Compliance Carbon Markets

Final Report

The Board
OF THE
INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS

FR /09/23	**JULY 2023**

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Executive summary

Compliance Carbon Markets (CCMs), or Emissions Trading Systems (ETS) markets, fall under two broad categories. The first and most widely used type of compliance carbon market, also called "cap-and-trade", is set by "cap-and-trade" regulations. In these markets, carbon emission allowances for domestic firms and sectors are issued by governmental organizations. These allowances mandate the maximum amount of CO_2[1] that holders are permitted to emit. Each allowance (or emissions permit) typically allows its owner to emit one ton of a pollutant such as CO_2. These may be subsequently traded in a secondary market, with corporations seeking to buy and sell allowances in accordance with their own organizational needs (for example, a corporation which has emissions exceeding its allocated cap may seek to purchase additional allowances). In the second type of compliance carbon market, called the "baseline-and-credit system", there is no fixed limit on emissions but carbon emitters that reduce their emissions more than they would otherwise be obliged to can earn allowances that they can sell to others who need them.

Various jurisdictions have established compliance carbon markets since 2005, and, as a result of new commitments, additional jurisdictions are exploring the possibility of establishing compliance carbon markets. Indeed, a recent report by the International Carbon Action Partnership suggests that "*there are now 29 such systems in force, three more than last year, with 20 more systems under development or consideration across the world, particularly in the Latin American and Asia-Pacific regions. For the first time, we see concrete steps towards emissions trading being taken in Africa*."[2]

However, for these markets to be effective in meeting their decarbonization goals, it is important that they are underpinned by the same principles as any sound and robust regulated financial market, namely orderly functioning, transparency, integrity, stability and accountability.

With the aim of contributing positively to the debate on how to establish sound and well-functioning compliance markets, IOSCO issued a Consultation Report on 9 November 2022 which explored the functioning of existing and well-established compliance markets in order to gain an understanding of potential vulnerabilities in their functioning and how to mitigate these.

We received a total of nineteen (19) responses to the Consultation Report. Overall, respondents were supportive of IOSCO's work and were broadly in agreement with the proposed recommendations set out in the Consultation Report. We are grateful for the responses received. This Final Report (thereafter "the report") builds on the Consultation Report and the responses received to the consultation.

Building upon the lessons learned from existing compliance carbon markets and good practices in commodity derivatives markets, this report delves into both primary markets and secondary markets considerations, spot and derivatives trading.

On primary markets, the report highlights aspects related to the mechanisms to allocate allowances, in particular how free allocation, although intended to minimize the risk of carbon leakage, can at the same time disincentivize compliance entities from participating actively in secondary markets. In addition, the report addresses historical challenges, such as oversupply

[1] CO2 here is used to describe both Carbon Dioxide emissions and Carbon-Dioxide Equivalent emissions.

[2] https://icapcarbonaction.com/en/publications/emissions-trading-worldwide-2023-icap-status-report

of allowances, and describes market stability mechanisms that jurisdictions have implemented in response, which vary between price-based mechanisms and volume-based mechanisms. Finally, the report highlights the important function of ETS registries in avoiding double counting, in enhancing market monitoring and data quality, and in promoting transparency.

In a compliance carbon market, once allowances have been distributed, via free allocation and/or auctioning mechanisms in jurisdictions where CCMs exist, entities can either use secondary markets for further trading or bank any surplus they have for future use, subject to relevant regulations. Therefore, the report also considers the functioning of secondary markets, spot and derivatives.

This report suggests the same comprehensive oversight that promotes transparency and integrity in commodities markets could be applicable to CCMs as well. Some jurisdictions classify both allowances traded in spot markets and in derivatives markets as financial instruments and such that they fall within the scope of securities regulation in those jurisdictions – including with regards to market abuse and money laundering. Generally, regulatory frameworks seek to address concerns such as (i) conduct issues, including conflicts of interest, (ii) potential lack of transparency, oversight and monitoring of trades, and (iii) fraud, insider trading and price manipulation.

With those considerations in mind, the report identifies a set of recommendations for CCMs in addressing issues around integrity and orderly functioning, including secondary markets in both spot and derivatives markets. The aim of these recommendations is to support jurisdictions seeking to establish new or to enhance their existing compliance carbon markets to do so in the most effective way possible, learning from the experience of others.

The report includes a total of twelve recommendations relating to primary market functioning, transparency and predictability of primary market decisions; market structures for primary markets, covering allowance allocation mechanisms, market stability mechanisms and primary market access; and secondary market functioning, with particular focus on market integrity, transparency and structure.

Finally, the report includes a section on international carbon markets and a unique carbon price, to consider mechanisms that would, over time, lead to a consistent price for carbon globally. In doing so, it highlights a set of benefits and challenges to the current linking of CCMs, bringing forward the few cases where CCMs have been linked so far.

The structure of this Report

The report is structured around six chapters. Chapter 1, the introduction, provides a high-level description of the carbon market ecosystem and identifies the objectives and scope of this report. Chapter 2 provides a description of existing CCMs while Chapter 3 and 4 give a general overview of primary and secondary markets functioning respectively. Both chapters include general challenges and best practices from jurisdictions that have implemented ETSs. These two chapters were included in the consultation report and have been kept in the report to share lessons learned. Chapter 5 elaborates on the regulatory frameworks currently applicable to CCMs where these exist, highlighting which existing IOSCO principles may form the appropriate baseline upon which to build additional recommendations specific to compliance markets. Chapter 6 addresses recommendations to relevant authorities (financial market regulators, as well as public policy governmental organizations) to allow jurisdictions the flexibility they may require as they establish CCMs in their jurisdictions. Some recommendations address the functioning of primary markets, while others address the functioning of secondary markets; spot and derivatives; noting the IOSCO Principles for the

Regulation and Supervision of Commodity Derivatives Markets appear applicable to emission allowances markets. The CCM recommendations in this report have been revised in light of the feedback received from the consultation. Finally, Chapter 7 presents some considerations for jurisdictions that may be thinking about linking their frameworks.

Chapter 1 - Introduction

1.1. Overview of the carbon markets ecosystem

Carbon markets have been identified as a key tool for governments and private sector institutions seeking to achieve climate change objectives. These markets have the overall objective of mitigating climate change. They do so by putting a price on carbon emissions that promote the reduction of CO_2 emissions into the atmosphere or allow for the compensation of emissions using climate change mitigation projects.

The carbon markets ecosystem is a complex one given the existence of different types of markets and different mechanisms, within those markets. The table below provides an overview of the different market types, mechanisms, and types of products issued:

Type of market	Mechanism	Issued product
Compliance Carbon Markets (CCMs)	Cap-and-trade mechanism	Carbon emission allowances
	Baseline-and-credit mechanism	Carbon emission allowances
Voluntary Carbon Markets (VCMs)	Project-based mechanism	Avoidance carbon offsets credits Removal/Sequestration carbon offset credits.
Article 6.4 of the Paris Agreement	Project-based mechanism	Art.6.4 Emission Reductions (Art.6.4ERs)
Clean Development Mechanism (CDM)	Project-based mechanism	Certified Emission Reductions (CERs) Credits

Compliance Carbon Markets (CCMs), also called "Emission Trading Systems (ETS)" are created and regulated by mandatory national, regional, or international carbon reduction regimes.[3] Their overall objective is to reduce CO_2 emissions. There are two types of mechanisms within compliance markets, and both use tradable allowances to give companies within specific industries the right to emit one ton of CO_2.[4]

(a) The first type is called the **"cap-and-trade" mechanism** and is the most common type of compliance market. It is called "cap-and-trade" because governmental authorities set an upper limit on the total amount of CO_2 that an industry sector can emit. This cap is reduced over time by a predetermined amount. In these markets, carbon emission allowances for domestic firms and sectors are issued by regional, national, and international governmental organizations. These allowances mandate the maximum amount of carbon that covered entities are permitted to emit. Each allowance (or emissions permit) typically allows its owner to emit one ton of a pollutant such as CO_2. These are subsequently traded in a secondary market, where the market price of an allowance is determined by supply and demand, with corporations seeking to buy and

[3] https://www.offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/mandatory-voluntary-offset-markets/

[4] https://openknowledge.worldbank.org/entities/publication/a1abead2-de91-5992-bb7a-73d8aaaf767f

sell allowances in accordance with their own needs (for example, a corporation which has exceeded its allocated allowance may seek to purchase additional allowances from a corporation that has excess allowances i.e. actual emissions below capped amount).[5] Some jurisdictions that have established cap-and-trade systems include the European Union (EU), the United Kingdom (UK), New Zealand, South Korea, California (US) and Quebec (Canada), and Mexico.

(b) The second type of mechanism is called a **"baseline-and-credit system"** whereby baseline emission levels, i.e., target levels decided by the governmental authorities based on historical data and environmental objectives, are defined for compliance entities and allowances are issued to those that have reduced their emissions below that level. As such, polluters that reduce their emissions below this level have excess allowances that they can sell to others looking to stay below their baselines. Those emitting more than their baseline do not necessarily face penalties, but they would also not earn carbon allowances.[6] China is one jurisdiction that has opted for a baseline-and-credit system. Australia also uses baseline-and-credit systems for its emission reduction fund initiative (however, baselines are set within the context an overarching cap on absolute carbon emissions that will reduce over time). While voluntary in nature, carbon emissions are registered at country-level, after which companies can apply for allowances – called Australian Carbon Credit Units ("ACCU") - for the projects they have put in place that reduce carbon emissions. This voluntary initiative mostly touches the metal and other material sector, as well as oil and transport.[7]

In **Voluntary Carbon Markets (VCMs),** entities voluntarily buy credits generated from projects that either (i) avoided CO_2 emissions, (ii) assisted in the reduction of emissions, or (iii) permanently removed emissions from the atmosphere, thereby allowing these buying entities to offset some or all of their own carbon emissions. These projects are verified by standard setters through varying methodologies, after which the standard setter issues the carbon offset credit. The Boston Consulting Group and Shell have suggested that avoidance credits have been the most prolific type of offset credit thus far, comprising as much as 80% of the credits issued between 2015 and 2021.[8] The type of project underpinning offset carbon credits and the lack of ex-post monitoring of emissions may therefore have consequences on the integrity of the credits themselves and create reliability risks.

There is a third type of market mechanism, falling under **Article 6.4 of the Paris Agreement;**[9] with the United Nations acting as the supervisory authority. Article 6 of the Paris Agreement

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5 https://www.offsetguide.org/understanding-carbon-offsets/other-instruments-for-claiming-emission-reductions/allowances/

6 https://openknowledge.worldbank.org/entities/publication/a1abead2-de91-5992-bb7a-73d8aaaf767f

7 https://www.cleanenergyregulator.gov.au/Infohub/Markets/Pages/About-Carbon-Markets.aspx#:~:text=National%20carbon%20markets&text=the%20Emissions%20Reduction%20Fund%2C%20which,scale%20technology%20certificates%20(STCs)

8 https://www.shell.com/shellenergy/othersolutions/welcome-to-shell-environmental-products/_jcr_content/root/main/section/simple/page_header/links/item0.stream/1674112112488/ea9cd7629a713c0efa53be567b2d81bcbcd704a7/the-voluntary-carbon-market-2022-insights-and-trends.pdf

9 https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

establishes three approaches for countries to voluntarily cooperate in achieving their emission reduction targets and adaptation aims set out in their national climate action plans under the Paris Agreement (Nationally Determined Contributions, or NDCs). One approach is through the Article 6.4 Mechanism, a mechanism "*to contribute to the mitigation of greenhouse gas emissions and support sustainable development*" (Paris Agreement, Article 6, paragraph 4).[10] Through this mechanism a company in one country can reduce emissions in that country and have those reductions credited so that it can sell them to another company in another country. That second company may use them for complying with its own emission reduction obligations or to help it meet net-zero.[11] It should however be noted that while the Supervisory Body under the United Nations has been established, the details of how the Article 6.4 Mechanism will operate remain generally to be decided at this stage.

The Article 6.4 mechanism is similar in nature to the Clean Development Mechanism (CDM) established under the Kyoto Agreement.[12] The CDM was the world´s first international carbon market scheme. It allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one ton of CO2, which can be counted towards meeting Kyoto targets.[13]

1.2. Objective and scope of the report

As noted above, various jurisdictions have established CCMs since 2005 and, as a result of new commitments to mitigate climate change (such as the Paris Agreement), additional jurisdictions are exploring the possibility of establishing these markets. However, for these markets to be effective in meeting their decarbonization goals, it is important that they are underpinned by the same elements as any sound and robust regulated financial market, namely orderly functioning, transparency, integrity, stability and accountability. This report (thereafter "the report") builds upon the lessons learned from existing CCMs and good practices in commodity derivatives markets with the aim of setting out a set of recommendations for the establishment of CCMs.

While overarching responsibility for aspects of compliance carbon markets, notably as far as primary markets are concerned, resides at the level of legislative bodies, there is a role for market regulators in promoting integrity and optimizing effectiveness in carbon markets across the ecosystem – including both primary and secondary markets, spot and derivatives, noting this role is likely most prevalent in secondary markets.

To reach its recommendations, IOSCO undertook a fact-finding exercise and a literature review. In the first instance, IOSCO surveyed jurisdictions that form part of the Sustainable Finance Task Force as well as jurisdictions from its Growth and Emerging Markets Committee. Many financial regulators collaborated with environmental agencies in charge of supervising parts of their domestic markets in answering IOSCO's survey. In addition, IOSCO organized a roundtable with participants from government agencies, the regulatory community,

10 https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism

11 https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism

12 https://digitallibrary.un.org/record/250111?ln=es

13 https://unfccc.int/process-and-meetings/the-kyoto-protocol /the-clean-development-mechanism

academics, trade associations, compliance firms as well as financial institutions who participate in these markets. The final recommendations proposed in this report also leverage on the responses to the public consultation that began in November 2022 and ended in February 2023.

Some respondents suggested that the scope of the report, i.e., the compliance carbon market, could be extended, either by covering both CCM and VCM, or by expanding it to other environmental markets.

First, one respondent to the IOSCO Consultation Report suggested that the purpose of CCMs and VCMs was identical, thereby warranting a consistent policy approach that would apply to both markets. This respondent suggested IOSCO should not distinguish between the two markets when drafting their final recommendations.

While we understand the underlying objective of this response – and while some of the recommendations for CCMs could also be of use for VCMs – we believe further work needs to be undertaken to account for the specific characteristics of VCMs and their different maturity stage.

Second, some respondents suggested that IOSCO's work should encompass other environmental markets and go beyond carbon markets. We acknowledge last year´s COP15 agreement on a new global biodiversity framework, aiming to protect 30% of the world's land and oceans by 2030 and the fact that this could stimulate innovative schemes such as biodiversity offsets and credits.[14] We also acknowledge that some jurisdictions are already implementing biodiversity certification schemes, very similar to carbon markets, to allow individuals and companies to invest in environmental projects that contribute to a richer biodiversity. These markets may to some extent benefit from the recommendations we are issuing for carbon markets. Nevertheless, the development of these markets is in its infancy and IOSCO has not considered the relevance of the carbon markets recommendations contained in this report for their applicability in other markets. As such, these types of markets, such as biodiversity certification schemes, are not specifically subject to our recommendations for carbon markets, but jurisdictions and other voluntary participants may have due regard to them where they see them as contributing to the integrity of these nascent markets.

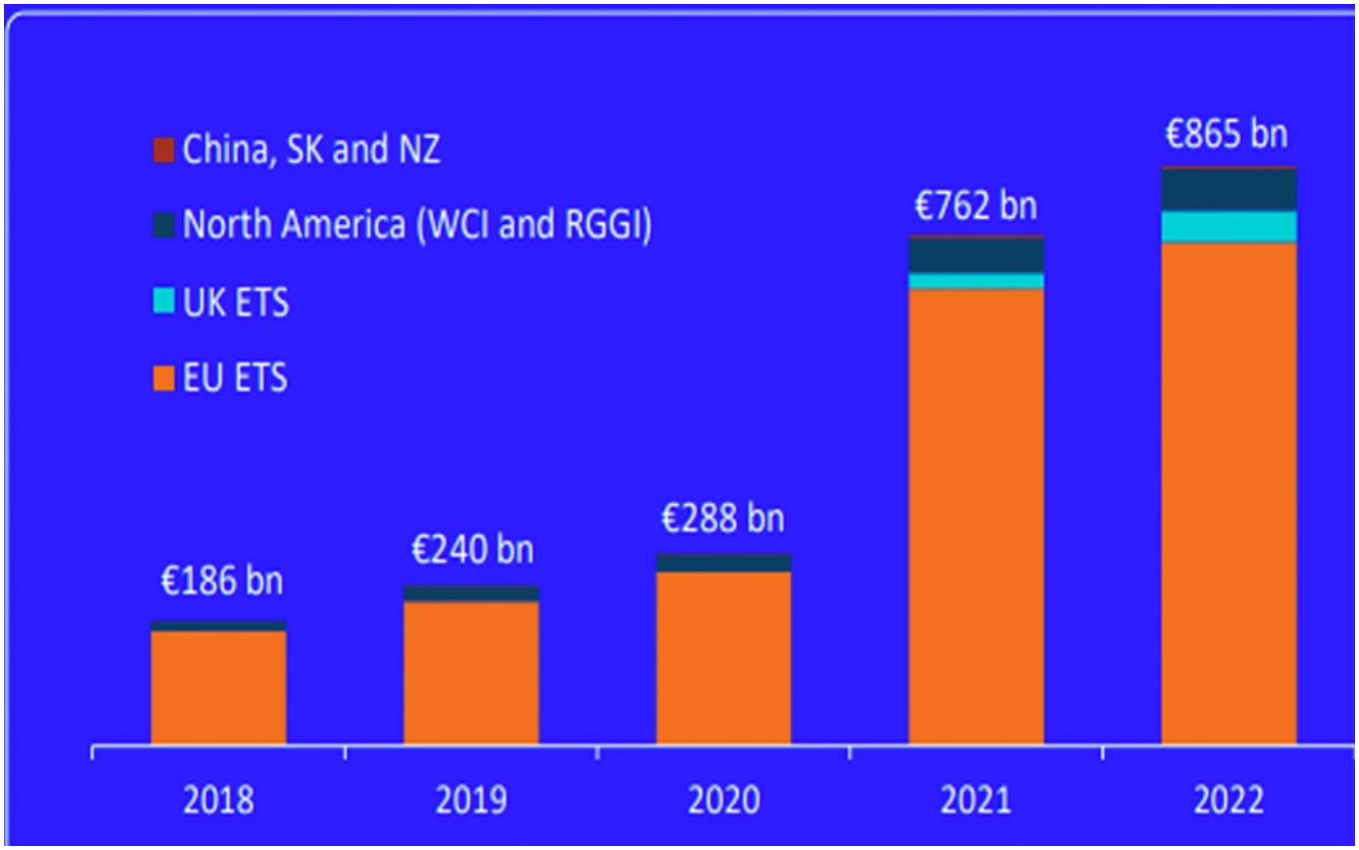
As a result, and similar to the Consultation Report, this report focuses on CCMs, with a follow-up report on VCMs to follow in the course of 2023. In this context, compliance markets are to be understood as the trading of physical (spot) CO_2 emission allowances in primary and secondary markets, and the trading of derivatives on these allowances. In addition, considering the broader use of cap-and-trade systems over baseline-and-credit systems, most of the content of this report is addressed to the establishment of cap-and-trade systems.

