1.60
Industrial Process		1.75			1.75
Landfill	3.50				3.50
REDD	1.75	4.00			2.65
2016 - 2020	4.71	5.65	7.00	3.43	5.22
Cookstoves	4.38	8.50			6.03
Forestry w/o REDD	13.02	14.50			13.44
Hydropower	1.27	2.45			1.79
Industrial Process	3.05	1.28		2.45	2.01
Landfill	6.50				6.50
REDD	4.39	6.97	8.19	4.40	6.56
Reducing Gas Leakage	2.60				2.60
Safe Water	5.25				5.25
Solar Power	5.43		2.25		4.37
Wind Power	3.15	2.39			2.90
2021 and later	5.67	3.45	10.50	13.83	5.35
Cookstoves	11.21	6.63			9.68
Forestry w/o REDD	21.50			23.25	22.38
Hydropower	1.59	0.93			1.31
Industrial Process	3.15				3.15
REDD		6.13	10.50	4.40	7.13
Solar Power	1.08	0.90			1.04
Wind Power	4.63	2.42			3.40
Total aver.	4.94	4.78	7.24	8.63	5.13

Figure 10.6: Credit issuances and retirements (tonnes CO₂e)



Source: LSEG Database

practice, which could create a clear striation in the market between those projects that meet the threshold and have the label and those projects that do not.

Additionally, [the failure of the Article 6 negotiations](#) (subscription required) at COP28 in Dubai in 2023 has put more impetus on the quality initiatives in the VCM. For more background on Article 6 and COP, please see the section “International

Negotiations”. Most carbon Standards have indicated that they would align with the rules of Article 6.4; under current CCPs rules, alignment with Article 6 is voluntary, rather than a requirement. The failure to agree on the rules at COP means that carbon crediting under the Article 6.4 mechanism is now not expected any earlier than 2026, which has left the UN-regulated market in limbo. That said, many participants in the VCM are still planning to align their portfolios with the

eventual rules of Article 6, which will involve securing host country approval for projects and the use of corresponding adjustments. Voluntary Standards have already worked with several host countries to create the first Article 6.4-compliant cookstoves projects, which will ensure that for every credit sold in the voluntary market, the country will perform a corresponding adjustment; initial price indications from these projects imply that Article 6-compliant credits will carry a premium to non-correspondingly adjusted credits.

A DROP IN CREDIT ISSUANCES, BUT RECORD RETIREMENTS

Credit issuances are a key indicator of market supply, while retirements are a key indicator of demand. Despite the consistent controversy surrounding the VCM in 2023, retirements hit a new record high with an annual increase of 6% in credit retirements versus 2022 (data from Verra, GS, CAR and ACR registries, responsible for 80% of the VCM credit volume). December 2023 saw a particularly dramatic wave of credit retirements in line with increased trading activity (see above) and ahead of end-of-year carbon claims.

Despite the negative media attention in 2023, REDD+ credits saw the highest overall volume of both issuances and retirements, reflecting ongoing demand for nature-based credits among buyers, although this was likely also the result of some portfolio rebalancing (Fig. 10.7). Credits from cookstoves projects, which have been also been criticized for over crediting, saw a surge in issuances in 2023, becoming the second-largest generator of credits among

project types in 2023; a number of new cookstoves projects came online in 2022, making them eligible to begin issuing credits in 2023. Wind and solar renewable energy projects were overtaken by REDD+ as the largest single generator of credits in 2023 and remained among the top types of retired projects.

OUTLOOK FOR 2024: INTEGRITY CONCERNS, PRICE STRIATION KEEP MARKET FROM SCALING

Despite challenges to the VCM in 2023, the market remained robust in both issuances and retirements, demonstrating that demand for the VCM is generally growing, albeit perhaps not at the pace many anticipated even a few years ago. The various voluntary initiatives to boost market integrity have been initially well-received by the market and could serve to boost both confidence in offsetting, as well as credit prices. That said, concerns about credit quality will remain the key challenge in the voluntary market and will continue to shape the market in 2024. Adherence to Article 6 and/or CCP eligibility is already being viewed as a metric of credit “quality”, but it waits to be seen whether or not this trend will continue. The CORSIA label, which requires alignment with Article 6, could also take on this role in the VCM, despite its use for airline compliance. For more information, please see “International Aviation”.

