Turning Climate Goals into Tradable Commodities

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Trading European Carbon Credits
UBS ETFs On Track Research

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What is the EU Emission Trading System?

The European emissions trading market is essentially a market place where emissions allowances are traded. It is officially known as the EU Emissions Trading System (EU ETS) and according to the EU it is "a cornerstone of the EU's policy to combat climate change and its key tool for reducing greenhouse gas emissions cost-effectively".[1]

Emissions are known by multiple names or terms, such as 'carbon credits', 'carbon allowances', 'emissions credits' or variants thereof. The main term used under the EU ETS is 'emissions allowances' or EUAs. Put simply, each EUA gives the "holder the right to emit:

– one metric tonne of carbon dioxide (CO_2), the most common greenhouse gas, or
– the equivalent amount of two more powerful greenhouse gases, nitrous oxide (N_2O) and perfluorocarbons (PFCs)."[1]

The EU ETS works on a compulsory cap-and-trade principle. This means that a cap is set on the maximum amount of greenhouse gases that can be emitted by members of the system. Mandatorily participating businesses from the power, aviation, shipping and energy intensive manufacturing sector can then buy or sell EUAs within the system, as can other members of the EU ETS who are not Mandatory Participants.

By 31 March, each Mandatory Participant must report its relevant greenhouse gas emissions (those emissions covered by the EU ETS) during the previous calendar year. The Mandatory Participant then has until 30 April to surrender allowances for all of its covered emissions. If these requirements are not met the Mandatory Participants face a fine per missing allowance. Once surrendered, the allowances are then cancelled.

Reductions in the number of allowances in the EU ETS

The cap is reduced over time, resulting in an explicit objective of decreasing emissions. This appears to have worked so far, with the EU providing the following commentary and statistics[2]:

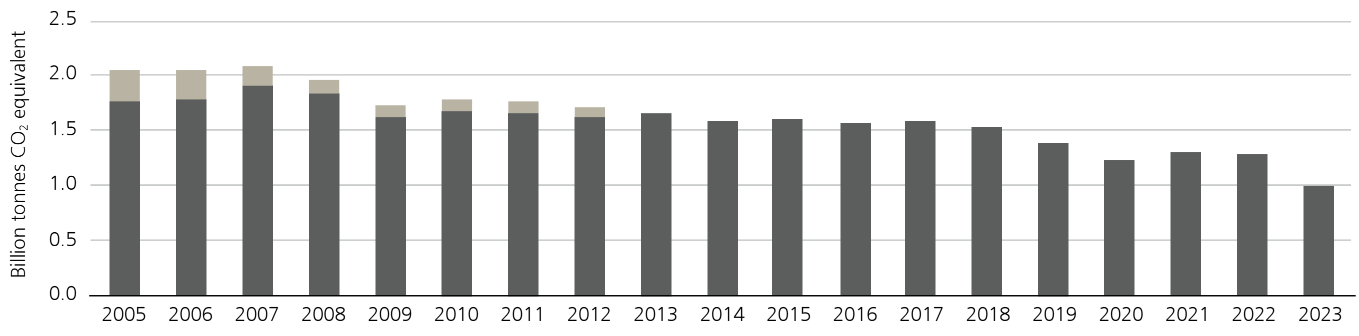
The EU Emissions Trading System has proven to be an effective tool in driving emissions reductions cost-effectively. Emissions from installations covered by the ETS declined by about 37% between 2005 and 2022. In 2030, emissions from sectors covered by the EU ETS will be cut by 43% from 2005 levels, as part of the EU's current 2030 climate and energy framework.

However, the EU intends to implement even more ambitious cuts[3]:

Under the European Green Deal, the [European] Commission presented in September 2020 an impact-assessed plan to increase the EU's greenhouse gas emission reduction target to at least 55% by 2030. The [European] Commission has since then implemented many measure to achieve said goal. A clear timeline of legislative action concerning the green new deal is available on the EU website.

The EU has an explicit objective of decreasing the annual EUA cap by 4.2% each year from 2022 onwards (compared to 2.2%previously)[4]. According to the EU, this reduction rate is consistent with the "2030 target of at least 40% cuts" in greenhouse gas emissions.

Figure 1: Historical emissions for all in-scope stationary installation



Source: European Commission: https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

1 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/emissions-cap-and-allowances_en
2 https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emissions-under-the
3 https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
4 https://www.easa.europa.eu/eco/eaer/topics/market-based-measures/eu-emissions-trading-system

Voluntary vs. regulatory compliance emissions markets

The EU ETS is a regulatory compliance emissions market. That is to say that its existence was borne out of a desire for governments to limit greenhouse gas emissions through a regulatory framework. Market participants must comply with the regulatory framework.