14 https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222

Chapter 2 – Compliance Carbon Markets (CCMs): Development and Growth

Carbon markets find their origins in the 1997 Kyoto Protocol, the first international agreement that sought to operationalize greenhouse gas (GHG) reduction actions. The Kyoto Protocol set a per-country cap for carbon emissions. Compliance carbon markets arose as the "trade" portion of an overall "cap-and-trade" framework, and have grown substantially, notably over the last decade.

Chart 1: World carbon markets 2018-2022; total value by segment, total volume



Source: Refinitiv, February 2023

The 2015 Paris Agreement[15] laid out further international CO_2 emission goals and regulations to achieve these goals.[16] Indeed, many government authorities committed to reducing greenhouse gas emissions by 2050, with the objective of limiting global warming to well below 2 degrees Celsius. Discussions at COP26 in November 2021 aimed to further improve these goals by turning into practice Article 6 of the Paris Agreement.[17] These developments have generated further interest in the development of compliance markets across some jurisdictions.

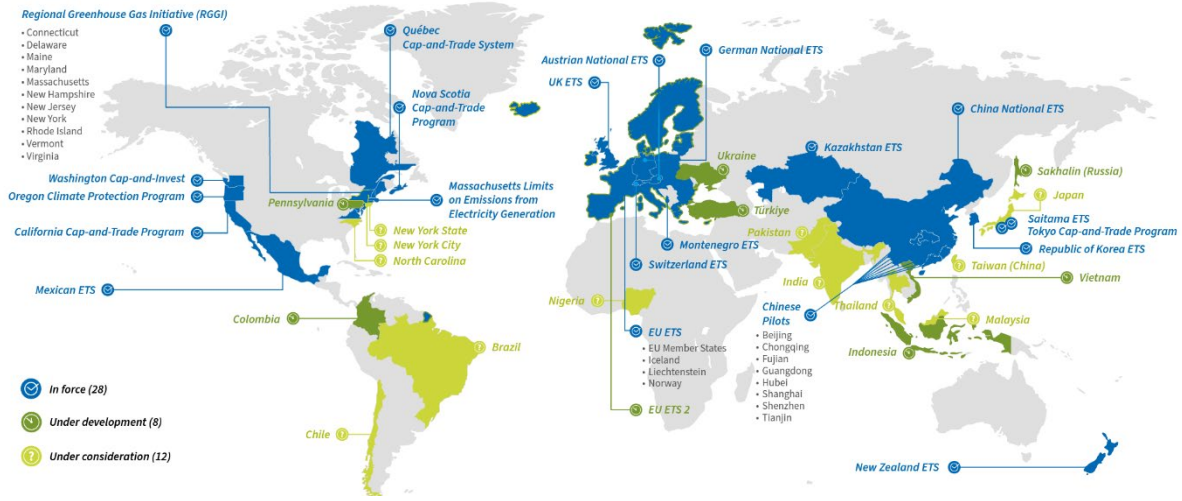
15 https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

16 https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

17 The new rules are designed to avoid double counting of GHG emission reductions and limit the number of past projects that can be counted by a country toward its reporting under the Nationally Determined Contribution (NDC). They also establish a new international mechanism to oversee one portion of international carbon market activity.

Thus far, 29 compliance markets have been implemented globally, with their establishment in some jurisdictions going as far back as 2005.[18] Some examples include the European Union (EU), the United Kingdom (UK), New Zealand, South Korea and Canada. China launched its national ETS (a baseline-and-credit system) in July 2021, after several cities and provinces had been operating pilot ETS programs for several years. In the Americas, Mexico became the first country in Latin America to establish a national ETS in 2020 while Colombia is currently developing one and Brazil and Chile are considering their implementation. The United States does not have a regime in place at the federal level. However, among U.S. states, California operates a compliance market at the state-level, which is linked with Quebec in Canada to form the Western Climate Initiative; and the Regional Greenhouse Gas Initiative (RGGI) operates within about a dozen states along the East Coast of the US. Canada also currently lacks a national compliance market, but regimes are in place in the provinces of Quebec and Nova Scotia. Alternative regimes with some level of market mechanism are also in place in other provinces and territories alongside carbon taxes. The situation is similar in Japan, with regional schemes in Tokyo and Saitama; noting however that the Ministry of Economy, Trade and Industry has announced the establishment of a Green Transformation League as an initiative consisting of companies that will start an ETS program to achieve their emission targets from April 2023. As a result of new commitments – notably under the Paris Agreement, additional jurisdictions are exploring the possibility of establishing compliance carbon markets.

The map below shows the current state of compliance markets and jurisdictions where their implementation is either under development or under consideration.



Source: ICAP

Generally, the implementation of these systems has been a progressive and phased process. In Europe, for example, the implementation of the EU ETS has taken place through four phases up until now.[19] The main evolutions from Phase 1 until now have been: (i) the inclusion of new entities and sectors under the compliance obligations, (ii) the reduction of the allowances allocated for free together with an increase of auctioned allowances, and (iii) the introduction of a mechanism to deal with structural differences between demand and supply.

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18 https://openknowledge.worldbank.org/handle/10986/35620

19 The first phase, from 2005 to 2007, was a pilot. The second phase covered the Kyoto Protocol commitment period, 2008 to 2012. The third phase started in 2013 and lasted until 2020. Every time, changes were made to the regime. The EU is currently in the fourth phase of the system, which covers 2021 to 2030.

The EU ETS is in the process of being reviewed with more ambitious environmental objectives: by 2030, sectors under the EU ETS should reduce their emissions by 62% compared to the 2005 levels (from 43% previously).[20] In December 2022, the European Parliament and the Council of the EU reached a provisional agreement on the reform of the EU ETS which includes (i) rebasing the cap in two steps: in 2024 by 90 million allowances and in 2026 by 27 million; (ii) gradually phasing out free allocation to the benefit of auctions, beginning with the aviation sector; while phasing in the Carbon Border Adjustment Mechanism (CBAM) to address carbon leakages;[21] (iii) updating the parameters of the Market Stability Reserve, which stabilizes the carbon market by removing surplus allowances; (iv) including emissions from the maritime sector in the EU ETS from 2024 and (v) establishing a separate emissions trading system for fuels used in buildings, road transport and other fuel-consuming sectors.[22]

In the UK, the UK ETS Authority published a consultation paper on 'Developing the UK Emissions Trading Scheme'[23] that set out options to explore the expansion of carbon pricing and a call for evidence on the potential role of the UK ETS as a long-term market for greenhouse gas removals.[24] They proposed to align their ETS objectives with their net zero targets, thereby proposing to rebase the cap in 2024. The UK ETS Authority also proposed to expand the scope of its ETS, similarly, to an extent, to the approach that has been taken by the EU as it would include the emissions from the maritime sector. The UK ETS Authority published its initial response suggesting they would be linking their ETS scheme with that of Switzerland for flights between both countries. A further consultation[25] was published on 30 March 2023 to consider the use of a carbon border adjustment mechanism.

In the Tokyo Metropolitan Government Cap and Trade Program, there have also been phases while the Mexico scheme is currently in a three-year-pilot phase, with 2022 constituting the transition year in which the actual binding cap will be set and 2023 being the year in which compliance obligations will enter into force for all covered emitters.[26]

Finally, China first organized pilot regional schemes before launching their national ETS scheme. China's national ETS became operational in 2021 and is focusing initially on the electricity production sector. In its first compliance cycle[27] (for emissions from 2019 and 2020), the ETS covers 2,162 power companies across the country, responsible for a total of

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20 https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7796

21 https://taxation-customs.ec.europa.eu/green-taxation-0/carbon-border-adjustment-mechanism_en

22 https://www.europarl.europa.eu/news/en/press-room/20221212IPR64527/climate-change-deal-on-a-more-ambitious-emissions-trading-system-ets

23 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067125/developing-the-uk-ets-english.pdf

24 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067125/developing-the-uk-ets-english.pdf

25 https://www.gov.uk/government/consultations/addressing-carbon-leakage-risk-to-support-decarbonisation

26 carbon-market-year-in-review-2020.pdf (refinitiv.com)

27 A compliance cycle or period is the period at the end of which an emitter subject to the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances must submit to the government a number of GHG emission allowances equal to the total verified GHG emissions that the emitter reported for the period. https://www.environnement.gouv.qc.ca/changements/carbone/Couverture-en.htm#:~:text=A%20compliance%20period%20is%20a,emitter%20reported%20for%20the%20period.

over 4 billion tons of CO_2 emissions annually.[28] Once fully implemented, the Chinese national carbon market will cover large firms in seven additional sectors: petroleum refining, chemicals, non-ferrous metal processing, building materials, iron and steel, pulp and paper, and aviation. No official timeline has been set as to when each of these additional sectors will join the Chinese national carbon trading market.[29] According to the 2023 draft plan by the National Development and Reform Commission presented to the First Session of the 14th National People's Congress in March 2023, officials will enhance statistical and accounting system for carbon emission; develop a robust trading system for the national carbon market; manage the national ETS' second compliance cycle; crackdown on emission data fraud; and push for the organic connection of the carbon market with systems for trading renewable energy. [30]

28 https://chinadialogue.net/en/climate/how-can-chinas-national-carbon-market-contribute-to-reducing-emissions/

29 https://www.csis.org/analysis/chinas-new-national-carbon-trading-market-between-promise-and-pessimism

30 Report on the Implementation of the 2022 Plan for National Economic and Social Development and on the 2023 Draft Plan for National Economic and Social Development

Chapter 3 - CCMs Functioning at Primary Market Level

Despite differences between ETSs – for example, coverage varies across markets both in terms of sectors[31] and in terms of greenhouse gases[32]- some key principles underpinning compliance markets are similar across the most experienced regimes.

Most ETSs work on a cap-and-trade principle, where a cap is set on the total amount of certain greenhouse gas that can be emitted by sectors covered by the scheme. This is intended to limit the total amount of carbon that can be emitted. If an entity creates emissions as part of its activities, it must procure an amount of emission allowances equal to its level of emissions. Allowances may be (i) obtained for free from the state or an authority under a free allocation regime; and/or (ii) purchased under an auction regime.

Equally, these entities must surrender allowances back to the governmental entity to cover the greenhouse gas emissions that they created. Companies must typically surrender a quantity of emission allowances equivalent to their greenhouse gas emissions from the previous year. In the EU, the Union Registry[33] states how many allowances must be surrendered, based on the emissions data that has been entered and confirmed by a verifier. In the California ETS, covered entities must surrender allowances equivalent to 30% of their emissions from the previous year; while in RGGI every year regulated power plants must surrender allowances equal to one-half of their CO_2 emissions for that year. In both programs, entities are only required to surrender allowances equal to their full emissions, less those already surrendered, every three years at the end of a "compliance period". Failure to surrender on time results in an immediate surrender obligation equivalent to four times the covered entity's missing balance. Other schemes also have specific penalties for non-compliance. For example, penalties for non-compliance with respect to RGGI is set by each participating state, while in the UK, the excess emissions penalty is £100 multiplied by the inflation factor (a measure of the growth in the consumer price index) for each allowance that the operator fails to surrender.

Verification of emissions reduction (i.e., (1 tCO_2 emitted = 1 tCO_2 reported).) in CCMs is a critical step to ensure the overall functioning of these markets and maintain their integrity.

In Europe, industrial installations and aircraft operators covered by the EU ETS are required to have an approved plan for monitoring and reporting annual emissions. Every year, operators must submit an emissions report. The data for a given year must be verified by an accredited verifier by 31 March of the following year. Once verified, operators must surrender the equivalent number of allowances by 30 April of that year.[34]

Likewise, in the California ETS, a Mandatory Reporting of GHG Emissions regulation requires entities that emit over 10,000 metric tons to report their emissions, and entities that emit over

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31 For example, The California program includes transportation and heating fuels whereas the EU and the UK have mostly focussed on electricity and heavy industry. RGGI and China are solely focussing on electricity. The NZ ETS covers a broad range of sectors, which were gradually phased in between 2008 and 2013. This includes forestry, energy, industrial processes, liquid fossil fuels, waste and synthetic emissions.

32 For example, the EU ETS covers CO_2, N2O, and PFCs whereas the China National ETS and Tokyo ETS only cover CO_2. GHG coverage is material given growing concern about the potency of other GHG in particularly methane.

33 The Union Registry is an online database that holds accounts for installations and aircraft operators subject to the EU ETS. https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/union-registry_en

34 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification-eu-ets- emissions_en

25,000 metric tons—which are regulated by the cap-and-trade program—must verify their emissions with an independent third party.

Unlike cap-and-trade schemes elsewhere, China's allocation of emissions allowances is not decided upfront via an absolute cap but is based instead on emissions intensity of electricity production, in an attempt to incentivize a shift from less efficient operators to more efficient ones.[35] The intensity-based allocation does not create an explicit incentive to switch from coal to renewables but is likely to encourage the earlier closure of very inefficient coal plants that are already operating at low rates of capacity.[36]

Compliance entities under the Chinese scheme need to provide information on the volume of emissions as well as economic output on a regular basis. Based on their historical emissions levels and output, enterprises receive allowances. Allowance allocation has begun free of charge, but the official plan suggests that enterprises will need to purchase them over time.[37]

In the national Chinese schemes, free allocation applies differently to small and large power generation units. Allocation of allowances is more generous for smaller generators than for those with larger capacity. The reason for this approach is because in China there is a high concentration of smaller generators in certain parts of the country, which makes these areas very dependent of the energy produced by the smaller generators. Therefore, a potential closure of these smaller generators facilitated by the implementation of a compliance carbon market, can have a big impact on some provinces power supply as well as on local economies.[38]

Once a year, Chinese companies are requested to surrender allowances for the emissions from the previous two years. However, compliance obligations are limited; the Chinese authorities establish a threshold above which no allowances need to be surrendered. In addition, companies with a shortfall of 10% or more can apply to borrow from a pre-approved allocation up to 50% of the shortfall.[39]

Firms under the Chinese ETS are required to monitor and report the amount of CO_2 emissions, which are then inspected and verified by government-certified technical experts. Punitive measures against non-compliance include both financial and non-financial penalties. [40] Indeed, the entity which has made false claims about its emission reductions will see its emission quota for the next year reduced by an equal amount to the falsely stated amount in the year in which the false statement was made, by way of penalty.[41] In addition, failure in reporting and failure in compliance obligations will attract fine of CNY10,000 to 30,000 and CNY20,000 to 30,000 respectively.[42]

35 https://chinadialogue.net/en/climate/how-can-chinas-national-carbon-market-contribute-to-reducing-emissions/

36 https://www.energymonitor.ai/policy/carbon-markets/carbon-trading-the-chinese-way/

37 https://www.csis.org/analysis/chinas-new-national-carbon-trading-market-between-promise-and-pessimism

38 https://chinadialogue.net/en/climate/how-can-chinas-national-carbon-market-contribute-to-reducing-emissions/

39 https://icapcarbonaction.com/en/ets/china-national-ets

40 https://www.csis.org/analysis/chinas-new-national-carbon-trading-market-between-promise-and-pessimism

41 Dentons - The institutional framework for national ETS is coming - the Administrative Measures for Trading of Carbon Emission Rights (for Trial Implementation) promulgated

42 https://chinaenergyportal.org/en/administrative-measures-for-carbon-emissions-trading-trial-implementation/

3.1. Allocation methodologies

Jurisdictions typically have two methods for allocating emission allowances: free allocation and auctions. Independently from the mechanism for allocating them, there is typically an absolute cap which underpins allocation – this is the case for schemes such as those in the EU, UK and in the Americas. China, on the other hand, has a cap based on emissions intensity rather than an absolute cap.