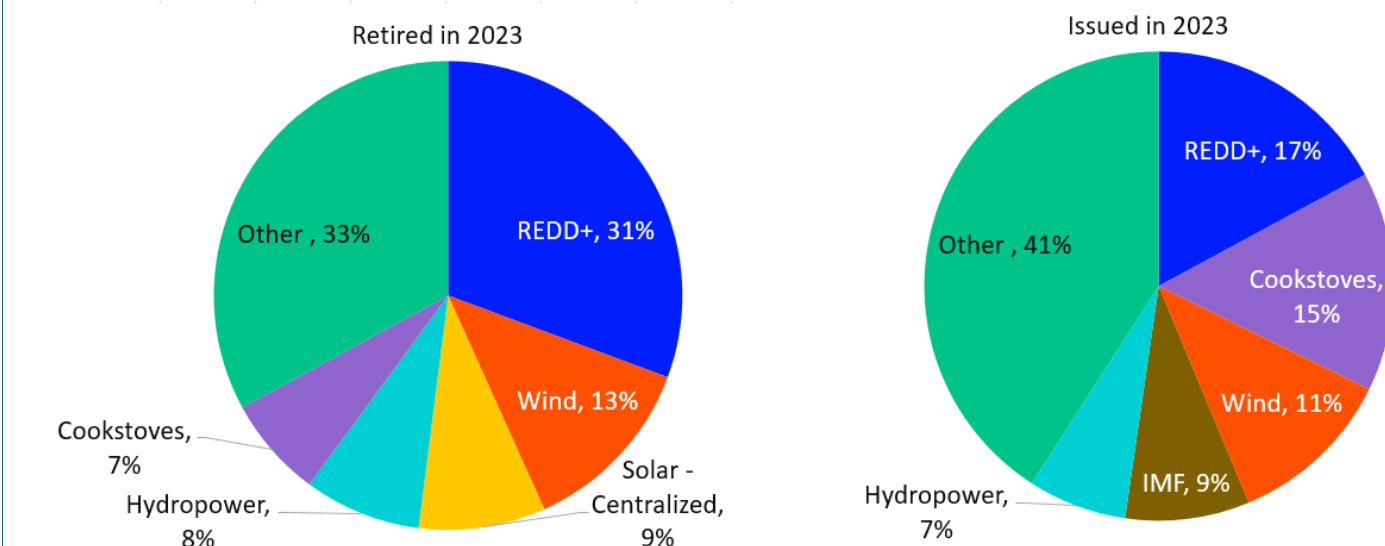
There is an increased tendency among some VCM buyers to build portfolios that correspond to Article 6 to manage the risk of possible double-counting. However, because the rules have not been finalized, and the introduction and labelling of these

Textbox 10.1: Exchange-traded voluntary offset contracts, descriptions

- GEO – Global Emission Offset, CORSIA-eligible contract
- N-GEO - Nature-Based Global Emissions Offset
- N-GEO TR - trailing contract comprising old vintages converted from N-GEO on annual basis
- C-GEO - Core Global Emissions Offset, contract based on Core Carbon Principles
- C-GEO TR – trailing contract comprising old vintages converted from C-GEO on annual basis
- SD-GEO – allows for delivery of cookstove projects with at least five Sustainable Development Goals from the Verra or Gold Standard registries

types of credits has been slow to materialize, the supply of these sorts of credits is likely to remain extremely limited in the near term due to both strict eligibility requirements and the challenges faced by many host countries to establish the necessary infrastructure to sign off on them. This may very well result in heavy competition for carbon credits that have quality labels and corresponding adjustments attached to them, while demand for credits that lack these guarantees wanes, creating a clear two-tiered market.