Voluntary emissions markets (also known as voluntary carbon markets), on the other hand, are not the result of any regulatory framework. They are largely unregulated markets where market participants can purchase/sell allowances to meet their own greenhouse gas emissions objectives.

Phases of the EU ETS

The EU ETS has been developed through a number of phases. Phase 3 came to an end in December 2020, with phase 4 lasting from 2021 to 2030, the longest of all phases to date.

Phase 1

(2005–2007)

Sectors covered

GHG covered: CO_2

Free allocation: almost 100%

Key highlights: laid the foundations of emissions trading by setting the necessary legal and regulatory frameworks and establishing a price for greenhouse gas emissions.

Phase 2

(2008–2012)

Sectors covered

GHG covered: CO_2, N_2O[2]

Free allocation: down to 90%

Key highlights: coincided with a period where the countries in the EU ETS had concrete emissions reduction targets to meet. 3 more countries joined the system in phase 2, and the auction method was introduced to distribute EUAs. Caps on EUAs were reduced ~6.5% compared to 2005 levels and penalties for non-compliance jumped to EUR 100 per tonne. International emissions credits were introduced and the aviation sector joined other energy-intensive industries in the EU ETS.

Phase 3

(2013–2020)

Sectors covered

GHG covered: CO_2, N_2O[1], PFCs from aluminium production

Free allocation: overall around 40%

Key highlights: nation-wide caps were replaced with a single EU-wide emissions cap and auctioning has become the leading method of allocating allowances among the growing group of EU ETS members.

Phase 4

(2021–2030)

Sectors covered

GHG covered: *from 2026*

Free allocation: down to 0% for most sectors

Key highlights: is to enable a smooth and effective transition to a low-carbon economy in line with both EU's 2030 emissions reduction targets and the Paris Agreement.

Power generators | Energy-intensive industries | Nitric, adipic and glyoxylic acids production
Commercial aviation within EU ETS countries | Buildings | Road transport | Maritime transport

Source: UBS Asset Management
For illustrative purposes only.

Participating industries

The EU ETS applies to more than 10,000 heavy-energy using installations (power stations, manufacturers, airline and shipping operators).

The EU ETS covers the following greenhouse gases from specific activities, focusing on emissions that can be measured, reported and verified with a high level of accuracy:[5]

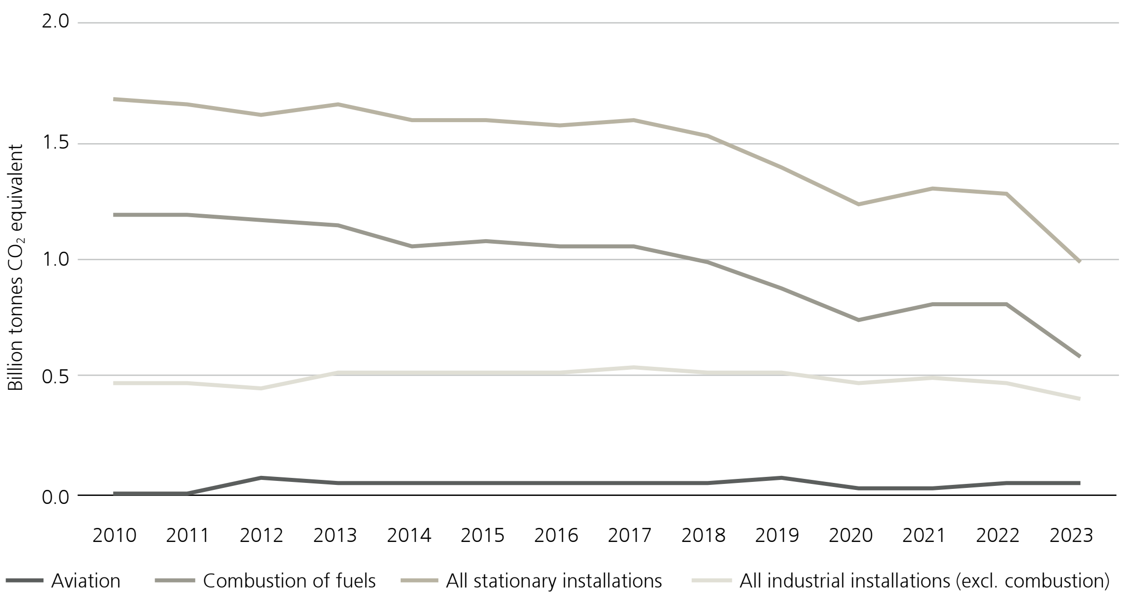
Carbon dioxide (CO_2) from
– electricity and heat generation
– energy-intensive industry sectors, including oil refineries, steel works, and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals
– aviation within the European Economic Area and departing flights to Switzerland and the United Kingdom
– maritime transport, specifically 50% of emissions from voyages starting or ending outside of the EU and 100% of emissions from voyages between two EU ports and when ships are within EU ports.