Most compliance markets, such as the California, EU, and UK schemes, operate with similar structures in place. All have a free allocation for specific industries, typically industries where carbon leakage may otherwise happen – while other industries are generally required to purchase allowances, either on the primary market via auctions or on the secondary market.[43] Other jurisdictions currently operate on the basis of free allocations only. This is for example the case in the China national ETS, where benchmarking is used to allocate allowances to covered entities, namely those in the power sector.[44]

3.1.1. Free allocation mechanism

Some allowances are handed out for free to some entities, i.e., entities in industries where emissions are harder to abate, such as energy-intensive industries. The aim is to assist them with competitiveness issues stemming from the activities of industry participants from outside their jurisdictions and in doing so, minimizing the risk of carbon leakage.

However, roundtable participants suggested that providing free allocations can disrupt market functioning as it may disincentivize these entities from participating actively in secondary markets. In addition, roundtable participants noted that there may be little incentive for them to invest in ways to reduce their emissions.

Some jurisdictions are exploring other mechanisms to avoid carbon leakage. For example, in 2021 the European Commission proposed the Carbon Border Adjustment Mechanism (CBAM). Through this mechanism, EU importers would have to buy carbon certificates corresponding to the carbon price that would have been paid, had the goods been produced under the EU's carbon pricing rules. Conversely, once a non-EU producer can show that they have already paid a price for the carbon used in the production of the imported goods in a third country, the corresponding cost can be fully deducted for the EU importer. This mechanism has been designed in compliance with World Trade Organization (WTO) rules. The phasing-out of free allocation under the EU ETS will take place in parallel with the phasing-in of CBAM in the period 2026-2034.[45]

3.1.2. Auctioning mechanism

Allowances not allocated for free are auctioned. The frequency of the auctions varies depending on the jurisdiction. The EU auctioning system is based on daily auctions via the EEX platform.[46] In the UK, the auctions are held every two weeks on the ICE Futures Europe platform.[47] The California and Quebec ETS as well as the RGGI program, in turn, hold auctions on a quarterly basis, as does the New Zealand ETS via EEX.

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43 In the EU ETS, industries not on the carbon leakage list receive 30% of their allowances for free until 2023; they need to make up for the remaining 70% by acquiring EUAs either through primary or secondary markets.

44 carbon-market-year-in-review-2020.pdf (refinitiv.com)

45 https://taxation-customs.ec.europa.eu/green-taxation-0/carbon-border-adjustment-mechanism_en

46 https://www.eex.com/en/markets/environmental-markets/eu-ets-auctions

47 https://www.theice.com/futures-europe/faq

Participation in the auctions can either be limited to compliance entities or open to non-compliance companies. This means that financial entities (such as banks and investment firms), as well as non-financial counterparties without compliance obligations, may be allowed to participate in the auctions subject to meeting entry requirements that vary depending on the jurisdiction.

Compliance entities compose the majority of participants in the primary market, but the role of financial sector participants has also been increasing. In the EU for example, roughly 70% of the market participants in the EU allowances auctions are non-financial counterparties and the remaining 30% are financial entities.[48] It is also worth noting that compliance entities may decide to cover their exposure by taking long positions on the derivatives market rather than purchasing allowances directly through auctions or the spot market, to lower their capital costs and mitigate the financial liquidity restrictions associated with allowances. It is in this context in particular that financial institutions may decide to participate in the auctions, purchasing these allowances instead and taking short positions on the derivatives market.[49]

The requirements to participate in auctions typically include opening an account in the relevant registry and other financial security requirements. In the EU, these requirements are set out in the European Auctioning Regulation and include, amongst other things, opening an account in the Union Registry, being established in the EU, appointing at least one bidder representative, and complying with the admission requirements of the auction platform.[50]

Generally, success in an auction bid will depend on the price and the number of allowances auctioned. In the EU, by way of example, auction clearing prices are determined by the following process:[51]

- The auction clearing price is determined as the price at which the sum of volumes bid matches or exceeds the volume of allowances auctioned.
- All bids with a price higher than the auction clearing price are successful. Execution of bids made at the auction clearing price depends on their ranking in the random selection (i.e., all bids at the same price are not executed following an order based on their timestamp, but according to the order given by the platform's algorithm).
- All successful bids pay the same auction clearing price even if they bid higher.

Other jurisdictions work on the basis of minimum reserve prices to control auction prices. A minimum reserve price is the floor at which allowances can be sold at auction. In the California and RGGI programs, any bids lower than the auction reserve price will not be considered. California set a price floor at $10 per ton in 2012, which increases 5% annually plus inflation; the 2022 price floor is $19.70 (the price floor (or minimum reserve price) at RGGI in 2022 is $2.44). All allowances sold at any one auction are sold at the same price. In addition, RGGI limits the number of allowances that anyone can purchase to 25% of the allowances offered for sale in that auction. The UK ETS auction regulations also sets an Auction Reserve Price (ARP); the minimum price for bids in UK ETS auctions is at £22 in 2022.

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48 ESMA Final Report on Emission allowances and associated derivatives, 28 March 2022, p. 55

49 https://climatestrategies.org/wp-content/uploads/2015/02/Climate-Strategies-MSR-Report-Final.pdf.

50 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010R1031

51 The auctioning process described is based in the EU Auction Regulation (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010R1031).

In the New Zealand ETS, there is a confidential reserve price that prevents the sale of units at auction significantly below prevailing secondary market prices. The confidential reserve price is calculated for each auction using a methodology based on recent secondary market price(s) and considering market volatility. Both the methodology and resulting reserve prices are kept confidential, so as to prevent the confidential reserve price from becoming the target of strategic bidding behavior.

Auction revenues from existing ETSs are used predominantly to tackle climate change. Under the EU ETS, Member States are required to spend at least half of their auction revenues to support greenhouse gas emissions reductions, to deploy renewables and carbon capture and storage, and to improve energy efficiency and district heating. In the California program, revenue generated through the auctions is returned to utility ratepayers through the California Climate Credit and funds the Greenhouse Gas Reduction Fund and the California Climate Investments program, which supports investments in energy efficiency, clean transportation, solar energy, and other greenhouse gas-reducing projects. RGGI states have individual discretion over how they invest auction proceeds. The participating states generally invest the proceeds to benefit consumers (e.g., direct bill assistance), improve energy efficiency, and accelerate the deployment of renewable energy technologies.

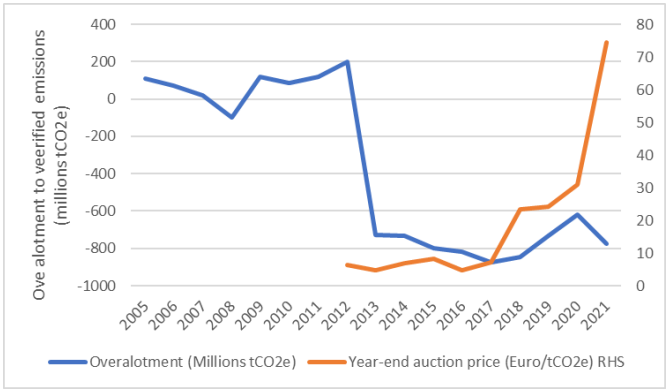
3.2. Market stability mechanisms

In some circumstances, allowable emissions targets in primary markets have exceeded actual emissions, leading to oversupply issues in the market. This has meant the demand for emissions allowances was lower than the supply, which removed the need for abatement. In response, some markets have moved to a very low or zero carbon price.

The EU ETS, for example, has experienced several episodes of oversupply over the years. In phase I (2005-2008), the cap was 118.2 million metric tons of CO_2 ($MtCO_2$) (roughly 2%) above calculated, verified emissions. This surplus was observable in the first two years of the mechanism and only exhibited a shortfall in 2007 (of 11.5 million $MtCO_2$).[52] Consequently, the primary market auction price did not move from zero for the first three years of the mechanism (see Chart 2). Additionally, emissions allowances allocated in phase I were not transferable to phase II of the mechanism. Although secondary market prices peaked at close to EUR30 per $MtCO_2$, when it was announced that European Union Allowances (EUA) contracts were not transferable, the secondary market price for EUA also fell to zero in the first 6 months of 2007 (see chart 3), with little to no trading volume in those same months. In phase II (2008-2012), a surplus was still observable, at a total of 102 million $MtCO_2$. The main reason for this oversupply was the European sovereign debt crisis as economic activity declined, thus leading to a drop in verified emissions. Again, this led to a primary auction price of zero, except for the final year where the price was EUR5 per $MtCO_2$. Much of the oversupply carried over into phase III (2013-2020), which depressed secondary market prices for several years, even though more ambitious emissions caps were put in place.

[52] The oversupply of allowances was the result of several factors. Firstly, member states generally lacked verified baseline emissions data when establishing their caps in their national allocation plans (NAPs), and baseline emissions were generally overstated. Secondly, there was no emission reduction target for member states in the EU; at that time, caps were largely established against a business-as-usual basis with limited ambition. Thirdly, the decentralised approach to cap setting meant that member states had an incentive and flexibility to seek to protect their own industries, and retrospectively, allocations appeared generous relative to emissions.

Chart 2: Allowances Supply and impact on price



Source: EEA, EEX, IOSCO Calculations

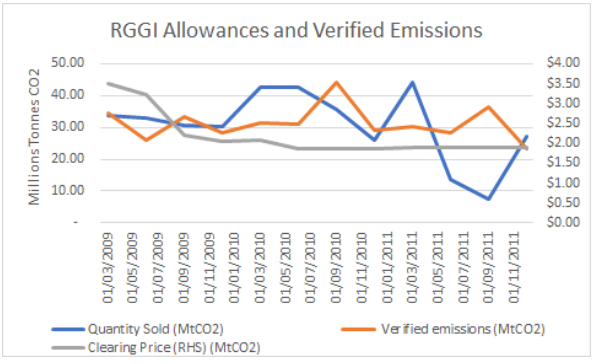
Notes: 1) Interpretation of the chart is as follows. "Overallotment" refers to the number of emissions allowances over and above the verified emission within the EU. A positive number highlights a greater allowance to emit CO_2 than actual emissions. A negative number highlights that emission allowances were less than actual emissions.

Chart 3: Evolution of European Union Allowance prices

Source: Investing.com

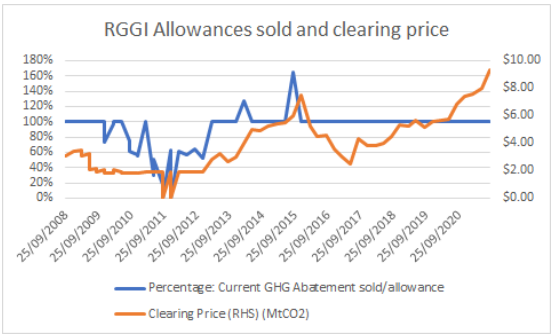
The RGGI ETS experienced a similar issue. Emissions caps were initially calculated on power station emissions between 2000-2004 and a "standard error" was added to the cap to allow for an anticipated increase in emissions before the scheme went live. Soon after, however, verified emissions were found to be much less than the expected level. As a result of the overly generous cap, a surplus of emission allowances accumulated during the control period and manifested itself as a "cache" of unsold allowances. While between 2008 and 2010, most allowances on offer were sold, only 50% sold in 2011. By 2012, the amount of oversupply manifested itself in several periods where abatement allowances were then sold. The accumulated unsold allowances reached 200 million by 2012. As a result of the oversupply and the resulting lack of need for abatement, carbon prices remained low (around $2 per $MtCO_2$) and close to the floor price. Although the cap has been reduced systematically since 2014, even today, the resulting oversupply in the initial stages affects the current primary market clearing price. The current clearing prices move in lockstep with the increase with the price floor.

Chart 4: RGGI Allowances and verified emissions



Source: Regional Greenhouse Gas initiative (rggi.org)

Chart 5: RGGI allowances sold and clearing prices



Source: Regional Greenhouse Gas initiative (rggi.org)

Several lessons can be taken away from these examples:

- First, CCMs are dependent on a consistent and accurate calculation of emissions, from which artificial scarcity is created by setting legal allowances below that of recorded emissions. Where allowances exceed actual emissions, the demand and supply dynamics of price setting can no longer function, even with the inclusion of a price floor.
- Second, policy decisions affecting the issuance of allowances and the debates which precede them can cause price volatility.
- Finally, macro-economic conditions are crucial in determining several key factors in the design of any market - unexpected downturns can make absolute cap metrics look overly generous, which can take many years to unwind and depress auction prices.

As a result, many jurisdictions have implemented mechanisms to guard against excessive market instability, especially in the early years of functioning; noting however that not all compliance markets have these mechanisms in place. For example, there is no such mechanism in the Tokyo cap-and-trade scheme. These mechanisms vary between price-based mechanisms and volume-based mechanisms.

One example of a volume-based mechanism is the EU ETS with the implementation of the "Market Stability Reserve" (MSR) system. The MSR system adjusts auction volumes, by placing allowances in the reserve or by releasing them from the reserve, according to predefined thresholds of the total number of allowances in circulation (TNAC). In any given year, when the TNAC is above 833 million, 12% (and up to 24% until 2023) of the surplus is withheld from auctions; when it is below 400 million, 100 million allowances are taken from the MSR and added to auction volumes the following year. The ongoing revision of the EU ETS reinforces the role of the MSR: from 2023 onwards the number of allowances held in the reserve will be limited to the auction volume of the previous year and holdings above that amount will lose their validity.[53]

In the UK, NZ, California and RGGI systems, the ETSs apply a price-based mechanism to intervene and stabilize the market. These mechanisms include an Auction Reserve Price (ARP), which, as indicated above, sets a price floor over the price at which an allowance can be sold at the auction. Price floors do not prevent market participants from trading allowances in the secondary market for a lower price. For example, the price stabilization mechanism implemented by RGGI is voluntary for its member states and is called the "Emissions Containment Reserve" (ECR). The ECR is triggered if emission reduction costs are lower than projected – with a trigger price at $6.42 in 2022 with an anticipated increase by 7% every year thereafter.

Other mechanisms include a Cost Containment Mechanism (CCM) which enables relevant authorities to amend the distribution or volume of allowances to be auctioned in any one year if the carbon price exceeds specified limits. These limits are relative to historic carbon prices. This mechanism guards against sustained high price extremes in the ETSs, providing an avenue for intervention in limited and specific circumstances.

In the UK, if the CCM is triggered, the UK Treasury may authorize:

[53] https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/revision-phase-4-2021-2030_en

- Changes to the distribution of auctioned allowances within a calendar year.
- Increases to the volume of allowances to be auctioned in a given year by bringing auctioned allowances forward from future years.
- The release of up to 25% of the allowances held in the New Entrants Reserve [54]for auction in that calendar year. or
- The release of allowances from the market stability mechanism accounts for auction in that calendar year.

The RGGI states also have established a Cost Containment Reserve (CCR) which consists of a quantity of allowances in addition to the cap which are held in reserve. These are made available for sale at auction only if the allowance price would otherwise exceed a set trigger price ($13.91 in 2022). The CCR is replenished at the start of each calendar year and the trigger price is also increased by 7% per year going forward. California has also established an Allowance Price Containment Reserve (APCR), under which allowances are set aside into tiers for use if the price hits certain levels. In 2022, the Reserve Tier 1 and Tier 2 prices are set at $46.05 and $59.17 per allowance, respectively. California is also transitioning to a hard price ceiling of $65; an unlimited supply of allowances will be available at this maximum price.

In New Zealand, the CCR replaces a fixed price option to provide the government with more control over the number of NZ allowances (NZUs) available to the market, as there is a limit on NZUs available through the reserve. This limit is part of the overall limit on allowances supplied into the scheme. In addition, since 2009, the NZ ETS has had a de facto price ceiling known as the fixed price option (FPO). The FPO allows NZ ETS participants to pay $35 per ton of CO_2 to the government instead of purchasing units from the secondary market. This provides participants with a guaranteed maximum compliance cost. ETS participants can only use the FPO when they have a surrender or repayment obligation. The FPO does not create NZUs that can be traded in the market, and there is no limit on the number that can be purchased. When FPO units are purchased, it indirectly adds to the supply of NZUs in the market because its use means that other NZUs will not be surrendered.

Finally, in China, upper and lower caps are applicable to the trading price for a specific trading day – determined by reference to the closing price on the previous trading day. However, the regional schemes' mechanisms are different from that of the national schemes. In Guangdong and Hubei, some allowances are held back to be released into the market and apply downward pressures. The mechanism for the national scheme currently does not have a comparable feature where reserves are set aside for market stability purposes; instead, there are provisions for competent authority to respond to abnormal fluctuation in trading prices through open market operations and making adjustments to rules related to the use of China Certified Emission Reduction (CCER).[55]

3.3. ETS Registries

To guarantee the integrity of compliance carbon markets, many jurisdictions have set up ETS registries used to help ensure that all allowances issued as part of the schemes are properly accounted for and double counting is avoided. They track ownership of allowances held in

[54] The New Entrants Reserve is a set aside of allowances, reserved for new operators or existing operators who have significantly increased capacity.

[55] NewsletterAddin (linklaters.com)

electronic accounts, much like a bank record all of its customers and their accounts and transactions.

In doing so, registries contribute to enhanced market monitoring and data quality by keeping track of the acquisition, transfer, retirement, and surrender of allowances. In addition, in some jurisdictions, information on program data and market activity is accessible publicly, adding to transparency.