Figure 10.7: Issuances and retirements by project type, 2023 (tonnes CO₂e)



Source: LSEG Database

11. International Negotiations

The lead up to COP28 in Dubai was marked by an increase in the number of bilateral deals between countries looking to buy or sell carbon units to meet both their Nationally Determined Contributions (NDCs) and broader emissions reductions targets. While COP ended without formal agreement on the terms of either Article 6.2 or 6.4, bilateral agreements between nation-state counterparties are likely to continue in the interim, although these agreements have not yet been recognized as formal Article 6.2-style agreements. The failure to agree to terms on Article 6.4 is likely to further delay the establishment of the Article 6.4ER credit market until 2025 at the earliest – nearly a full decade on from the Paris Climate agreement – and has put additional pressure on the voluntary market to pick up the slack. Negotiations around the Global Stocktake (GST) were more successful, with Parties formally agreeing to “transition away” from fossil fuels for the first time, though the final agreement lacked the stronger “phase out” language and failed to set formal deadlines. 2024’s COP is set to be held in Baku, Azerbaijan, which will mark the fourth year in a row that the conference will be held in a fossil fuel exporting country.

FROM DUBAI TO BAKU

COP28, which was held in Dubai, was the primary focus of international climate negotiations in 2023. Carbon markets were not at the forefront of the agenda at COP where more focus was paid to the first GST and the tightening of objectives under the Paris Climate Agreement. Recent reports have shown that nearly all Paris Agreement signatories have fallen far short of the necessary targets to meet their initial climate targets – both individually, and collectively. The GST is designed to gradually tighten environmental action in order to meet the objectives outlined at Paris. In Dubai, a [final text](#) was adopted at the tail end of the conference promising to “transition away” from fossil fuel use, although this language has been subject to criticism for failing to use the stronger “phase out” language, or include a timeline for Parties to do so. The final text is a compromise between the pre-COP draft which included the controversial “phase out” of fossil fuels language and a much looser draft that stuck to the “transition towards low emissions systems” language adopted at COP27 in Sharm el-Sheikh. Still, many countries – particularly in the Global North – consider the final “transition away from fossil

fuels” language as weak and likely subject to a wide array of different interpretations by Parties, as it does not set any particular formal goals or timeframes. Additionally, in line with the fossil fuel “transition” goal, Parties pledged to triple global renewable capacity to at least 11,000 GW via the [Global Renewables and Energy Efficiency Pledge](#).

There is no formal timeline to reduce fossil fuel use, even for countries which are particularly big emitters, and the world is currently going into a [“Mega Election Year”](#) which is expected to see a record number of people eligible to cast ballots. This has potentially significant ramifications in the US where a potential change in administration would result in a big shift in US energy policy. President Joe Biden has largely been supportive of environmental efforts overall, and the possibility of another Trump presidency or another Republican Congress would put that in jeopardy.

The Environmental Protection Agency [announced new rules](#) in December 2023 to cut emissions from oil and gas operations, but another Trump administration would almost certainly scrap all of those rules, while likely trying to withdraw the world’s second largest emitter from the Paris Agreement – again. European Parliament elections are due in 2024, and a change in the makeup of the Chamber could well imperil the Commission’s ambitious decarbonization roadmaps, particularly given the rise of populist right-wing parties across much of the Bloc and a pushback from agriculture. New Zealand, which held elections in 2023, is planning to lift the ban of offshore oil and gas exploration, and Norway also [plans](#) to boost oil and gas exploration and raise exports to the rest of Europe.

Azerbaijan, the future host of COP29, is [already planning to raise](#) its fossil fuel production by one-third over the next decade. While not a member of OPEC like COP 28’s host the United Arab Emirates, the country is a large exporter of oil and gas and is considered part of “OPEC Plus.” There has already been an uproar among environmentalists that Azerbaijan will be unlikely to push for stronger language on fossil fuels; Mukhtar Babayev, the COP 29 president-designate, is the current Minister of Ecology and Natural Resources, but [previously spent 26 years](#) working for the state-owned oil and gas giant Socar.

WHAT DID COP 28 MEAN FOR CARBON MARKETS?

