

2024 State of the EU ETS Report



Das Innere der Wiener Börse.

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List of abbreviations

CBAM	Carbon Border Adjustment Mechanism
CCfDs	Carbon contracts for difference
CCU	Carbon capture and utilisation
CCS	Carbon capture and storage
Commission	European Commission
COP28	The 28 th United Nations Climate Change Conference of the Parties
CRCF	Carbon Removal Certification Framework
EEA	European Economic Area
EED	Energy Efficiency Directive
ESMA	European Securities and Markets Authority
ETS	Emissions Trading System
EUA	EU emission allowances
EUTL	European Union Transaction Log
GHG	Greenhouse Gas
ICAO	International Civil Aviation Organisation
IMO	International Maritime Organisation
IED	Industrial Emission Directive
KPI	Key Performance Indicator
LRF	Linear reduction factor
MRV	Monitoring, Reporting and Verification
MSR	Market Stability Reserve
NDC	Nationally Determined Contributions
RCF	Recycled Carbon Fuels
RED	Renewable Energy Directive
RFNBO	Renewable Fuels of Non-Biological Origin
RRF	Recovery and Resilience Facility
TNAC	Total number of allowances in circulation
SAFs	Sustainable Aviation Fuels
SCF	Social Climate Fund
UKA	UK emission allowances

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Key takeaways

- The current EU ETS context is shaped by the economic and political landscape. Many changes were implemented during this Commission which will affect the outlook for EU climate policy and the EU ETS. The forthcoming EU political elections bring an inevitable sense of uncertainty. Questions regarding the role, architecture, and governance of the EU ETS post 2030 are already being raised.
- Some uneasiness resurfaces again with respect to impacts of regulatory interventions, as illustrated by the RePowerEU auction, which is seen as not transparent and unpredictable, pointing to governance concerns.
- This year's report identifies KPIs to evaluate EU ETS achievements against established baselines. Present trends indicate that the industrial sectors under EU ETS will face significant challenges to meet an ambitious 2040 target of a 90% reduction in GHGs emissions.
- This highlights new international efforts and an increase in international climate diplomacy as an essential component of EU policy going forward. The international success of the CBAM is palpable, even if still untested in the international trade and climate policy frameworks.
- From an environmental standpoint, 2023 stands out as an outstanding success for the EU ETS, recording a 16% reduction in emissions – the most substantial decrease since its inception in 2005.
- However, the level of emissions from EU ETS-covered installations were affected by different factors, with the decrease in industrial emissions (7%) due to a crease in industrial activity highlighted. Industrial activity was also strongly affected by energy prices. But every bit counts, and while direct attribution is not easy, it is counter logical to state that EUA prices at current levels played only a minor role. This ought to be taken seriously by EU institutions and in EU capitals, especially as (trade exposed) industry cannot pass through EU ETS costs.
- On the positive side the focus is clearly now on industrial decarbonization, with sectoral emission intensity decreasing rapidly, but unevenly, due to investments in low carbon projects delivering efficiency gains.
- The introduction of CBAM and the forthcoming phase out of free allocation is a success in that it will provide reasonable protection against carbon leakage in the domestic market. But it also raises costs in a time of inflationary pressures, and there are significant concerns about the lack of export provisions that seems to make EU industry as uncompetitive at the end of this decade and the beginning of the next one.
- The discourse within the EU ETS encapsulates several contentious issues. Notably, stakeholders have expressed concerns about the impact on prices, the lack of transparency, as well as the unpredictability of market interventions (i.e. REPowerEU) in the carbon market despite their good motives.
- The phasing out of free allowances is increasing EU ETS revenues. The EU ETS is now an important source of funding for the green transition and expected to become even more important in the future. Following the high EUAs prices throughout 2022 and 2023, the budget of the last Innovation Fund calls surpassed EUR 3 billion, while the Modernisation Fund has been strengthened and expanded to new recipients.
- This year's Market Sentiment Survey confirms that stakeholders perceive the EU ETS as providing signals for decarbonisation. Nonetheless, there is also a pronounced call to scrutinise drivers of post-2030 decarbonisation in EU ETS sectors. The EU ETS is regarded as an evolving framework, with persistent concerns over competitiveness and CBAM-related exports, alongside extended support for the integration of carbon removals.
- From a market functioning point of view the EU ETS was stable in 2023, particularly compared to the turbulent 2022. EU lawmakers finalised reforms after two years of back-and-forth negotiations, providing market certainty, somewhat disrupted by the price impact of perceived unpredictable regulatory interventions. The lack of volatility and disruption appeared to dissuade some participants, as open interest dropped, and traded volumes and auction participation steadied.

1. Background

The State of the EU ETS Report is an independent effort that is not intended to duplicate or replace mandated work undertaken by the Commission. It focuses on assessing the performance of the EU ETS at the time when the Report is produced.

This Report is intended as a ‘snapshot’, providing policymakers and stakeholders with an overview of how the EU ETS is doing by April of each year, based on previous year data. Despite the limitations imposed by the availability of publicly accessible data, the Report endeavours to address whether the EU ETS is ‘fit for purpose’.