Normally, ETS registries record the accounts of the legal or natural persons (including governments) which are necessary to obtain and transfer allowances. They include the transactions between account holders, a list with the compliance companies, and the number of allowances allocated for free; and details of all verified CO_2 emissions and reconciliation of allowances surrendered.

Every significant ETS has a registry in place. In 2012, the European Commission established the Union Registry to ensure the accurate accounting of European allowances issued under the EU ETS. In the UK, allowances are held in the UK ETS Registry administered by the Environment Agency. In the RGGI program, the acquisition, transfer, retirement, and surrender of allowances is tracked on the RGGI CO_2 Allowance Tracking System (RGGI COATS) platform. In the California program, a web-based reporting tool called the California Electronic Greenhouse Gas Reporting Tool (Cal e-GGRT) manages the reporting, certification, submission, and verification of emissions data. All entities participating in the California program are also required to have an account with the Compliance Instrument Tracking System Service (CITSS). CITSS tracks compliance instruments from the point of issuance by jurisdictions, to ownership, transfer, and finally retirement.

3.4. Transparency in primary markets

As noted above, these registries play an important role in promoting market integrity and allowing authorities to monitor the functioning of compliance markets. However, they can also play an important role in promoting transparency to the public on activities in primary markets.

For example, in the EU an essential part of the registry is the EU Transaction Log, which automatically checks, records, and authorizes all transactions that take place between accounts in the Union Registry. All information contained in the Union Registry is confidential, but this information becomes freely accessible to the public after three years. The UK also has similar arrangements.[56]

In the RGGI, an independent monitor, Potomac Economics, undertakes a quarterly market monitoring public report designed to shed light on the holdings of CO_2 allowances and allowance derivatives and the demand for these allowances with the aim of identifying firms that might acquire a position that raises competitive concerns.

In California, the authority provides a wide range of information on its cap-and-trade program. The available information ranges from the verification of greenhouse gas emissions through allocation, offsets, compliance, auction announcements and results, use of auction proceeds, market data, and enforcement. Among the publicly available reports are allowance allocation summaries, offset credit issuance tables, summaries of compliance instruments held in CITSS, and summaries of the transfers of allowances and offsets between entities in CITSS.[57]

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56 https://reports.view-emissions-trading-registry.service.gov.uk/ets-reports.html

57 https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program

In New Zealand, public reports also detail the emissions and removal of greenhouse gas as reported by participants for their registered activities in the NZ ETS. This information is published in the ETS Participant Emissions report that covers the reporting period for the reporting year from 1 July to 30 June. Publication of this report was introduced in 2020 to help improve transparency of the ETS. In addition to this public reporting, information about each NZ ETS carbon auction is published by the NZX in the form of an information sheet providing key statistics about price, participants, units sold, etc. (NZX Managed Auction Service (etsauctions.govt.nz)). This information sheet also compares some secondary market price information against the auctions clearing price. Information about secondary market trading comes from CommTrade, an online commodity pricing facility which allows registered users to post bids and offers as an extension of Jarden's existing over-the-counter commodity business.[58] Information regarding transaction trends, volumes, transfers, privately held units and historical data is also published by the Environmental Protection Authority from the ETS register. These are aggregate transaction trends for the domestic market.

[58] Jarden is a private company that provides financial services and broking services for retail and wholesale investors and market investment banking.

Chapter 4 – CCMs Functioning at Secondary Market Level

Once allowances have been distributed, via free allocation and/or auctioning mechanisms, entities can either use secondary markets for further trading or bank any surplus they have for future use. The "banking" option is, however, sometimes subject to holding limits to help prevent abuse in the market – as is the case in California. Indeed, holding limits incentivize entities to reduce emissions early on, while leaving some flexibility in managing future business needs.

Participants use secondary markets, where spot allowances are resold, to purchase further allowances or sell their own surplus depending on their needs and objectives. Participants may also use derivatives markets to manage price risks associated with allowances. The derivatives market for emission allowances consists of futures on emission allowances with various maturities; and options on futures on emission allowances.[59] Physically-settled futures contracts, if held to expiry, will result in physical delivery of allowances or offsets within the relevant accounts. Some schemes only allow trading of spot products, as is the case with the Chinese national ETS for example.[60]

Participation in the secondary markets still includes compliance entities but appear to be broader than in primary markets. Unsurprisingly, financial participants play a key role; notably as intermediaries allowing compliance entities to fulfil their regulatory obligations, by facilitating the trading of emission allowances in spot and derivative markets. There appears to be an increase in participation by types of financial participants beyond banks, such as high frequency traders or hedge funds who can assist with market depth and liquidity without holding significant positions in the market. Several examples across jurisdictions demonstrate this trend. In Europe, for example, a recent report[61] by ESMA shows an increase in the types of participants in the EU, as highlighted in chart 5 below. In the US, RGGI´s program monitor has identified the increased participation from financial investors and passive investment funds in derivatives markets. For example, The KraneShares Global Carbon ETF tracks most globally traded carbon futures contracts and uses the IHS Markit's global carbon index as a pricing benchmark.[62] These types of investment funds also exist in other jurisdictions, albeit in a more limited manner at this stage. However, some jurisdictions, such as the China national ETS, appear to only allow compliance entities to trade, at least in the initial phase of their schemes.[63]

59 https://www.isda.org/a/soigE/Role-of-Derivatives-in-Carbon-Markets.pdf

60 https://lpscdn.linklaters.com/knowledge/-/media/digital-marketing-image-library/files/06_ckp/2021/august/210819_llzs_china-launches-its-first-national-carbon-emission-trading-scheme.ashx?rev=425b463c-770e-4785-95a6-968d39d8d059&extension=pdf

61 https://www.esma.europa.eu/sites/default/files/library/esma70-445-38_final_report_on_emission_allowances_and_associated_derivatives.pdf

62 https://kraneshares.com/krbn/

63 https://chinadialogue.net/en/climate/the-first-year-of-chinas-national-carbon-market-reviewed/

Chart 5: Participants in EU carbon markets

Average number of position holders on EUA futures, per category of counterparties, on EEX (source: EEX weekly position reports)

EEX	Compliance Entities and Other Non-Financials	Funds and Other Financials	Investment Firms	Total
2018	38	0	10	48
2019	44	0	16	60
2020	56	0	16	72
2021	67	1	24	92
2022	63	0	23	86

** Data until 31 December 2022*

Increase between average 2018 and average 2022 *	65.8%	0.0%	130.0%	79.2%
Increase between average 2021 and average 2022 *	-6.0%	-100.0%	-4.2%	-6.5%

Average number of position holders on EUA futures, per category of counterparties, on ICE (source: ICE Futures Europe and ICE Endex weekly position reports)

ICE	Compliance Entities and Other Non-Financials	Funds and Other Financials	Investment Firms	Total
2018	140	206	38	384
2019	154	248	41	443
2020	162	278	42	482
2021	305	362	102	769
2022	244	384	112	740

** Data until 31 December 2022*

Increase between average 2018 and average 2022 *	74.3%	86.4%	194.7%	92.7%
Increase between average 2021 and average 2022 *	-20.0%	6.1%	9.8%	-3.8%

Source: ESMA

The secondary market is important for several reasons. First, it provides the ability for non-compliance firms to access emission allowances. Second, it provides a hedging mechanism for firms and energy generators against future price volatility. Third, by allowing hedging of risks, it aids in the deepening of market liquidity in such products. Fourth, it signals a price that allows for firms to make more informed investment decisions on their carbon output.

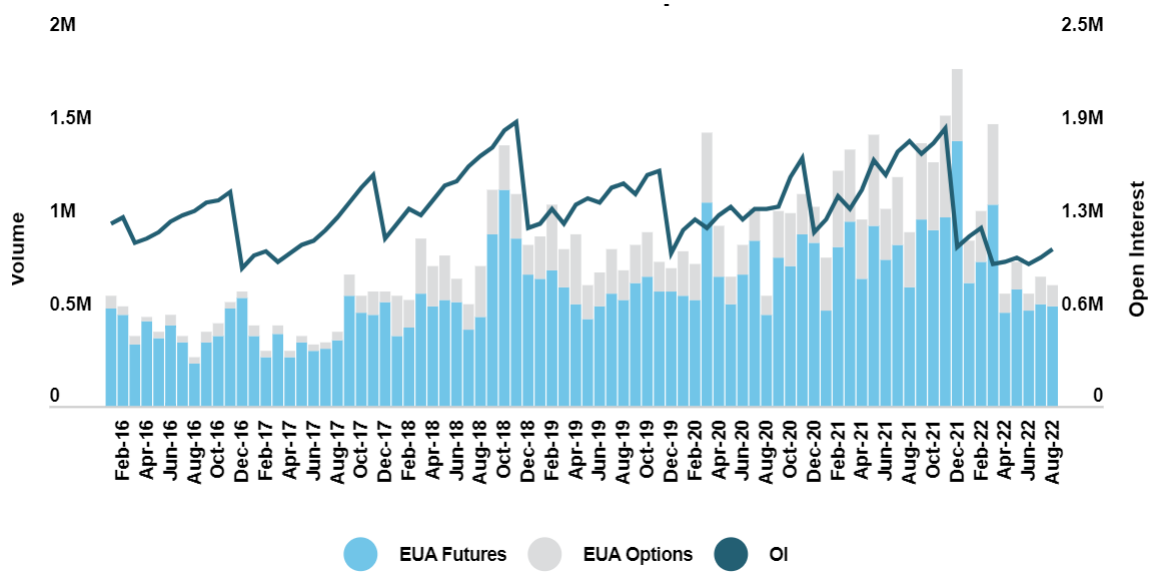
4.1. Trading activity in secondary markets

Trading in the secondary markets can be done on-exchange or over-the-counter (OTC). Both exchange-traded products and OTC contracts are an essential feature of financial markets generally, although the safeguards in terms of transparency, integrity and risk-management are generally higher on-exchange compared to OTC markets.

In the EU, trading takes place on three venues: EEX (DE), ICE Endex (NL) and Nasdaq Oslo (NO). All derivatives have a standardized contract size of 1,000 allowances (i.e., 1,000 tons of CO_2).[64] OTC trading appears to be limited[65] unlike in other markets such as New Zealand where much of the trading appears to take place OTC.

In the UK, ICE Futures Europe hosts secondary trading on its market in both UK emission allowance (UKA) futures and UKA daily futures.[66] In the US, several exchanges, including ICE Futures, CME, and Nodal Exchange, offer futures and options contracts on California carbon allowances (CCAs), California offsets, and RGGI allowances. In addition, securities exchanges list and trade exchange-traded funds (ETFs) with exposure to carbon allowances or offsets. Futures and options markets provide interesting insights into how secondary markets are developing. Indicators of growth are volumes traded and open interest, which are outlined below. For EUA contracts, there has been a consistent increase in the volume traded in both options and futures contracts of this asset over the last five years. While there is seasonality in the open interest, the trend is clearly upwards.

Chart 7: EUA Futures and Options



Source: ICE Group

64 https://www.esma.europa.eu/sites/default/files/library/esma70-445-7_preliminary_report_on_emission_allowances.pdf

65 https://www.esma.europa.eu/sites/default/files/library/esma70-445-38_final_report_on_emission_allowances_and_associated_derivatives.pdf

66 Whilst there is no spot contract listed, the UKA daily futures act in a very similar capacity to a spot contract through end of day delivery.

Similarly, the trading in derivatives markets in North America CO_2 markets has seen a consistent increase since 2016, across both the California and RGGI schemes. Futures and options trading volumes have seen a four-fold increase, while open interest, in aggregate, has increased three-fold (from 2016 to Dec 2021). As reported by Potomac Economics, increased futures trading and open interest has coincided with increasing participation of money managers and swap dealers in the futures market.[67]

Chart 9: North America Contracts 9:

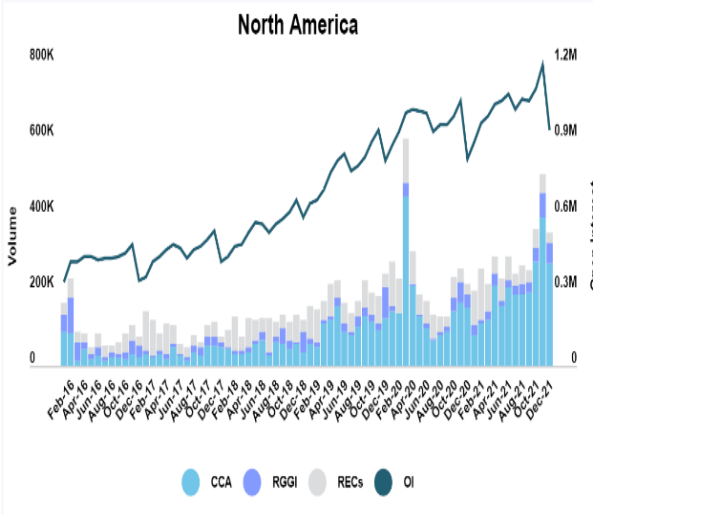
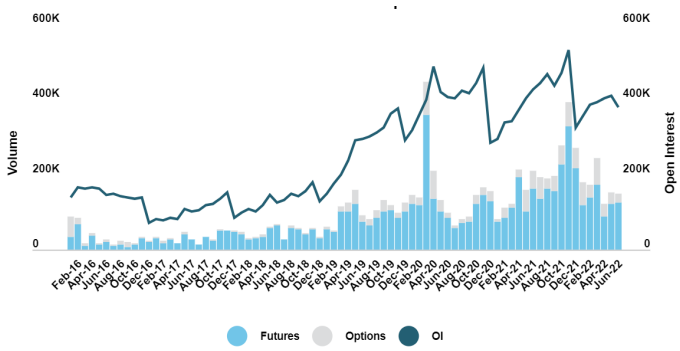


Chart: 10: CCA Futures and Options

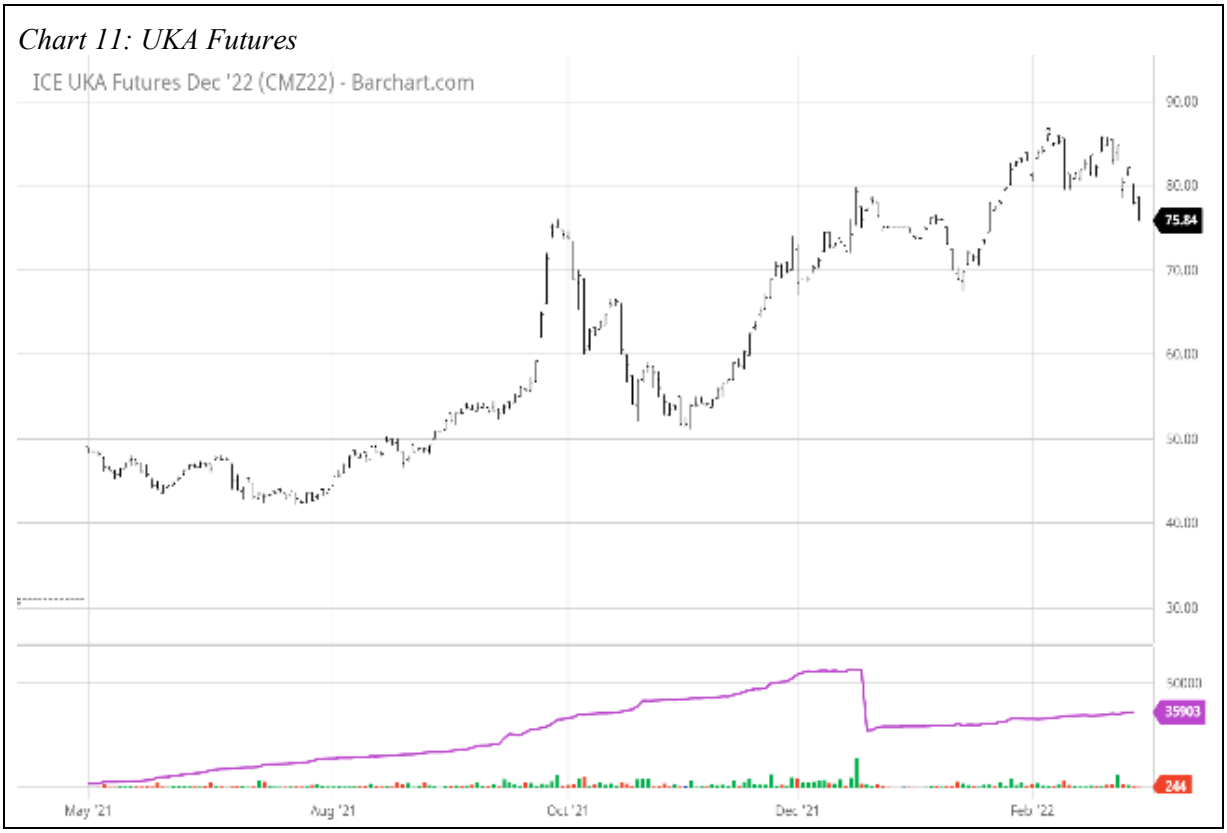


Source: ICE Group (https://www.theice.com/microsite/usenvironmentalmonthlymarketreport)

Since its launch, the secondary market pricing mechanism in the UK has been functioning well through ICE futures contracts. Options trading in UK allowances were launched in October 2022. This can be seen in Chart 11 which show that the volume and open interest in UKA contracts has been increasing since the markets' inception.