There was no agreement reached to finalize carbon trading rules under Article 6, which has both set back progress made by the UN’s Supervisory Body (SB) over the last year and has left the market – particularly Article 6.4 – in limbo for yet another year. This is likely to put more pressure on both bilateral agreements between countries for carbon units and the voluntary carbon market for credits. Of the two major components of Article 6, Article 6.2 was the closest to a consensus at the end of COP28, while Parties were much further apart on Article 6.4. The biggest sticking points in both cases were more political than technical. Unlike the “classic” UN division between the Global North and South, the breakdown in negotiations over Article 6 rules largely came down to how much UN oversight was necessary to oversee carbon trading, both in terms of Internationally Traded Mitigation Outcomes (ITMOs) under Article 6.2 and through Corresponding Adjustment (CA) credits under Article 6.4. The US and many larger nations, including China and India, would like to see the mechanism operate more freely, while the EU and many carbon host countries preferred more UN-level scrutiny and oversight.

No agreement on Article 6 means that a number of serious issues are expected to remain unresolved until the end of 2024 at the earliest. This includes the issue of host country authorization, which allows countries to perform CA, i.e. deducting the traded volume of carbon from a host country mitigation achievement to avoid double-counting. The outstanding questions on registries, accounting, and carbon removals are also unclear. The SB had completed a lot of initial drafting work throughout 2023 on removals and Article 6.4 baselines for COP28 consideration, but both documents were not approved, which will mean largely starting over in 2024. The Parties have almost a year to consider potential loopholes, but as often happens, controversial topics may take several COPs before they are finally settled.

Consequently, it will be unlikely that there will be any Article 6.4 Emission Reduction credits (A6.4ERs) before 2025 at the earliest, and possibly not until later, putting additional impetus on bilateral deals and voluntary credits for 2024. There has already been a push within the VCM to “align” with Article 6 standards, primarily through the

application of CA and host country credit authorization (for more information, please see the Voluntary Market section of this report). However, the lack of consensus at the UN level is going to leave this process a bit more open for interpretation and also carries no guarantee that these types of credits will be recognized post hoc once an agreement is reached. Further, the voluntary market is already facing its own reputational challenges.

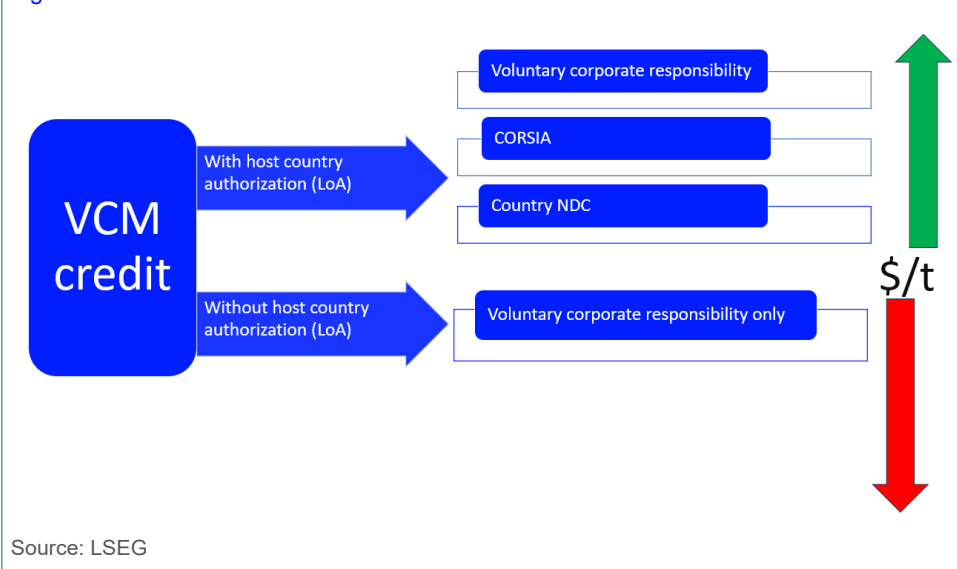
INTERNATIONAL COOPERATION OVER 2023

Even if COP28 did not result in finalized rules around carbon trading, there was still substantial activity in both the lead up to Dubai and on the sidelines of the negotiations. A number of countries have been encouraging polluting industries towards bilateral carbon agreements since COP27 at Sharm el-Sheikh, and that pattern continued moving to COP, with organizations in [Japan, Switzerland, and Singapore](#) signing multiple bilateral agreements with projects in “host” countries to transfer ITMO-style credit units, often at prices significantly higher than those seen in other carbon markets. Reportedly, the deal between Switzerland’s fossil fuel group and an electric bus operator in Thailand is [valued at \\$30/t](#).