Nitrous oxide (N_2O) from production of nitric, adipic and glyoxylic acids and glyoxal

Perfluorocarbons (PFCs) from the production of aluminium.

Participation in the EU ETS is mandatory for companies in these sectors[6].

Figure 3: Emission by Sector



Source: European Commission: https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

5 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/scope-eu-emissions-trading-system_en
6 However, in some sectors, only operators above a certain size are included and certain small installations may be excluded if governments put in alternative measures to cut their emissions.

Allocation vs. auction

The initial phases of the EU ETS allowed for a free allocation method of EUAs. As of phase 3, however, the system moved to an auction method as default. Under this method, around 60% of all EUAs are auctioned, with the remaining amount subject to the free allocation method.

Whether EUAs are auctioned or allocated depends largely on the sector. For example, with the exception of a few countries, power generators must currently buy all their allowances.

In aviation, however, only 15% of the EUAs are auctioned, with the majority of the allowances being granted for free on the basis of independently verified airline efficiency in transporting passengers and cargo. Aircraft operators with a higher efficiency score receive a higher share of their annual allowances for free.

In sectors and sub-sectors deemed to be exposed to a significant risk of 'carbon leakage', emitters receive special treatment to support their competitiveness by allocating a higher share of free allowances compared to the other industrial installations.

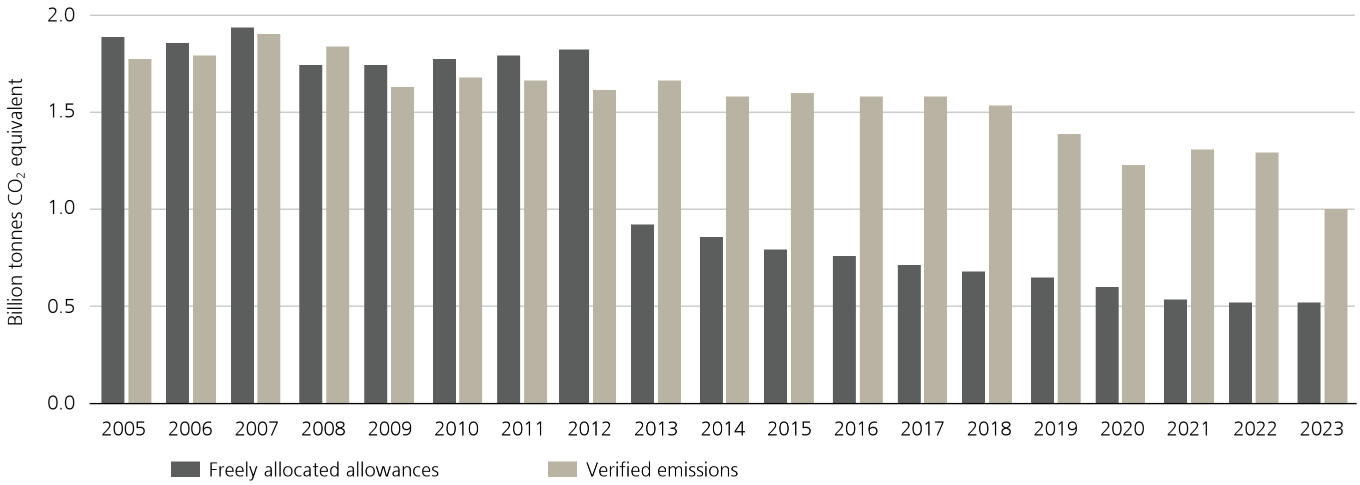
Figure 4: Allocated allowances vs verified emissions

Preventing 'carbon leakage'

'Carbon leakage' refers to the situation that may occur if, for reasons of costs related to climate policies, businesses transfer production to other countries which have laxer constraints on greenhouse gas emissions. This could lead to an increase in their total emissions. The risk of carbon leakage may be higher in certain energy-intensive industries.