[67] Potomac Economics (2022): report on the secondary market for rggi co_2 allowances: fourth quarter 2021

Chart 11: UKA Futures

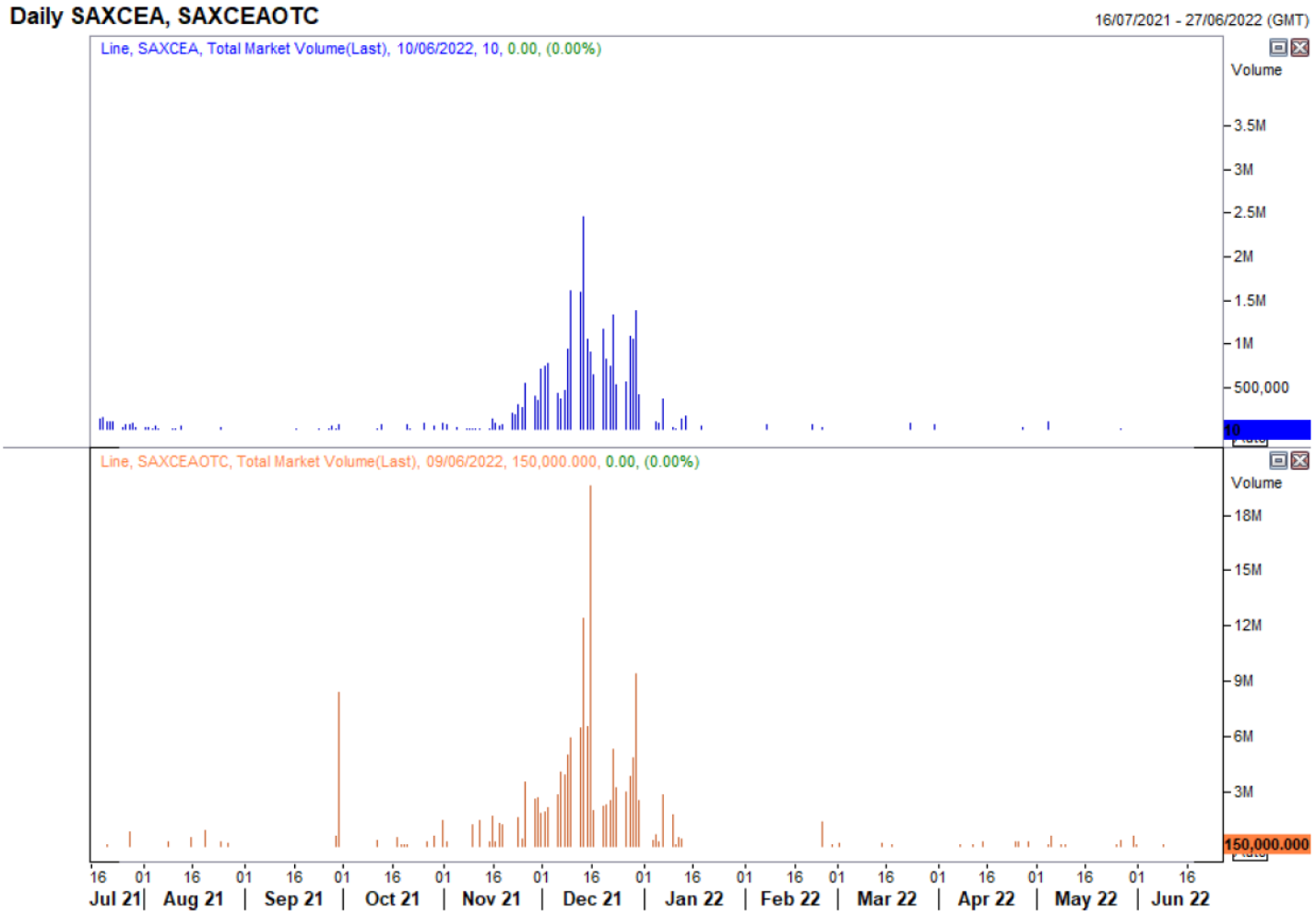


Source: ICE Group (https://www.theice.com/microsite/usenvironmentalmonthlymarketreport); barchart.com

In China, the national market is relatively new. While it was announced in 2017, it officially launched in January 2021 when the Chinese Ministry of Ecology and Environment (MEE) published the policy documents underpinning the functioning of the market. Trading commenced in July 2021 on a platform operated by the Shanghai Environment and Energy Exchange, with a temporary registry of transactions and holdings established under the China Hubei Carbon Emissions Exchange. At this stage, it is worth noting that there is currently no derivatives market for the national scheme, with legislation currently only allowing spot trading.

The national Chinese market also operates mostly OTC, as can be seen from the chart below, with volumes of OTC trading reaching 83% of total trades in 2021. Indeed, 148 million tons were traded OTC out of the 179 million tons traded.

Chart 12: China national carbon market on-screen and OTC trading volumes in tonnes

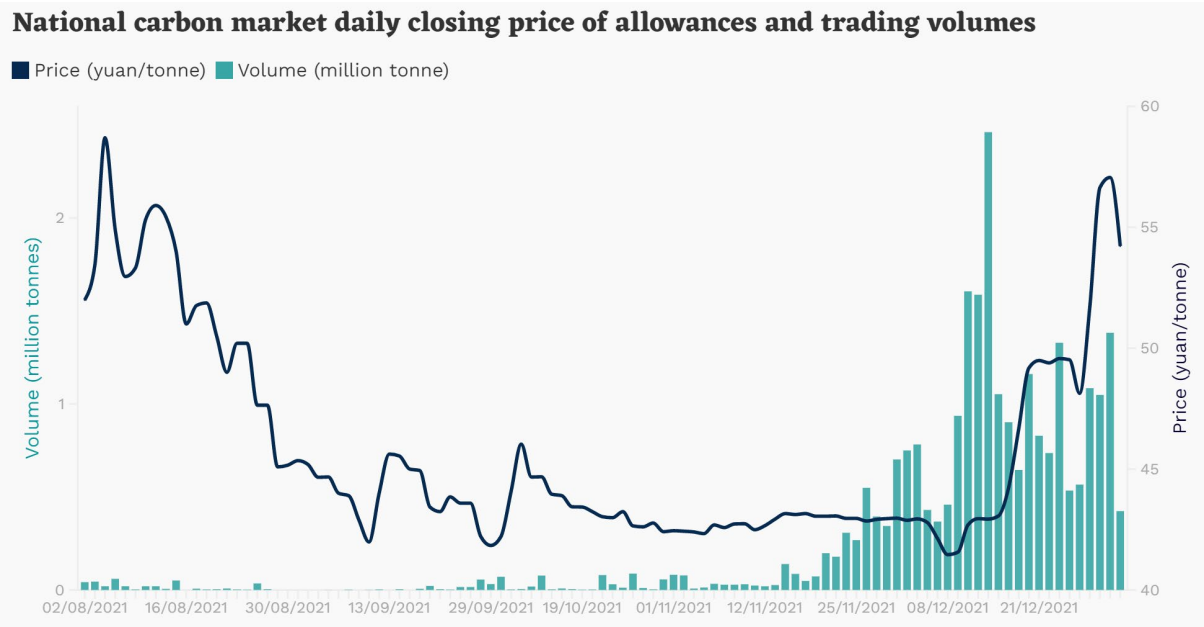


The mostly OTC market – and the trading pattern – may be explained by the fact the national Chinese ETS only allows participation by compliance entities at the moment. These compliance entities are big utilities companies which are likely more willing to trade near final compliance dates hence the spike in trading towards the end of the year.[68] Indeed, as these entities received their allowances gradually from the MEE over the course of the year, some compliance entities may have realized towards the end of the year that they were going to face a shortage, thereby searching for additional allowances. Available supply was limited, as most surplus holders did not want to part with their extra allowances, thereby leading to an increase in the price of allowances as can be seen from the chart below.[69]

[68] https://www.refinitiv.com/perspectives/market-insights/one-year-in-chinas-national-emission-trading-system/

[69] The first year of China's national carbon market, reviewed | China Dialogue (https://chinadialogue.net/en/climate/the-first-year-of-chinas-national-carbon-market-reviewed/)

Chart 13: National carbon market daily closing prices of allowances and trading volume



Source: Refinitiv

Chapter 5 - Regulatory Frameworks applicable to compliance carbon markets

The legal classification of emission allowances within each jurisdiction is important as it has consequences for the rights that a holder may assert over the allowances in terms of the security interests they hold, their treatment for tax or accounting purposes, upon insolvency and installation closure, or their coverage as financial instruments.[70] On the other hand, the regulatory classification will indicate which type of regulatory framework may be applicable for their oversight.

The legal nature and regulatory categorization of carbon emissions allowances varies across jurisdictions and their specific regulatory frameworks. The legal nature of carbon emission allowances refers to the fundamental legal characteristics of these instruments. In some jurisdictions for example, carbon emission allowances are considered property rights that can be bought, sold, and traded on markets, and in others they are considered administrative rights.

On the other hand, the regulatory categorization of carbon emission allowances refers to how these instruments are classified and regulated by government authorities. Carbon emission allowances can be categorized in a few different ways, such as tradable instruments, financial instruments, or commodity instruments.

By way of example, in the European Union, while emission allowances classify as financial instruments for the purpose of their regulatory categorization, under Article 11(5) of the EU ETS Registry Regulation, emission allowances accounts in the Union Registry are governed by the laws of the EU Member State of their administrator, meaning their legal nature is left at the behest of the country of their administrator. In France, for example, these allowances classify as intangible property rights while in Italy the doctrine is divided between immaterial rights and administrative rights. This is relevant for issues such as the nature of the rights in the allowances held in the Union Registry account.[71] In the UK, allowances in the UK ETS are classified as financial instruments for regulatory purposes.

Based on a survey by IOSCO of its members [participating in the IOSCO Sustainable Finance Task Force], it seems that the regulatory categorization of carbon allowances is mainly as financial instruments, whether commodities, such as in Quebec and the US regional ETSs, securities, such as in the UK, or a new type of financial instrument, such as in Abu Dhabi Global Market. In some cases, for example in Japan, carbon allowances are not considered financial instruments (although can be restricted when handled by financial institutions), and many other jurisdictions still have not yet defined or categorized carbon allowances.

[70] https://www.ecologic.eu/sites/default/files/publication/2021/ML0219546ENN-en.pdf

[71] https://op.europa.eu/en/publication-detail/-/publication/9d985256-a6a9-11e9-9d01-01aa75ed71a1

5.1. IOSCO Principles applicable to CCMs.

In many respects, secondary markets in cash compliance allowances and offsets operate similarly to commodities markets, suggesting the same comprehensive oversight that promotes transparency and integrity in those markets could do so for compliance carbon markets as well – including oversight at the level of derivatives and securities products based on carbon credits. On that basis, many existing IOSCO principles that focus on these objectives could be applied to these markets. Respondents to the consultation report were generally comfortable with this approach, although some suggested the bespoke characteristics of emission allowances, often framed through environmental legislation and issued in government-controlled primary markets, should be accounted for.

Nonetheless, IOSCO's Objectives and Principles of Securities Regulation relating to the regulator, enforcement, cooperation, and trading on secondary markets would appear to be an appropriate baseline for the oversight of these markets.[72]

As suggested by one respondent, the list below now includes additional principles to the ones initially selected for the consultation report. In addition, the IOSCO "Principles for the Regulation and Supervision of Commodities Derivatives Markets"[73] have been updated in accordance with the revision of these principles concluded in January 2023. This revision was conducted to ensure that IOSCO principles appropriately address the recent developments in the commodity derivatives markets. Finally, following that revision, new principles have been also added to the original list. These new principles refer mainly to data and market transparency, unexpected disruptions in the market, technological developments in commodity derivatives markets, and promotion of investor education and awareness.

Objectives and Principles of Securities Regulation	
Principles Relating to the Regulator	
1	The responsibilities of the Regulator should be clear and objectively stated.
2	The Regulator should be operationally independent and accountable in the exercise of its functions and powers.
3	The Regulator should have adequate powers, proper resources and the capacity to perform its functions and exercise its powers.
4	The Regulator should adopt clear and consistent regulatory processes
5	The staff of the Regulator should observe the highest professional standards, including appropriate standards of confidentiality.
6	The Regulator should have or contribute to a process to identify, monitor, mitigate and manage systemic risk, appropriate to its mandate
7	The Regulator should have or contribute to a process to review the perimeter of regulation regularly.
8	The Regulator should seek to ensure that conflicts of interest and misalignment of incentives are avoided, eliminated, disclosed or otherwise managed.
Principles for Self-Regulation	
9	Where the regulatory system makes use of Self-Regulatory Organizations (SROs) that exercise some direct oversight responsibility for their respective areas of competence, such SROs should be subject to the oversight of the Regulator and should observe standards of fairness and confidentiality when exercising powers and delegated responsibilities.

[72] https://www.iosco.org/library/pubdocs/pdf/IOSCOPD561.pdf

[73] https://www.iosco.org/library/pubdocs/pdf/IOSCOPD726.pdf

Principles for the Enforcement of Securities Regulation	
10	The Regulator should have comprehensive inspection, investigation and surveillance powers.
11	The Regulator should have comprehensive enforcement powers.
12	The regulatory system should ensure an effective and credible use of inspection, investigation, surveillance and enforcement powers and implementation of an effective compliance program.
Principles for Service Providers	
23	Other entities that offer investors analytical or evaluative services should be subject to oversight and regulation appropriate to the impact their activities have on the market or the degree to which the regulatory system relies on them.
Principles for Market Intermediaries	
30	There should be initial and ongoing capital and other prudential requirements for market intermediaries that reflect the risks that the intermediaries undertake.
31	Market intermediaries should be required to establish an internal function that delivers compliance with standards for internal organization and operational conduct, with the aim of protecting the interests of clients and their assets and ensuring proper management of risk, through which management of the intermediary accepts primary responsibility for these matters.
32	There should be procedures for dealing with the failure of a market intermediary in order to minimize damage and loss to investors and to contain systemic risk.
Principles for the Secondary Market	
33	The establishment of trading systems including securities exchanges should be subject to regulatory authorization and oversight.
34	There should be ongoing regulatory supervision of exchanges and trading systems which should aim to ensure that the integrity of trading is maintained through fair and equitable rules that strike an appropriate balance between the demands of different market participants.
35	Regulation should promote transparency of trading.
36	Regulation should be designed to detect and deter manipulation and other unfair trading practices.
37	Regulation should aim to ensure the proper management of large exposures, default risk and market disruption.
Principles Relating to Clearing and Settlement	
38	Securities settlement systems, central securities depositories, trade repositories and central counterparties should be subject to regulatory and supervisory requirements that are designed to ensure that they are fair, effective and efficient and that they reduce systemic risk.

Similarly, a number of IOSCO's Principles for the Regulation and Supervision of Commodity Derivatives Markets could be of use for compliance markets, in particular those focused on transparency, market surveillance, collection of secondary market trading information (both OTC and on-exchange), and enforcement as can be seen in the extract below:[74]