That said, while some countries have been active in this area so far, others have taken a more cautious approach before entering into agreements, and most of the activity is concentrated among about half-a-dozen buyers from the Global North. China, which is in a unique position of being both the largest global emitter as well as a historic host country for carbon projects, has adopted more of a “wait-and-see” approach to international carbon trading ahead of finalization of Article 6 rules; according to [Tsinghua University](#), the country will become a net importer of Article 6 credits by 2030 (For more information about Chinese carbon markets, please see the China section of this report.)

At the moment, compliance with Article 6 is being viewed as a marker of carbon unit integrity, but it remains to be seen whether or not that reputation will carry through if and/or when trading begins. The UN’s Kyoto-level Clean Development Mechanism (CDM) and Joint Implementation (JI) credits struggled amid credit integrity concerns and were dropped by many buyers even before

Figure 11.6: Structure of international collaboration



the program was suspended. The UN’s new mechanism is meant to address these legacy “errors”, but even now, the initial plans drawn up by the SB use some aspects of the old CDM mechanism, with some projects eligible to be transferred over to A6.4ERs. (For more information, please see [our analysis](#) on the SB 2023 proposals). As of the end of 2023, the UN’s application deadline, more than 1,000 projects registered under CDM have [applied for transition](#) (*subscription required*) to the Art. 6.4. scheme, the majority of which plan to keep using CDM methodologies as permitted by the UN’s “grace period”; only 76 projects [are planning to replace](#) these methodologies ahead of the grace period. Further, many of the projects that have applied to transition are renewable energy projects, which often raise questions about additionality.

More and more countries have begun to set up their own compliance and voluntary schemes domestically. In 2023, Brazil, India, Egypt, and Indonesia, among others have either set up, or are in the process of setting up their own schemes. (For more information about these projects, please see the section on Emerging Carbon Markets.) Each country has its own objectives and background in the establishment of a domestic market, but most countries have cited their own NDCs as a major objective. It is also likely that some countries are looking to manage their potential exposure to extra-border carbon taxes, most notably the European Union’s Carbon Border Adjustment Mechanism (CBAM). (For more information about CBAM, please see the EU section of this report.)

OUTLOOK FOR 2024: ALL EYES ON BAKU

Given where things ended in Dubai, it is unclear whether Article 6 will be settled at COP29, particularly given the potentially volatile political environment facing some of the loudest voices. There is still a significant difference in opinion between the Parties, with the EU particularly skeptical about credit-based offsetting markets in general, a position they are unlikely to waver on. The prospect of an Administration change in the US raises questions about whether the US will be in a position to do very much at all – COP29 is scheduled to begin a mere few weeks after the election. As it stands, there will likely be additional bilateral agreements in the spirit of Article 6.2, which may transition to formal ITMO status in the event of an agreement, although this will likely remain limited in the absence of a formal agreement.