The sectors and sub-sectors deemed to be exposed to a significant risk of carbon leakage are placed on an official list. The list is established for five years, on the basis of clearly defined criteria and after extensive consultation with stakeholders.

An additional measure to prevent carbon leakage is the EU's **Carbon Border Adjustment Mechanism** (CBAM) which aims to fairly price carbon emissions from carbon-intensive goods imported into the EU. It ensures imported goods' carbon costs are on par with those of EU products, aligning with the EU's climate goals and WTO rules. Scheduled for full implementation by 2026, it's currently in a 2023–2026 transitional phase, coinciding with the phase-out of free EU Emissions Trading System (ETS) allowances to promote EU industry decarbonization.



Source: European Commission: https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

Use of auction revenues:
Since the beginning, around EUR 161 billion has been collected via auctions since 2008, including around EUR 42.2 billion in 2023 alone. Revenues of these auctions go to participating countries, and at least half of the revenues must be used for climate- and energy-related purposes. Member states must report to the European Commission about how they use their revenues but are free to choose how to invest the funds. In 2019, member states spent close to 80% of their revenues on domestic and international climate-related investments. The EU also retains a part of the revenues to finance two funds for innovation and modernization: The first fund focuses on supporting innovation in energy-intensive industries, renewable energy, energy storage, and carbon capture, use, and storage. The second fund is designed to help ten low-income EU member states to reduce the climate impact of their energy systems by funding modernization projects and improve energy efficiency, including investments to support the social transition to a low-carbon economy (e.g., upskilling/reskilling of affected workers).

EU carbon market for an investor

The EU ETS has grown into a large and investable market with high liquidity and transparent pricing mechanisms. The market is highly regulated, with robust monitoring, reporting and clear quality verification standards.

Accessibility
Allowances available via auctions and at publicly Tradable exchanges

Market size
EU ETS is the largest carbon market with a size exceeding EUR 751bn in 2022

Liquidity
High liquidity with annual trading volume at EUR ~230bn

Standardised
Allowances are uniform and deliverable across phases. Stable pricing/ valuation methodology

Valuation
EU ETS phase 4 established providing measur-able price drivers. Political and regulatory risks remain prevalent

Source: Adapted from McKinsey, "Putting carbon markets to work on the path to net zero", October 2021.
For illustrative purposes only.

Risk-returns characteristics and performance

Carbon has exhibited attractive historical returns and a low correlation with other asset classes, making it potentially attractive within a diversified portfolio.

Figure 5: Key financial figures matrix

Investment	Annualised return	Annualised volatility	Sharpe ratio
EUA Carbon	32.0%	49.6%	0.62
Global Equities	11.2%	16.3%	0.60
Global Bonds	0.4%	6.1%	-0.18
Hedge Funds	2.9%	4.2%	0.32
Commodities	4.9%	14.5%	0.24

Source: UBS, Bloomberg. Data as of 28 January 2016 to 18 March 2024 Weekly Interval (2016–2024)

Figure 6: Correlation matrix

Investment	Global Equities	Global Bonds	Hedge Funds	Commodities
EUA Carbon	29%	17%	24%	13%
Global Equities		39%	83%	44%
Global Bonds			26%	16%
Hedge Funds				43%

Source: UBS, Bloomberg. Data as of 18 March 2024

In a Nutshell: UBS European Physical Carbon ETC

The Emissions Trading Scheme is a market-driven approach to reducing pollution. It is based on the polluter payer principal and a cap and trade system. Polluters pay for their greenhouse gas emissions, which helps bring emissions down and generates revenues to finance the EU's green transition,

By establishing a cap on the total emissions allowed and distributing emissions allowances among participating entities, the system creates a financial incentive for companies to reduce emissions. Entities that reduce their emissions below their allowance can sell their excess allowances to those who exceed their limits, encouraging investments in more sustainable technologies and methods.

The system operates in all EU countries plus Iceland, Liechtenstein and Norway (EEA-EFTA states) and covers emissions from around 10,000 installations in the energy sector and manufacturing industry, as well as aircraft and shipping (2024) operators flying within the EU and departing to Switzerland and the United Kingdom – or around 40% of the EU's emissions.

UBS AM launched a new ETC providing exposure to the spot price of EU Allowances (EUAs). Each unit of the UBS European Physical Carbon ETC is directly backed by EUAs issued under the EU's Emissions Trading Scheme (EU ETS), the world's biggest and most heavily traded market-based system.

This ETC is tied to the EU's Emissions Trading Scheme, however, it is not classified as a sustainable product and has no sustainability objectives whatsoever.