[74] https://www.iosco.org/library/pubdocs/pdf/IOSCOPD689.pdf

Principles for the Regulation and Supervision of Commodity Derivatives Markets	
Contract Design Principles	
Accountability	Relevant Market Authorities should establish a clear framework of criteria or procedures as to design and review of commodity derivatives contracts, ensuring that the relevant Market Authority retains powers to address or vary the provisions of contracts, which produce manipulative or disorderly conditions. Relevant Market Authorities should be accountable for compliance with statutory and/or self-regulatory standards on a continuous basis.
Principles for the Surveillance: Appropriate framework and resources	
Framework for Undertaking Market Surveillance	Relevant Market Authorities should have a clear and robust framework for conducting market surveillance, compliance and enforcement activities and there should be oversight of these activities. A market surveillance program should take account of a trader's related derivatives and physical market positions and transactions, including the impact of ETPs, where relevant. Market surveillance programs should be supported by sufficient resources, access to physical market data and analytical capabilities.
Monitoring, Collecting and Analyzing Information.	Relevant Market Authorities should develop, employ and maintain methods for monitoring of trading activity on the markets they supervise, collecting needed information and analyzing the information they collect that are efficient and suitable for the type of market being supervised. Effective monitoring of orders and electronic transactions requires real-time monitoring capabilities, supported by automated systems that detect trading anomalies. Monitoring, collection and analysis should also focus on intra-day trading.
Collection of Information on On-Exchange Transactions	In respect to on-exchange commodity derivatives transactions, a Market Authority should collect information on a routine and regular basis on: i) pricing of contracts throughout the trading day in real time; ii) daily transactional information including time and date of trade, commodity contract, delivery month, expiry date, buy/sell, quantity, counterparties to the contract, and price of the contract; iii) daily reports of end-of-day positions held by market intermediaries (both "whole firm" and by individual trader) and by other market participants, where the size of the position is above a specified level ("large position"). Information collected should permit a Market Authority to identify each position holder (by name or code) down to the first customer level, and the size of position, by contract month, for each position holder; The Market Authority should have the capability to aggregate position holder information promptly in order to identify positions under common ownership or control; and iv) where appropriate, warehouse stocks or other deliverable supply.
Principles to Address Disorderly Commodity Derivatives Markets	
Intervention Powers in the Market	Relevant Market Authorities should have, and use, effective powers to intervene in commodity derivatives markets to prevent or address disorderly markets and to ensure the efficiency of the markets. These powers should include the following: 1) Position Management Powers, Including the Power to Set Position Limits – Relevant Market Authorities should have and use formal position management powers, including the power to set ex-ante position limits, particularly in the delivery month. These should necessarily include position management powers that: i) Establish a trader's automatic consent to follow an order of the relevant Market Authority when that trader's position reaches a defined threshold size or any size,

	which the relevant Market Authority considers prejudicial to orderly market functioning, taking into account all relevant circumstances. They should also require such a trader to comply with the relevant Market Authority's order, either not to increase a position or to decrease a position; and ii) Authorize a relevant Market Authority to place ex-ante restrictions on the size of a position a market participant can take in a commodity derivatives contract (i.e., position limits). 2) Other Discretionary Powers – Relevant Market Authorities should also have the powers to employ any of the following measures, as appropriate to address market disruption or the perceived threat of such disruption or to assist market surveillance efforts: i) the imposition of price movement limits; ii) calling for additional margin, either from customers or from clearing members on behalf of their clients; iii) ordering the liquidation or transfer of open positions; iv) suspending or curtailing trading on the market (e.g., trading halts and circuit breakers); v) altering the delivery terms or conditions; vi) cancelling trades; vii) requiring owners of positions to specify delivery intentions; and viii) requiring traders to disclose related OTC derivatives or large physical market positions.
Review of Evolving Practices	Relevant Market Authorities should have or contribute to a process to review the perimeter of regulation to ensure that they have the power to address evolving trading practices that might result in a disorderly market. Exchanges and self-regulatory organizations play a critical and complementary role with governmental regulators in identifying such practices.
Unexpected Disruptions in the Market	Relevant Market Authorities should have a process to respond to unexpected disruptions in commodity derivatives markets and the power to intervene, as necessary, in order to restore orderly markets in the event of an unexpected disruption and ensure market participants have a process and adequate plans to address unexpected disruptions.
Principles for Enforcement and Information Sharing	
Rules and Compliance Programs	Relevant Market Authorities should have rules, compliance programs, sanctioning policies and powers to prohibit, detect, prevent and deter abusive practices on their markets, including manipulation or attempted manipulation of the market. The rules and compliance programs should take account of the whole position of the market participant (i.e., all positions under common ownership and control). There should be clarity as to what constitutes manipulative, abusive conduct or other prohibited conduct. Specific practices which relevant Market Authorities should seek to detect and prevent include, among others: i) causing, or attempting to cause, artificial pricing in the market; ii) creating a false or misleading appearance of active trading; iii) disseminating false or misleading information in respect of the market or conditions that affect the price of any commodity derivatives contract; iv) creating, or attempting to create, a corner or squeeze, in which an abusive controlling position is accumulated in the physical and/or futures or OTC markets, forcing those holding short positions to settle their obligations, by purchase or offset or otherwise, to their detriment; v) abuse relating to customer orders; vi) "wash trades", involving no change of beneficial ownership or economic

	purpose; vii) collusive trades, which seek improperly to avoid exposure to the pricing mechanism of the market; viii) violation of applicable position limits; ix) concealment of a position holder's identity and, x) misuse of information
Framework for Addressing Multi-Market Abusive Trading and Powers and Capacity to Respond to Market Abuse	Relevant Market Authorities should ensure that the regulatory framework for market surveillance and enforcement within a jurisdiction should be structured to provide for active and coordinated detection and enforcement action against manipulative or abusive schemes that might affect trading on multiple trading venues and OTC markets, as well as the underlying physical commodity markets. Relevant Market Authorities should have adequate powers and capacity to investigate and prosecute actual or suspected market abuse, including attempted manipulation.
Framework for Addressing Multi-Market Abusive Trading and Powers and Capacity to Respond to Market Abuse	Relevant Market Authorities should ensure that the regulatory framework for market surveillance and enforcement within a jurisdiction is structured to provide for active and coordinated detection and enforcement action against manipulative or abusive schemes that might affect trading on multiple trading venues and OTC markets, as well as the underlying physical commodity markets. Relevant Market Authorities should have adequate powers and capacity to investigate and prosecute actual or suspected market abuse, including attempted manipulation.
Powers over Market Members and Non-Market Members	
Disciplinary Sanctions Against Market and Non-Market Members	The relevant Market Authority should have and use effective powers to discipline its members or other authorized market participants if an abusive practice has occurred in the market. There should be clarity as to the types of disciplinary actions which can be taken. Relevant Market Authorities should have power to take action against non-members of regulated commodity derivatives markets or other market participants if they have engaged in abusive or manipulative practices or are suspected of doing so. Relevant Market Authorities may require contractual relationships between members and customers that enable action to be taken. In addition, relevant Market Authorities should be able to intervene, or cause the exchange to intervene, in the market to address or to prevent an abuse by non-members, using appropriate measures - through members - such as for example by raising the level of margin, imposing trading limits and liquidating positions, as well as removing trading privileges. Any intervention action should be timely.
Information Sharing	Relevant Market Authorities and physical market operators should cooperate with one another, both domestically and outside the jurisdiction, to share information for surveillance and disciplinary purposes, including establishing arrangements that allow them to share information on large exposures in linked markets and on physical commodity supplies for these markets. These arrangements should take account of (as applicable): i) The Exchange International Information Sharing Memorandum of Understanding and Agreement (Exchange International MOU) and the Declaration on Cooperation and Supervision of International Futures Exchanges and Clearing Organizations (Declaration), which facilitate the identification of large exposures by firms that could have a potentially adverse effect on multiple markets; ii) The IOSCO Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMOU); and

	(iii) Guidance issued by IOSCO in respect of information sharing, such as IOSCO's Principles Regarding Cross-Border Supervisory Cooperation, Report on Multi-jurisdictional Information Sharing for Market Oversight, and Guidance on Information Sharing. Information sharing to facilitate heightened surveillance is warranted where physical commodity derivatives contracts trade on different exchanges and are linked economically, such as where one contract's settlement price is determined by reference to the settlement price of the other contract.
Markets Principles on Technological Developments in Commodity Derivatives Markets	
Direct Access	Where direct access to commodity derivative markets is offered or permitted, relevant Market Authorities should ensure that a clear framework, including appropriate policies and controls, is in place to facilitate such direct access by market participants, including non-financial firms.
Role of High Frequency Trading and Algorithmic Trading in Commodity Derivatives Markets –	Relevant Market Authorities and regulated trading venues should have in place a clear framework of policies and controls to analyze the impact of high frequency and algorithmic trading in commodity derivative markets.

5.2. Jurisdictional-level regulatory frameworks

At the national level, some jurisdictions classify both spot carbon emission allowances and derivatives on carbon emission allowance as financial instruments meaning they fall within the scope of securities regulation in those jurisdictions – including with regards to market abuse and money laundering. This is for example the case in the EU, the UK and in Australia where both spot and derivatives markets are regulated.

However, this is not the case in all jurisdictions. For example, in New Zealand, the Financial Markets Authority does not currently have responsibility or remit for any aspect of the New Zealand ETS. Under domestic financial markets legislation, NZUs are not financial products, and primary and secondary markets where NZUs are issued and traded respectively are not regulated as financial product markets.[75]

In addition, it is worth noting that there tends to be fragmentation of oversight where this oversight exists. For example, in the UK, while the UK ETS Regulator is responsible for enforcing compliance with the UK ETS Regulations, including operational functions such as issuing and ensuring compliance with permits (for installations) and emissions plans (for aviation), it is the UK FCA which is responsible for (i) authorization of the recognized investment exchange that could be appointed as an auction platform, (ii) supervision and enforcement of the recognized auction platform (the auction platforms are appointed by the Department of Business, Energy and Industrial Strategy (BEIS)) and (iii) supervising the trading of emissions – both on primary markets and secondary markets. The UK FCA and the UK ETS Regulator regularly coordinate actions.

[75] It is however worth noting that the Ministry for the Environment (MfE) has ongoing policy work looking at ways to improve the market governance framework for the New Zealand Emissions Trading Scheme in the primary and secondary markets. A consultation paper outlining the governance framework options can be found at https://consult.environment.govt.nz/climate/designing-a-governance-framework-for-the-nz-ets/supporting_documents/MG%20consultation%20document%20%20FINAL.PDF.

In the EU, the division of responsibility in the carbon market is also split amongst different authorities at EU and Member State level. Rules governing primary markets (issuance) are governed at EU level, while the oversight of secondary markets (e.g., supervision of trading venues, market abuse, regulatory reporting of positions and transactions) falls under the remit of national competent authorities. In the US [and in Canada], there is no regulated market in place at the federal level relating specifically to carbon allowances or offsets, whether in the primary or secondary cash markets.

Nevertheless, independent of the nature of the regulatory body, regulatory frameworks will typically seek to address concerns such as (i) good conduct rules, including conflicts of interest, (ii) potential lack of transparency, oversight and monitoring of trades, and (iii) fraud, insider trading and price manipulation. Below, we explore the type of regulatory framework that may be beneficial to compliance markets globally, building upon existing frameworks, to mitigate these risks.

5.2.1. Rules of general good conduct, such as the prevention of conflicts of interest

In the US, the RGGI and the California ETS are subject to regulatory requirements including participant registration requirements and accountability provisions.

Both EU and UK regulatory requirements govern the relationship between market intermediaries and their clients trading in emission allowances covering, amongst other things, client categorization, conflicts of interest, and best execution. They also set standards for trading venues in the operation of the secondary trading of financial instruments to ensure that markets function well and have high standards of integrity.

Trading venues are typically also required to have effective arrangements, resources and procedures to monitor the compliance of members and participants with their rules. This includes monitoring by the venue of orders sent, cancellations and the transactions undertaken by their members.

5.2.2. Rules to promote transparency, oversight and monitoring of trades

Jurisdictions have typically created rules on both position and transaction reporting to increase both transparency to the market and better oversight by the regulator. In addition, to enhance regulatory clarity and predictability, some existing ETSs have set out transparency requirements about (i) the overall cap of carbon emissions the government intends to impose; (ii) the number of allowances that it intends to give out for free; (iii) the amount of allowances that it intends to auction; and (iv) the auctioning mechanism.

In the EU, compliance markets are subject to:

- Transaction reporting to a competent authority (financial markets supervisors) for emission allowances and their derivatives, whether they are executed on-venue or OTC. Transaction reporting covers both auctions and secondary markets. Those highly granular reports are a key source of information used by the EU competent authorities for their market surveillance activities and the enforcement of the market abuse regulation.
- Position reporting: Trading venues are required to comply with two sets of position reporting obligations: weekly position reporting setting out the aggregate positions held by the different categories of persons for the different emission allowances or their

derivatives[76] with various breakdowns (long versus short positions, hedging versus non-hedging positions). Weekly position reports are public. In addition, trading venues must provide their supervisory authority with a daily breakdown of the positions held by all persons on their venue; hence participants must report the details of their own positions to the venue, including that of their clients.[77]

The requirements set out above for the EU are similar in the UK as UK financial services legislation is currently based on EU legislation that applied before the UK's exit from the EU. Under the UK ETS, trading on the secondary market is subject to the transparency and reporting requirements. These include transaction reporting pre- and post-trade transparency requirements; position reporting; and Suspicious Transaction and Order Report (STOR) requirements and reporting of trades to Trade Repositories. The structure of the rules applying to emission allowances under these requirements are the same as for other financial instruments, although some of the detail, particularly on pre- and post-trade transparency (in terms of thresholds for waivers from pre-trade transparency and deferrals of post-trade transparency), is tailored to the specifics of emission allowances.

5.2.3. Rules to prevent fraud, insider trading and price manipulation.

Generally, jurisdictions have rules in place to avoid market abuse.

In the EU and the UK for example, the MIFID II/MIFIR and the MAR regimes apply to CCMs – both spot and derivatives segments. The Market Abuse regime prohibits insider dealing, unlawful disclosure of inside information and market manipulation. This applies to behavior in both the primary and the secondary market. Fundamentally the regime is the same as that which applies to other financial instruments.

In the US, there is no federal regime in place for primary carbon credit markets. At a regional level, the California authority conducts market surveillance and analysis and works closely with an independent market monitor, Monitoring Analytics, to monitor the auctions and all holding and trading of compliance instruments for the program. Activities in related markets are also tracked and analyzed and under the California scheme civil or criminal penalties can be imposed for manipulative or disruptive market practices, in addition to those otherwise applicable under federal law. States participating in RGGI have also established their own regulatory frameworks and oversight mechanisms for their respective programs. For example, Potomac Economics oversees the auctions and tracks the performance and efficiency of the RGGI allowance market. This includes (i) identifying attempts to exercise market power, collude, or otherwise manipulate prices in the auction and/or secondary market; (ii) making recommendations regarding proposed rule changes; and (iii) assessing whether auctions are administered in accordance with the noticed rules and procedures.

At the secondary market level, since the CFTC has broad enforcement powers to pursue manipulation of a commodity's price in interstate commerce, the agency would have the authority to bring actions against individuals or entities believed to be involved in the price manipulation of compliance market allowances or offsets. There would also be some authority on the part of the CFTC to obtain information on allowance holdings and the trading of traders that also hold positions in the futures markets. However, absent action by Congress, the CFTC does not have authority to routinely monitor secondary trading in spot markets for allowances or to create rules or regulations that would apply to these markets. Having said that, carbon

[76] These weekly position reports in commodity derivatives are centralised and made available on ESMA's website: https://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_coder58

[77] https://www.esma.europa.eu/sites/default/files/library/esma70-445-7_preliminary_report_on_emission_allowances.pdf

allowance or offset futures and options contracts traded on CFTC-regulated exchanges, such as CME, ICE Futures, and Nodal Exchange are under the CFTC's oversight and regulated in the same manner as any other derivatives contract traded on a designated contract market. The exchanges must comply with a number of core principles and rules ensuring that contracts are not readily subject to manipulation. The exchanges must monitor trading to prevent manipulation, price distortion, and disruptions of the settlement process, as well as adopt position limits or accountability levels for speculators, where necessary and appropriate. Exchange-traded carbon allowance and offset futures and options contracts are subject to speculative position limits. The US SEC also has broad authority over securities, including those that may be related to compliance market allowances or offsets, which can be used to deter and enforce against fraud, insider trading and price manipulation. SEC-regulated securities exchanges that list and trade exchange-traded products with exposure to carbon allowances or offsets are subject to SEC rules and federal securities laws regarding the prevention of fraudulent and manipulative acts, promoting just and equitable principles of trade, and protecting investors. Securities exchanges must enforce against their members these SEC rules and federal securities laws, as well as their own rules in this regard.

Chapter 6 - IOSCO Recommendations for Compliance Carbon Markets

The chapters above have sought to describe the characteristics of well-functioning compliance markets based on those currently in operation in jurisdictions where compliance markets have been established for a number of years. In addition, they highlight a series of potential challenges that jurisdictions seeking to introduce compliance markets may wish to consider as they look to implement their own frameworks.

With this objective in mind, the recommendations below, now in their final form, address issues around integrity and orderly functioning of CCMs.

The recommendations below are also intended to encourage the development of well-regulated CCMs globally, both primary and secondary markets. In that respect, they are intended to give jurisdictions a starting point to build sound and efficient CCMs and may be applied proportionally at different stages of market evolution, while drawing lessons learned from past experiences, from the regulation of more advanced markets.

Compliance carbon markets, unlike more traditional financial markets, are typically overseen by different types of entities who may regulate specific aspects of what – put together – constitutes compliance carbon markets. For example, many of the decisions relating to primary markets are typically controlled by legislative bodies while environmental policy agencies may also play a role in overseeing some activities in primary markets. And of course, financial regulators typically oversee activities in secondary markets – including spot and derivatives, and securities. The recommendations take into account this dynamic, which can vary across jurisdictions. In addition, the recommendations adopt some of the traditional requirements applied to securities and commodities markets, for example, with respect to market integrity and market transparency principles.

As such, in the spirit of encouraging the development of sound markets, IOSCO will address its recommendations to "relevant authorities" to allow jurisdictions and regulatory authorities the flexibility they may require consistent with their legal mandates as CCMs are established in their jurisdictions. Some of these recommendations address the functioning of primary markets, while others address the functioning of secondary markets; spot and derivatives; noting the IOSCO principles for commodities markets appear applicable to emission allowances markets.

Recommendation 1: Relevant authorities should increase predictability and transparency in primary market decisions.

Feedback to the consultation:

Respondents to the consultation were supportive of this recommendation. As a result, no change to the recommendation has been made for the purpose of this report.

Explanatory text:

Relevant authorities in charge of the primary market issuance of emissions allowances are encouraged to be transparent about:

- the overall cap of carbon emissions that the relevant emissions trading scheme intends to impose;
- the number of allowances that it intends to give out for free;
- the number of allowances that it intends to auction;
- the functioning of market stability mechanisms.
- whether carbon credits would be allowed to offset compliance obligations, and if yes, the requirements on the credits that could be used.
- Planned policy changes, such as, for example, the inclusion of new and/or additional sectors as well as the timing and sequence of these introductions or the introduction of potential pricing mechanisms.

Greater predictability will help market participants to plan strategically, to anticipate and manage associated risks (e.g., increased volatility), and to price them appropriately. Effectively communicating these key design characteristics as early as possible provides clarity to market participants, thereby mitigating risks to the stability of the markets over the long run as participants can anticipate and adapt to these changes without sudden frictions.

Recommendation 2: To foster fair, stable and competitive markets, relevant authorities in charge of primary market issuance should consider placing greater reliance on auctions over free allocation, where consistent with national authorities.