12. Emerging trading schemes

BRAZIL

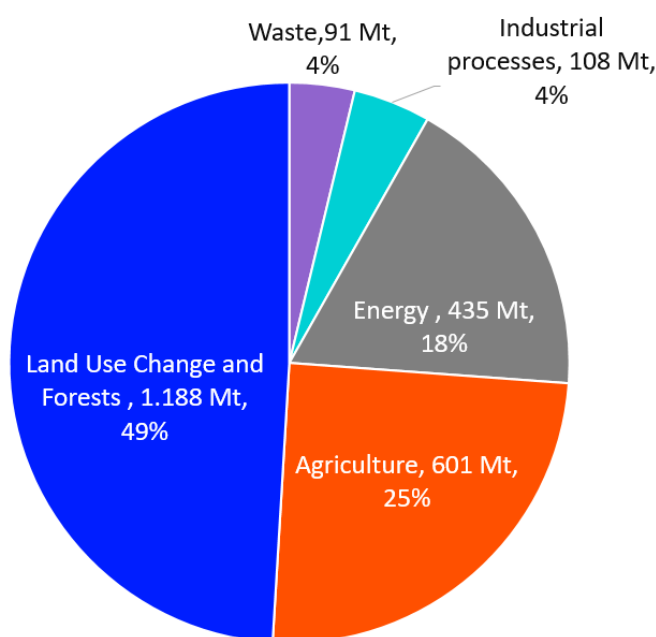
After almost a year of bouncing back and forth between Brazil's two legislative houses, the Brazilian GHG Trading System (SBCE, original Portuguese acronym) was [finally approved](#) (*subscription required*) by the lower house of Congress, the Chamber of Deputies; the bill had already been approved by the Senate, the upper house. Brazil's President [had hoped](#) (*subscription required*) to have the legislation ready for COP28, approval did not come until a few days after the conclusion of negotiations in Dubai. That said, Brazil pushed the bill through faster than many expected it could, and the approved document represents a mixture of proposals from the Federal Senate and current president (version [PL 412/2022](#)), with multiple amendments included into the text following Senate approval in October 2023.

The [approved text](#) (*subscription required*) creates an emissions trading scheme for heavy industry; the regulated sectors have not yet been defined, but the legislators aim to cover such areas as steel, cement, chemicals, aluminum, and power generation. How the quota will be distributed and the role of carbon credits somewhat resembles the setup of the Korea ETS, with companies set to receive governmental allowances for free initially, with later purchase of these permits coming once the system is fully operational (estimated to be over a period of 4-5 years). Compliance will be mandatory for companies emitting over 25,000 tCO₂e per year, while companies with emissions over 10,000 tCO₂e annually will have to report their emissions, but they are not under obligation to reduce emissions or cover them with permits.

Moreover, the companies will be allowed to use offsets, so-called Certificates of Verified Emission Reduction or Removal to satisfy a particular percentage of the reduction gap. The projects generating such offsets will come from the voluntary standards, but they will be limited by the ones corresponding to the criteria (or methodologies) yet to be developed by the Brazilian legislators, thus limiting the number of carbon units eligible for compliance under the Brazil ETS. In addition to domestic use, those same credits will be also allowed for international transfer under the Paris Agreement Article 6, following the approval of the national authorities to avoid double counting.

With this, Brazil officially opens the door for its voluntary market to supply credits

Figure 12.1: Brazil GHG emissions (Mt) in 2021 by sector



Source: SEEG

to overseas users under Article 6. It is not yet fully clear what role the voluntary credits that do not correspond to the SCBE methodologies will play in the new ETS or Article 6, if any. While it is not yet clear how government-approved units will price, but the few existing examples of credits with host country approval (Rwanda, Malawi) are roughly double the price of non-approved credits in the voluntary carbon markets as of this writing. The Brazil ETS law has already excluded certain schemes from being used for offsetting purposes: the document distinguishes between REDD+ projects using a market approach (i.e. the ones currently operating at the VCM) and REDD+ with non-market approach; the latter, which are so far not being considered for the ETS, involve intergovernmental cooperation on forests developed through the UNFCCC.

Brazil's extensive forestry sector has been initially excluded from the SBCE draft, as has its enormous agricultural sector – together responsible for nearly three-quarters of the country's total emissions (Fig. 12.1) – as of the latest bill. Landfill emissions are also not included. Altogether, these omissions are expected to reduce Brazil's ETS coverage by as much as 80% and will significantly limit its mitigation impact. Potentially, farmers and landowners can implement carbon projects on their territories and thus still contribute to the overall reduction goal, although limits on the role offsets can play in the Brazil ETS is

likely to put limits on the contributions these sectors can make to the country's target.

Despite passing the Chamber of Deputies, the draft will now have to return to the Senate and then be sent to the President to be signed into law. Likely, it will still be several years before the Brazil ETS is operational as, following the approval of the law, the required infrastructure will need to be set up, as well as a National Allocation Plan, determination of free allocation, detailing eligible offsetting methodologies, etc. The implementation of the SBCE was previously divided into several phases, with the final one (i.e. implementation) beginning late 2027, provided the ETS bill became law in 2023. Given that the final law has still not been approved, it is likely that the scheme might not start until close to the end of the 2020s.