Feedback to the consultation:

There was general support for the idea that auctions are a more effective mechanism to motivate active participation by compliance participants in the CCMs, suggesting that auctions should be preferred to free allocation to the extent possible. Beyond the issue of auctions, one respondent suggested there was an important role for capital markets regulators and exchanges to promote greater disclosures by compliance entities as to determine the appropriate extent of allowances to be issued.

Explanatory text:

When choosing which allocation method to use in their jurisdictions, relevant authorities will likely consider the impact of the allocation method on compliance companies. Jurisdictions may continue to have free allocation for certain industries as they seek to avoid environmental and/or economic impacts on their territory, including as a result of loss of competitiveness. At the same time, jurisdictions will seek to ensure that any underlying abatement requirements are achieved. Certain jurisdictions may want to ensure that compliance entities must have sufficient incentives to abate their emissions. In that context, they may continue to choose alternative allocation methods, depending on national circumstances.

Certain participants in IOSCO's roundtable suggested that auctions are a more effective mechanism to motivate active participation by compliance participants in the CCMs, compared to free allocation. They consider that free allocation may decrease incentives for specific sectors to undertake reforms and may also lead those participants not to take part in secondary market activities.

Auctions have many benefits over free allocation. For example, auctions provide market liquidity and, in doing so, can facilitate price discovery including in the secondary markets.

IOSCO acknowledges that to increase reliance on auctions over free allocations, collateral risks, such as carbon leakage, should be addressed in parallel. Reducing the risk of carbon leakage is essential to allow relevant authorities to reduce the number of allowances allocated for free. Therefore, it is important to establish the necessary mechanisms to prevent carbon leakage, such as those explained in this report (e.g., CBAM mechanisms in the EU) but also to encourage international coordination. At the time of publication of this report, it is worth noting that some jurisdictions, such as the EU, have announced they would be gradually phasing out free allocation.

In addition, IOSCO recognizes that emerging markets might still require to use free allocation in the early phases to assist with cash flow management and to reduce backlash from participating entities.

As a result of the feedback received, IOSCO has not made changes to this recommendation.

Recommendation 3: Relevant authorities should set the frequency of auctions in a manner that is predictable, transparent, and consistent with the size of the market

Feedback to the consultation:

Recommendation 3 initially suggested that relevant authorities should consider setting frequent auctions. Several respondents noted that excessively frequent auctions could have the unintended consequence of drying out liquidity in the secondary market, which was seen as an important tool for price discovery. They also cited that some ETS with a relatively low auction frequency (e.g., quarterly) were nonetheless successful.

Therefore, they suggested a term different from "frequent" to emphasize focus on issues such as predictability, transparency and proportionality to the size of the market.

Explanatory text:
Predictable and regular auctions allow for better price formation and help provide more transparency to the market and can assist in reducing price volatility. Conversely, fewer auctions typically means more allowances are released during each auction and this can negatively impact liquidity in secondary markets.

In addition, regular auctions can let buyers avoid cash-flow constraints given they can spread their bids across auctions and mitigate the risk of any one participant gaining too much market power in the secondary market across one period. Finally, there were suggestions that regular auctions may decrease the risk of manipulation of the auction given the amount of allowances for sale at each individual auction is reduced.

Recommendation 4: When relevant authorities establish market stability mechanisms, any market intervention should be rule-based to allow for better predictability.

Feedback to the consultation:

Respondents to the IOSCO consultation on CCMs were supportive of this recommendation. One respondent however shared their view that volume and staging of the allocation of carbon allowances should ultimately be driven by supply and demand, suggesting there should not be a need for government-controlled market stability mechanisms to begin with.

Explanatory text:

As flagged in the report, emission allowance prices can be volatile, particularly as they are impacted by political decisions and other geopolitical considerations which influences the supply side of allowances.

While some level of volatility is beneficial to financial markets, long established compliance markets have experienced strong price variability as a result of exogenous shocks; for example, such as the price of other, linked, commodities (e.g., gas).

High levels of variability in prices can deter investment in compliance markets, thereby reducing the efficiency of their broader policy objectives. The aim of meeting decarbonization objectives is the reason why authorities have typically implemented market stability mechanisms. Indeed, this variability can – and has been – mitigated by market stability mechanisms across several jurisdictions as highlighted in the report.

Where government-controlled mechanisms exist, there are typically two types of mechanisms – price-based mechanisms and volume-based mechanisms as described in the report, although an ETS might use elements of both. Price-based mechanisms provide price signals and seek to anchor ex-ante controls, interactions, and responsiveness to economic forces. Volume-based adjustments, in contrast, seek to provide corrections for ex-post policy interactions or market shocks, based on judgements about market conditions. Volume-based adjustments might in some circumstances reduce the incentives for arbitrageurs to correct price inefficiencies and be subject to manipulation.

Recommendation 5: Relevant authorities should consider allowing a broad participation in primary markets, beyond compliance entities.

Feedback to the consultation:

Respondents to the IOSCO consultation were generally supportive of this recommendation but suggested the use of the term “non-compliance firms” could lead to confusion. As a result, while we have kept the intent of the recommendation, we have amended the text to remove the “non-compliance firms” language.

Explanatory text:

Allowing participation by a broader set of firms beyond compliance entities can facilitate market making, access to the markets, carbon financing, the provision of liquidity, and price formation mechanisms.

Nevertheless, relevant authorities should be mindful of and regularly monitor the potential impact of these non-compliance firms in auctions processes and how their participation may impact the price of allowances. In addition, any participation of non-compliance firms in primary markets should not interfere with the calculation of the volume and allocation of allowances available for compliance entities.

Recommendation 6: Relevant authorities should clarify the legal and regulatory classification of allowances in their jurisdiction.

Feedback to the consultation:

Respondents to the IOSCO consultation were generally supportive of this recommendation, with one respondent suggesting IOSCO should assist relevant authorities in harmonizing definitions across jurisdictions, as inconsistent classifications could impede market access and create cross-border challenges. Another respondent noted that a distinction may be required between the legal nature of an instrument and its regulatory categorization although this is not the case across all jurisdictions.

We agree that a distinction needs to be made between the legal nature of allowances and their regulatory classifications and have therefore amended the recommendation and the report itself to reflect both aspects.

Explanatory text:

While derivatives on allowances generally fall under the regulatory framework applicable to commodity derivatives, and within the jurisdiction of financial regulators, there is sometimes less clarity on the legal nature and regulatory classification of allowances.

The legal nature of an allowance will have an influence over how it is treated by law in case of insolvency as well as for tax purposes while the regulatory classification impacts their applicable regulatory framework and financial regulators' jurisdiction over spot allowances and their trading in some jurisdictions.

The lack of a common legal definition of carbon allowances and the lack of certainty over applicable regulatory framework can also have an impact, more generally, on the increase in standardization for derivative contracts, suggesting benefits in defining the legal nature and regulatory classification of allowances across jurisdictions. For example, in the EU and the UK, allowances have been defined as financial instruments.

Recommendation 7: Relevant authorities should encourage the scrutiny of auction performances.

Feedback to the consultation:

Respondents to the IOSCO consultation were supportive of this recommendation which can, as a result, be considered final.

Explanatory text:

This type of scrutiny should include checks to ensure the efficient dissemination of allowances from auction participants to other market participants. In that context, it would also be important to establish the necessary mechanisms to avoid price manipulation such as bid shedding or short squeezing. Confidence of market participants in the execution of the auction is key to the success and integrity of CCMs.[78] As a mechanism to enhance scrutiny of auction performances, auctioning in some jurisdictions, such as the EU and the UK, are required to be performed by regulated exchanges.

Recommendation 8: Relevant authorities should consider establishing clear and robust frameworks for conducting market surveillance, overseeing of entities' behavior in spot and derivatives carbon markets and ensuring appropriate enforcement.

Feedback to the consultation:

Respondents to the consultation were supportive of this recommendation. A minority, however, suggested that position limits, position reporting and position management controls may increase the compliance burden on market participants, harming market liquidity and robust market participation – particularly in emerging markets. Some respondents also suggested that the impact of regulatory oversight frameworks could impede participation from smaller participants.

We do not propose to change the recommendation as it currently stands and therefore consider it to be final but have clarified in the explanatory text below that the use of position limits and other position management controls are one example of the type of framework jurisdictions may wish to put in place.

Explanatory text:

The overarching objectives of regulatory trade reporting requirements across jurisdictions are to (i) mitigate systemic risk; (ii) enhance transparency of trade information and (iii) support the detection and prevention of market abuse.

In that context, relevant authorities should set out requirements for the reporting of transactions and positions – both exchange and OTC traded to financial regulators as this allows regulators

[78] http://awsassets.panda.org/downloads/oko___2007___auctioning_in_the_eu_ets_v2_8final_10_09_2007.pdf

to gather information on market movements and to conduct market surveillance. Where relevant information, particularly transaction and position reports, is allocated to different authorities and/or jurisdictions, cooperation and information sharing is key to conduct proper market surveillance. This can be complemented by information sharing, including through cooperation arrangements between the relevant authorities.

By way of example, certain jurisdictions have imposed position management controls for commodity derivatives to prevent disorderly trading and ensure a fair price discovery process. Those are measures that allow derivatives' exchanges, which offer commodity derivatives for trading, to monitor the positions held by market participants in such derivatives and require them additional information on the reasons why such positions have been built up, should they exceed a certain threshold. A trading venue shall inform the relevant public authorities on those instances. Other jurisdictions have imposed position limits that impose a restriction on the number of credits or derivatives that may be held by a market participant or a group thereof.

Relevant authorities should also consider enforcement tools they may need to ensure firms meet their obligations. From a financial markets' perspective, regulatory authorities will typically have a range of tools to address market abuse. On the environmental side, elements such as fines can also be considered.

Recommendation 9: Relevant authorities should ensure that the relevant market infrastructures (e.g., trading venues, auction platforms, central counterparties, registries) are robust and properly regulated.

Feedback to the consultation:

Some respondents to our consultation expressed concerns that we may be promoting the establishment of new market structures. We wish to clarify that the intention of this recommendation is to promote the use of existing market structures and is as such consistent with IOSCO´s Objectives and Principles set out in section 5 of this report.

Explanatory text:

The IOSCO Principles suggests the establishment of trading systems "*should be subject to regulatory authorisation and oversight",* noting there should be ongoing supervision of exchanges and trading systems to ensure that trading integrity is maintained.[79] This principle is directly applicable to any financial market, including carbon markets and is often already in application in those jurisdictions where CCMs exist.

Trading on regulated trading venues increases price transparency, promotes liquidity, and enhances the management of positions. These market infrastructures also allow for the broader regulated ecosystem to come into play such as clearing, margining, settlement and the careful unwinding of positions where needed.

Equally important is the verification of emissions reduction. Jurisdictions should have in place robust systems to verify that the emissions data reported by the compliance entities is accurate and that they have followed the appropriate protocols for measurement.

[79] https://www.iosco.org/library/pubdocs/pdf/IOSCOPD561.pdf

Recommendation 10: Relevant authorities should encourage the development of standardized derivatives contracts.

Feedback to the consultation:

Respondents to the IOSCO consultation were supportive of this recommendation.

Explanatory text:

Bespoke derivatives contracts will always be necessary for parts of the market as they cater for firms that have particular hedging needs. However, there is merit in encouraging the development of standardized derivatives contracts. In practice, standardized contracts can allow for greater tradability, facilitate risk management, and foster central clearing where applicable.

Standardization provides greater comparability between products and increases legal certainty for market participants. In doing so, standardization facilitates liquidity and enhances price discovery. In addition, standardization can help in reducing counterparty credit risk as it facilitates exchange trading and the use of central counterparty clearing. In that same vein, standardization promotes operational efficiency by allowing for the development of automation in both the trading and post trading value chain.

Some private entities, such as the International Swaps and Derivatives Association, have conducted a lot of work over the years in providing the infrastructure necessary to reach standardization in derivatives markets. In certain jurisdictions, one way to encourage standardization could be, for example, for relevant authorities to engage with exchanges and other market participants, such as ISDA, to facilitate the move to standardized contracts.

Recommendation 11: Relevant authorities should consider public disclosures about aggregate positions, as well as periodic public reporting derived from regulatory data.

Feedback to the consultation:

Respondents to the consultation noted that in some cases, positions of specific market participants could become known to the market through the release of aggregate data due to the bespoke nature of certain positions and insufficient market depth.

While we continue to believe the recommendation in itself is appropriate and should therefore be considered final, we have added explanatory text below for those jurisdictions seeking to establish compliance markets in their jurisdictions. As with any other type of financial market, jurisdictions should have tools in place to mitigate the risk of divulging the positions of specific market participants.

Explanatory text:

There are different approaches to achieving this outcome. Certain emission schemes publish reports on the functioning of their markets while others offer access to lagged registry information. Aggregated positions held by type of participants in emissions allowances and derivatives, could for example be made public by venues. This type of information can allow a broader set of stakeholders to take a view of supply and demand as well as possible friction in the market.

As noted above, when considering the public disclosures of positions, relevant authorities should carefully consider the depth of their markets and ensure they have appropriate tools in place to mitigate the risk of public reporting exposing market participants.

Recommendation 12: Relevant authorities should, within their mandates, set clear lines of responsibilities and cooperation between authorities in charge of compliance markets at the primary and secondary market level, including both environmental and financial agencies as appropriate and promoting regulatory coordination between these entities.

Feedback to the consultation:

Respondents to the IOSCO consultation were supportive of this recommendation.

Explanatory text:

While compliance markets have a specific environmental objective, i.e., the reduction of greenhouse gas emissions, they function in many ways – notably with regards to the functioning of their secondary markets – like other financial markets.

To that extent, it is important that the financial dimension of trading is taken into account by all parties involved when setting up compliance markets. This is a necessary condition to attract market participants beyond compliance entities, thereby promoting market depth and liquidity.

In that same vein, it is important to have due regard to the impact of policy decisions at primary market level on the secondary markets through ex-ante and data-driven assessments of these impacts.

Finally, some of the risks this report highlighted above, notably with regards to market abuse, can appear across both primary and secondary markets.

With that in mind, and in addition to setting clear lines of responsibilities between authorities, cooperation is important. As such, an effective information sharing between the relevant authority for primary markets and the relevant authority for secondary markets – typically the financial regulator – may be important to develop, for example through the establishment of a memorandum of understanding (MoU) between both parties.

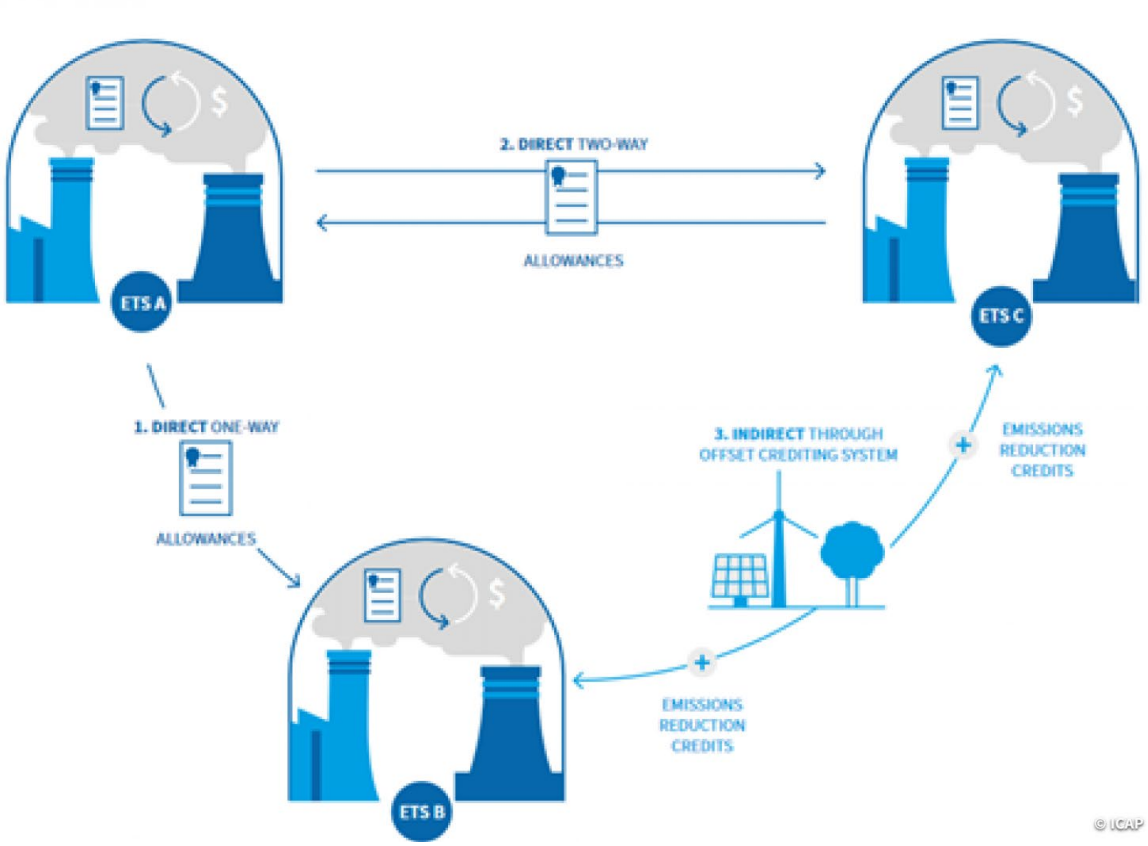
Chapter 7 – Cross-border and cross-market interconnections – current practices and future considerations

7.1. Linking compliance markets

Beyond our recommendations on the sound establishment of compliance markets, there may also be merit in considering mechanisms that would, over time, lead to a consistent price for carbon globally while acknowledging jurisdictional needs and market specificities, especially from emerging jurisdictions.

The intention behind linking ETS systems is to allow market participants to acquire and use emission allowances across different regions or jurisdictions which could ultimately enhance liquidity and market stability and contribute to scale emissions reductions.

Through linking, different systems create a direct or indirect connection with each other. According to the International Carbon Action Partnership (ICAP), systems link directly if emission allowances of one scheme can be surrendered in another. This can be done either bilaterally where both systems' allowances can be used in either system, or unilaterally if this is only the case in one system. Systems can also link indirectly, for example through the common acceptance of an international standard.[80] This type of approach is one way to create an international carbon market.



Source: ICAP

[80] https://icapcarbonaction.com/en/linking

Feedback from the consultation

Respondents to the IOSCO consultation suggested that linking CCMs schemes could support broader public policy objectives at primary market level, most notably those pertaining to the fight against climate change. These respondents suggested it would have the consequence of increasing trading activity and improving market liquidity, thereby producing a more reliable price for carbon emissions by creating, over time, a global compliance market. They also suggested linking schemes could broaden the range of abatement options, reduce the risk of carbon leakage and avoid the need for carbon adjustment mechanisms. This aligns with IOSCO's view in our consultation paper where we stated that "*Linking markets together should promote trading and lower the overall cost of reducing emissions, thereby leading to a global carbon market for emission allowances. Over time, this type of approach may however require greater collaboration across regulators to be successful – both across and within jurisdictions."*

As markets continue to emerge and develop, there may therefore be merit in considering how to promote further interlinkages between different schemes while acknowledging their different stages of development.

As noted in the Consultation Paper, any further interlinkage is however not exempt of challenge, in particular due to divergent political considerations and environmental ambitions resulting in price gaps between different allowances which might be too large to allow for a link without potential market disruptions. In addition to political risks, linked markets may also be subject to cybersecurity breaches or system disruptions – at a major registry or trading venue – which may impact transaction and ownership records.

To link different ETSs, governing bodies may need to coordinate with respect to their systems and key design features, for example price integrity. In addition, jurisdictions must coordinate to ensure that linking two ETSs would not result in an oversupply of carbon allowances, which would diminish the price signals of the market. Moreover, linking could lead to arbitrage between the different carbon markets. Generally, linkage between two schemes is better for the scheme with more expensive abatement costs, and typically, the other scheme does not want to link and drive up their own costs.

Two respondents suggested a way around these risks would be to have harmonized conditions for linking frameworks but also recognized it may be too early in the development of ETSs to work towards harmonized conditions for linking.

On the back of this feedback, IOSCO has delved into the experiences of the linked schemes of the EU and Switzerland, and California and Quebec, building upon responses to our initial survey to IOSCO members and responses to our consultation report.

In the EU, the EU ETS legislation provides for the possibility of linking the EU ETS with other compatible emissions trading systems in the world at national or regional level, subject to certain conditions being met. These conditions include:

- system compatibility (the systems have the same basic environmental integrity, and a ton of CO_2 in one system is a ton in the other system)
- the mandatory nature of the system,
- the existence of an absolute cap on emissions, and

- including aviation on both sides in the scope of the linked systems wherever possible.[81]

The EU has so far linked its system with Switzerland, having failed to do so with Australia as a result of Australia repealing its ETS program in 2014.

California's program is also directly linked with the Canadian province of Quebec's cap-and-trade system through the Western Climate Initiative, a non-profit initiative that provides the administrative services to run the linked programs, including a single registry system, the same auction platform, and market monitoring services. California's linkage with Quebec has bolstered liquidity even as emission caps and allowances are gradually reduced.

In determining whether to link its program with Quebec's, staff from the California Air Resources Board (CARB) and Quebec undertook an assessment similar in scope to the comparability determinations made by market regulators when considering whether to approve substituted compliance frameworks in other jurisdictions. After determining that the allowances issued by each program, and the number and type of offset credits eligible for use in each program, resulted in similar program stringency, the assessment focused on the procedures and systems: (i) being used to implement the program in each jurisdiction; (ii) needed to be conducted jointly by the linked jurisdictions; and (iii) needed to work collaboratively to maintain harmonization of the programs. CARB and Quebec found the processes and systems to be consistent and comparable. This finding paved the way for the jurisdictions to hold common allowance auctions and to develop the CITSS platform for purposes of tracking the ownership and transfer of allowances.

With these examples in mind and the responses to our consultation paper, we set out below some considerations for any jurisdictions currently seeking to assess the viability of linking their schemes and ensure that linking their frameworks do not result in any disruption of the markets.

The list is however not intended to establish a closed set of criteria for assessing whether or not any two markets should be linked. CCMs will have specificities in each jurisdiction that should also be taken into consideration for assessing the feasibility of linking schemes.

- Alignment of environmental conditions: the degree of comparability of decarbonization goals.

- The decision to link ETSs should be results driven, i.e., capable of accelerating decarbonization and generating economic benefit.

- The decision to link ETSs should be underpinned by the same core principles that apply to the linking of other regulated markets.

- The schemes should be aligned in terms of scope and harmonized in terms of key features. At a more granular level:

    - Policymakers and regulators should recognize each other´s carbon allowances, and compliance entities to purchase, surrender and transfer carbon allowances

[81] https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets/international-carbon-market_en#ecl-inpage-1031

between the linked CCMs by establishing a secure link between their respective registries or by establishing a centralized registry.

- Alignment of design elements, including caps on carbon allowances, allocation, trading, and settlement methods (including auction processes) should be considered to streamline cross-trading and reduce operating costs.

- Jurisdictions should adopt a strategic, constant and coordinated approach to control the aggregate volume of available carbon allowances; and set clear criteria for the use of carbon allowances. Ideally, any market stability mechanisms should be harmonized upon linkage.

In addition, some of IOSCO's Principles for Securities Regulation may be applicable, namely those pertaining to cooperation in regulation. Indeed, cooperation between relevant authorities is an important element for the successful functioning of any linked scheme. These principles are as follows:

- Principle 13: Regulator should have authority to share both public and non-public information with domestic and foreign counterparts.

- Principle 14: Regulators should establish information sharing mechanisms that set out when and how they will share both public and non-public information with their domestic and foreign counterparts.

- Principle 15: Regulatory system should allow for assistance to be provided to foreign regulators who need to make inquiries in the discharge of their functions and exercise of their powers.

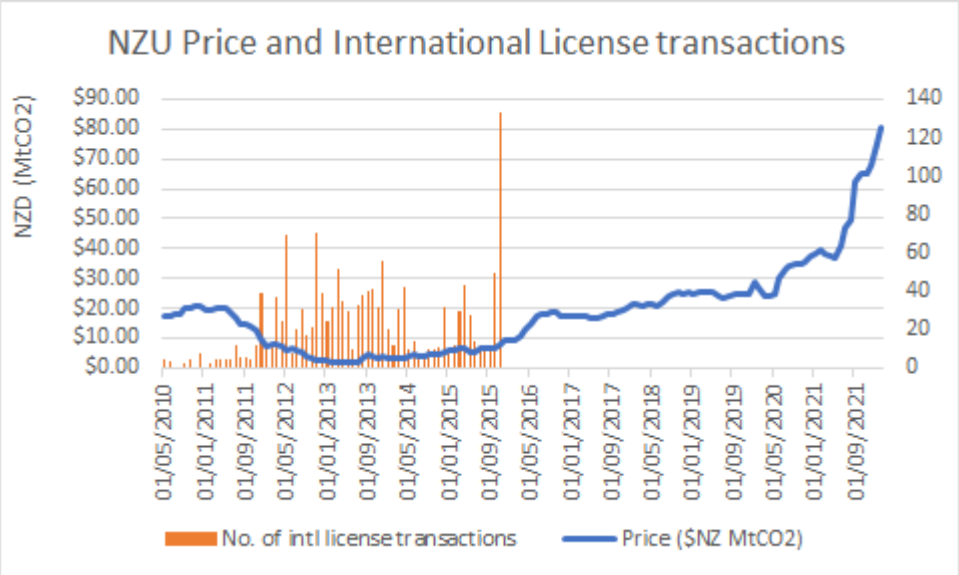
7.2. Interoperability and linkages between compliance markets and offset markets

One question that is currently arising is whether there may be benefit in also considering interlinkages between compliance markets and offset markets – such as those set out under Article 6 of the Paris Agreement or those that have arisen organically from private participant demand.

In the past, allowing offset credits to be used in compliance markets has created arbitrage leading to the price of carbon allowances to drop substantially. For example, in the initial stages of the New Zealand ETS, there was extensive use of international offset credits for local compliance. With the price of such international credits having fallen in most international markets, this placed downward pressure on the price of NZU.

In 2012, international units accounted for more than 80% of total surrendered units. As a result, the price of NZU fell from above NZ$20 in 2011 to below NZ$2 in May 2013. Prices recovered to around NZ$6 in 2015. Since 2016, the price of NZU's have seen robust increases, in large part due to the New Zealand government excluding international credits from the local ETS.

Chart 14: NZU Price and international license transactions



Source: Theecanmole. (2022). New Zealand emission unit (NZU) monthly prices 2010 to 2022: V1.0.01 (https://github.com/theecanmole/nzu) ; https://www.epa.govt.nz/

Similar challenges arose in the EU ETS. In mid-2008, EU carbon prices sank to 10 euros per ton of CO_2 as a result of falling industry output due to the financial crisis. The large influx of international credits via the UN Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs) in the EU ETS during Phase II contributed to the price plummeting as the EU suddenly found itself with too many allowances in circulation.[82] As a result, the use of international credits in the EU ETS was discontinued.

It is worth noting that further announcements on the detailed implementation of Article 6 of the Paris Agreement may provide further clarifications with regard to the interactions between compliance, emission reduction markets, offset markets and nationally determined contributions (NDCs) submissions. However, too many details are still missing at this stage for IOSCO to opine on this matter.

Most respondents to IOSCO's consultation have suggested linking CCMs and VCMs would not be appropriate in the short term, in particular as a result of the perceived lack of integrity in VCMs. Given the speed at which carbon markets and policies within this area are evolving, IOSCO will continue to monitor developments, notably those linked to Article 6 of the Paris Agreement.

[82] Neuhoff et al., 2012; Newell et al., 2012

Appendix 1- Glossary

Glossary	
Article 6.4 Mechanism	The Article 6.4 mechanism is an international market-based mechanism under the Paris Agreement that allows countries to engage in emission trading – which could involve the participation of companies – and transfer mitigation outcomes between countries. This can take the form of (i) internationally transferred mitigation outcomes (ITMOs) or through joint projects. The implementation of this mechanism is still being finalized meaning its implications for existing voluntary carbon markets is unclear.
"Baseline-and-credit" system	A type of compliance carbon market whereby baseline emission levels, i.e., target levels decided by the governmental authorities based on historical data and environmental objectives, are defined for compliance entities and allowances are issued to those that have reduced their emissions below that level.
California Electronic Greenhouse Gas Reporting Tool (Cal e-GGRT)	In the California ETS, a web-based reporting tool that manages the reporting, certification, submission, and verification of emissions data.
"Cap-and-trade" mechanism	A type of compliance carbon market where governmental authorities set an upper limit on the total amount of CO2 that an industry sector can emit. This cap is reduced over time by a predetermined amount. Governmental authorities issue carbon emission allowances that mandate the maximum amount of carbon that covered entities are permitted to emit. At the end of the compliance period entities must surrender allowances back to the governmental entity to cover the greenhouse gas emissions that they created.
Carbon Border Adjustment Mechanism (CBAM)	An EU mechanism through which EU importers would have to buy carbon certificates corresponding to the carbon price that would have been paid, had the goods been produced under the EU's carbon pricing rules. Conversely, once a non-EU producer can show that they have already paid a price for the carbon used in the production of the imported goods in a third country, the corresponding cost can be fully deducted for the EU importer.
Carbon Emission Allowance (or "carbon allowances" or "allowances")	Government issued permits representing the right to emit one ton of CO2 or CO2e. These are instruments acquired to pay for an emission liability and recognize the cost of the negative externality of pollution. Each allowance (or emissions permit) typically allows its owner to emit one ton of a pollutant such as CO2
Carbon emissions	CO_2 and CO_2e emissions

Carbon leakage	A term used to describe the transfer of industrial production to countries with laxer constraints on GHG emissions, due to additional costs resulting from emission abatement activities.
Carbon market	Market mechanism to put a price on carbon emissions and promote the reduction of CO2 emissions into the atmosphere or allow for the compensation of emissions using climate change mitigation projects.
Carbon Offset Credit (or "carbon credits" or "credits)	Government or non-government issued certificates representing the positive externality of an emissions saving of one ton of CO2 or CO2e reduction or removal. These instruments are acquired to compensate/offset for emissions liabilities and consequently recognize the cost of the negative externality pollution.
Clean Development Mechanism (CDM)	International carbon market scheme that allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one ton of CO2, which can be counted towards meeting Kyoto targets.
CO_2e	Carbon Dioxide Equivalent
Compliance Carbon Market (CCM)	A type of carbon market, also called "Emission Trading Systems (ETS)", created and regulated by mandatory national, regional, or international carbon reduction regimes. Their overall objective is to reduce CO2 emissions. There are two types of mechanisms within compliance markets, "cap-and-trade" mechanism and "baseline-and-credit system", and both use tradable allowances to give companies within specific industries, the right to emit one ton of CO2.
Compliance cycle or period	Period at the end of which an emitter subject to the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances must submit to the government a number of GHG emission allowances equal to the total verified GHG emissions that the emitter reported for the period.
Compliance entities	Entities subject to the emissions reduction program in their jurisdiction.
Compliance Instrument Tracking System Service (CITSS)	In California ETS, a tracking system for compliance instruments from the point of issuance by jurisdictions, to ownership, transfer, and finally retirement.
Compliance period	A time period for compliance entities to comply with their carbon emissions limits and surrender allowances equal to their full emissions.
Confidential reserve price	Price that prevents the sale of units at auction significantly below prevailing secondary market prices. It confidential so as to prevent the

	confidential reserve price from becoming the target of strategic bidding behavior.
Double counting	Double counting in emission allowance markets refers to a situation where an emission reduction is claimed by more than one entity, leading to an overestimation of emission reductions. Double counting can occur in the absence of registries when the same emission reduction is counted towards multiple emissions reduction targets or accounting systems.
ETS Registry	An ETS registry is an electronic system that tracks and records the ownership, transfer, and cancellation of emission allowances. An ETS registry provides a secure and transparent platform for the registration, management, and tracking of emission allowances and are typically operated by government agencies or designated organizations responsible for managing the ETS.
Green Transformation League	In Japan, an initiative consisting of companies that will start an ETS program to achieve their emission targets from April 2023.
Legal nature of carbon allowances	The legal nature of carbon emission allowances refers to the fundamental legal characteristics of these instruments whether they are considered property rights that can be bought, sold, and traded on markets, or administrative rights, etc. The legal nature of an allowance will have an influence over how it is treated by law in case of insolvency as well as for tax purposes.
Linked CCMs	CCMs are considered to be linked if emission allowances of one scheme can be surrendered in another.
Market Stability Mechanism	A Market Stability Mechanism is a mechanism designed to address price volatility in carbon markets. It provides a mechanism to adjust the supply of emission allowances in response to changes in market demand, thereby stabilizing the market price of emissions. A market stability mechanism is implemented either as a price-based mechanism where a fixed trigger price is used, above or below which the authority in charge of supplying emissions intervenes in the market or as a quantity-based mechanism whereby a pre-determined quantity of allowances can be auctioned or withdrawn from the market in response to changes in demand.
Minimum reserve price	This is the price floor at which allowances can be sold at auction. Any bids lower than the auction reserve price will not be considered.
Non-compliance entities	Unlike compliance entities, non-compliance entities are entities that participate in compliance

	markets out of choice rather than out of obligation.
Regional Greenhouse Gas Initiative (RGGI)	RGGI is a cooperative, market-based effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, Vermont, and Virginia to cap and reduce GHG emissions from power plants in the region.
Regulatory categorization of carbon allowances	The regulatory categorization of carbon emission allowances refers to how these instruments are classified and regulated by government authorities. Carbon emission allowances can be categorized in a few different ways, such as tradable instruments, financial instruments, or commodity instruments. The regulatory classification impacts allowances applicable regulatory framework and financial regulators' jurisdiction over spot allowances and their trading in some jurisdictions.
Relevant Authorities	Securities market regulators as well as public policy governmental organizations.
Standard setter	In the VCM, carbon crediting programs or schemes that set standards for carbon credit quality, certify and issue carbon credits, and have a registry to track certified credit projects and credit issuance and retirement.
Union Registry	ETS Registry for the European Union.
Verifier	A legal person or entity, or an independent third party, authorized to carry out verification activities for emissions reduction by compliance entities (i.e., (1 tCO2 emitted = 1 tCO2 reported).
Voluntary Carbon Market (VCM)	A type of carbon market where entities voluntarily buy credits generated from projects that either (i) avoided CO2 emissions, (ii) assisted in the reduction of emissions, or (iii) permanently removed emissions from the atmosphere, thereby allowing these buying entities to offset some or all of their own carbon emissions.
Western Climate Initiative	The WCI is a shared ETS between the US States of Washington and California and the Canadian province of Quebec.