Shortly before COP28, Brazil [submitted](#) stronger Nationally Determined Contribution (NDC) targets to the UNFCCC, increasing its ambition to reduce GHG emissions by 48.4% below 2005 levels for 2025. It is probable that local lawmakers would wish to align the new NDC's goal with national policies, such as country's ETS, when deciding on free allocation or offsets use.

INDIA

India, the world's third largest emitter of carbon, is currently in the process of developing its own domestic carbon market as a tool to abate emissions from carbon intensive activities through the Indian Government's [Energy Conservation \(Amendment\) Bill](#). The Indian government's vision for its carbon market strategy is to cover high-emitting sectors such as power, steel, and cement and be implemented in three separate phases:

1. Expand demand for voluntary carbon market credits;
2. Expand supply of VCM credits;
3. Transition the market into a compliant cap-and-trade carbon market.

In the summer of 2023, the [Indian Ministry of Power](#) notified India's Carbon Credit Trading Scheme to develop the country's domestic carbon market. Although the ambition to develop India's national carbon market is notable, the prospect of expanding a voluntary market that then transitions into a compliant allowance market will not be without challenges.

Part of the push to build up the Indian carbon market may be attributed to the EU's implementation of CBAM as well as the UK's plans to bring in their own CBAM. India is a significant exporter to both. (For more information please see the EU section of this report.) As the EU uses its regulatory power to influence third country environmental policies, many countries with strong historical trade flows to the EU are considering how they can lower the financial burden of potential trade diversion caused by the EU's carbon border levy. Implementing a well-designed and comprehensive compliance market would allow India to lower its CBAM obligations; the EU allows for carbon allowance prices or prevailing carbon taxes to be deducted from CBAM payments, but this would not include an expanded VCM.

The abundance of low-cost voluntary carbon credits in the Indian Carbon Market (ICM) could put into question the efficacy of a transition to a compliance market, particularly if price signals remain murky due to a lack of internationally recognized standards for credits. A compliance allowance carbon market requires strong political backing from a central government, alongside regulatory frameworks such as a carbon registry, systems for monitoring and auditing, a well-developed auctioning process and clear emissions reduction targets reflected in a lowering cap – not all of

which are requisites for a voluntary market. In an allowance market, all actors know that one allowance is equivalent to the right to emit one tonne of CO₂, whereas what impact one voluntary carbon credit has on decarbonization, whether it be a reduction or a removal, can be a bit murky. The first two phases of the Indian carbon market, at least under the current outline, do not necessarily establish the infrastructure necessary to build a compliance market, though they may increase the awareness of carbon markets for companies operating in the relevant sectors.

2024 will be an exciting year as both voluntary and compliance carbon markets continue to become more of a driving political narrative vis-à-vis the decarbonization effort for the world's most populous country. The [Indian Ministry of Power's blueprint](#) for expanding the carbon market will have to be taken up again in 2024, however the draft emphasized regulations for an expanded voluntary carbon market, indication that India is setting the stage to enter phase one of its three phase market development pathway.

INDONESIA

Indonesia launched its intensity-based ETS in the first half of 2023, building on its role as a major host country for voluntary carbon market projects in order to create a system that aims to meet its ambitious NDC [reduction targets](#). To facilitate this process, the [Indonesia Carbon Exchange \(IDXCARBON\)](#) launched its first carbon trading platform for entities regulated under Indonesia's new ETS.

The first phase is set to run through to the end of 2024 and covers coal power production plants with an output of 100 MW or greater. While initial participation is voluntary – albeit heavily encouraged – 99 power plants participated in the ETS in 2023, covering approximately 86% of Indonesia's overall power generation capacity. The system is scheduled to expand outwards in phases, with this initial, voluntary phase set to be followed by Phase 2 in 2025 and Phase 3 in 2028, gradually expanding across the power sector to cap emissions from power generation at 290 million tonnes per year by 2030. Oil and gas power production is set to enter the ETS in 2025.

In order to support carbon trading, IDXCARBON has launched specific standardized products for both the compliance sector ([PTBAE-PU](#)) and the voluntary sector ([SPE-GRK](#)).

A total of 459,914 metric tons traded on the first day of the IDX launch, but demand has subsequently fallen back across the second half of 2023. It is expected to take some time for Indonesia's contracts to start trading liquidly, and their relative success will likely be tied to the health of the broader international carbon ecosystem.

Further, demand should increase with the start of Phase 2 under the government's hybrid "cap and trade and tax" [mechanism](#) which will allow companies to avoid the tax penalty of exceeding their individual cap, by buying unused emission allowances from another regulated entity. The tax rate will eventually be linked to the price of the domestic carbon.

Indonesia is already a major voluntary carbon project host country given its potential for renewable energy and abundant tropical forests, and it is likely that the number of renewable energy projects will grow substantially in the coming years in line with more active carbon trading as a way to secure more climate financing. [According to Indonesia's energy ministry](#), the implementation of carbon trading has the potential to reduce GHG emissions by more than 36 million tons of CO₂ by 2030, which is crucial in achieving country's NDC targets.

EGYPT

After announcing a voluntary carbon market [framework](#) at COP27 in Sharm El-Sheikh in 2022, Egypt is now aiming to launch a pilot compliance market in Q1 2024. At COP 28 in Dubai, the [Egyptian Exchange \(EGX\)](#) [declared](#) (*subscription required*) that they were planning to launch the first regulated African Voluntary Carbon Market (AFRICARBON) to support corporates both in Egypt and across Africa to achieve an intermediate reduction target of 33% compared to business as usual by 2030. AFRICARBON is a joint project from EGX and the Egyptian Financial Regulatory Authority (FRA).

There have already been [concerns](#) (*subscription required*) raised in both the carbon sector and the broader international arena about possible conflicts of interest in the program given Egypt's highly-concentrated agro-industrial sector, as well as the Egyptian government's control over the regulation and verification process across the project chain. Together, these concerns create risks around the transparency and integrity of projects and can ultimately lead to additional questions about credit credibility.

That said, the project has the early support of several international Standards, including the Gold Standard (GS), which worked with Egyptian authorities to establish the initial system in 2023. GS has [expressed](#) that it continues to support the initiative and has expressed no initial concerns about market transparency. Activity on AFRICARBON is still limited when compared to activity in the wider VCM. According to FRA, about 230,000 carbon certificates were issued under eight existing projects, with credits from renewables dominating. The Egyptian government is aiming to expand the market to draw climate investment to the country by selling surplus certificates internationally.

While the government is aiming to launch a pilot compliance market as soon as Q1 2024, it is unlikely that a market will gain substantial momentum earlier than 2025 or even 2026, depending on how long Egypt intends to run the pilot phase. The new compliance carbon market will target companies and institutions that operate in a number of industries, including fertilizers, transportation, renewable energy, construction, mining and petroleum. This new compliance market already has [support](#) from the World Bank who is acting as the main advisor during its establishment phase, and the Egyptian government has been proactive in beginning work on the necessary legislative frameworks.

Finally, Egypt has already been active in engaging in the international markets under Article 6 of the Paris Agreement and is already moving to participate in Article 6.4 in particular, even without full confirmation of the rules from the UN. Egypt's updated [NDC](#) from 2022 specifically calls out the country's aim to participate in Article 6 of the Paris Agreement, while also highlighting its focus on deployment of renewables to hit a 42% installed capacity target by 2030.

TURKEY

Turkey has been working on establishing its Emission Trading System for the last 10 years through capacity building projects. The government [introduced](#) a monitoring, reporting and verification system in 2015 in order to gather installation level GHG data from both industry and electricity generation and create a realistic allocation plan for a fully functioning ETS based on historical emissions.

The plan is to start with a [pilot phase](#) from January 2025 that includes large emitters with an allocation framework based on historical emissions of the installations. The plan is to limit the number of market participants to incumbent installations, and sanctions will be implemented with deductions and with some exemptions in order to make it more manageable for entities in its initial stages.

The implementation schedule is outlined a number of public policy documents, including the [Medium Term Programme](#) (2024-2026), the [12th Development Plan](#) (2024-2028), and is also highlighted in Turkey's [updated NDC](#).