The adoption of the EU ETS Directive in May 2023¹ has renewed the EU’s commitment to an ambitious climate policy. Nonetheless, this renewal sparked concerns about competitiveness, stemming from an increase in emission coverage against a backdrop of sluggish industrial output.

The discussion surrounding the future of the EU ETS is gaining momentum. As we approach the mid-2020s, a key topic for discussion is whether the EU ETS is the right instrument as we reach zero allowances, and what architecture and governance it should have.²

The future inclusion of some sectors in the EU ETS also remains unclear. The legislator foresees a review of the contribution of the EU ETS to international aviation by 2026. Similar uncertainty exists for GHG emissions from maritime transport, with only voyages between EEA areas being fully covered in 2024. In the absence of international progress, we should question whether the EU is satisfied with International Maritime Organization (IMO)/International Civil Aviation Organization (ICAO) outcomes and the implications for the carbon markets. While outside the scope of this Report, the impact of a new ETS for road transport, buildings, and other emissions not covered by the current ETS should not be forgotten.

While the EU’s 2030, 2040, and 2050 decarbonisation commitments are enshrined in law, we should not overlook the potential impact of the EU political cycle. 2024 will be a year of EU elections.

2. An EU ETS ‘fit for purpose’

To assess if the EU ETS is ‘fit for purpose’, we first need to identify the parameters measuring its success. Simply put, ‘what do we expect the EU ETS to deliver?’ Identifying these parameters requires a thorough analysis of the experiences gained from carbon pricing, both within and outside the EU.

Additionally, insights from other non-carbon markets may provide further benchmarks for success. However, it should be noted that certain Key Performance Indicators (KPIs) may entail a degree of subjectivity and political judgment. In this context, it is worth recalling Article 1 of the EU ETS Directive:

‘This Directive establishes a system for greenhouse gas emission allowance trading within the Union (hereinafter referred to as the “EU ETS”) in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner.

This Directive also provides for the reductions of greenhouse gas emissions to be increased so as to contribute to the levels of reductions that are considered scientifically necessary to avoid dangerous climate change. It contributes to the achievement of the Union’s climate-neutrality objective and its climate targets as laid down in Regulation (EU) 2021/1119 of the European Parliament and of the Council and thereby to the objectives of the Paris Agreement.’

¹ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC (Text with EEA relevance). *Official Journal L 275*.

² The ‘Future of the EU ETS’ is a process that ERCST is putting into place as an independent review. In the framework of this sub-workstream, ERCST will organise thematic events focused on key issues for the EU ETS: carbon removals, ETS extension to new sectors, governance, etc.

Some objectives are clearly enunciated and identified, while some stakeholders may seem implicit. The direct deliverables assessed by this Report include:

1. **Environmental delivery.** Does the EU ETS deliver against absolute environmental targets? (Chapter 4)
2. **Socio-economic delivery.** Does compliance with EU ETS deliver macroeconomic efficiency and cost-effectiveness? Does it provide effective protection against carbon leakage? Is it a driver for change without destroying EU industrial competitiveness? Does it ensure a just transition? Is providing what regulation consider a price signal allowed? (Chapter 5)
3. **Market functioning.** The EU ETS is a regulatory market, which is a complex set-up. Is it worth having a market only if it functions well and leads to good price discovery? (Chapter 6)

Over time, other deliverables or indicators have come to be ‘expected’ or ‘understood’. Some of these, wrongfully in our view, equated the proper functioning of the EU ETS with the delivery of a ‘right price’ that incentivises specific technologies or approaches. This Report will not judge the success or failure of the EU ETS based on prices: the EU ETS needs to be, by definition, technologically neutral, and should not be misused as an instrument to promote certain approaches or technologies, or as a source of revenues.

Long-term competitiveness

One aspect not explicitly mentioned is the expectation that the EU ETS will contribute to ensuring a long-term competitive advantage for Europe. Some stakeholders see the EU ETS as an instrument of broader societal economic and social engineering that will also:

- provide a price signal to accelerate the economic transition in a sustainable way and change societal values, behaviour and systems;
- address the socio-economic impacts associated with the transition to a low-GHG economy; and
- contribute to the creation of a market for low-carbon products.

Progress towards these objectives can be quantitatively assessed by KPIs such as the amount of investment, jobs created, and the number of retrained workers. Other long-term objectives are less mature and transparent in the debate. Hence, developing specific KPIs for them can be more challenging.

Promoting carbon pricing

Given its early and wide-scale adoption of an ETS, the EU has become an established player in promoting carbon markets to address climate change globally. Many studies, including the recently released ICAP Status Report 2024³ and the World Bank’s State and Trends of Carbon Pricing 2023 Report,⁴ show that carbon pricing is spreading across the world at increasing pace.

The EU ETS and accompanying instruments (i.e. the Carbon Border Adjustment Mechanism (CBAM)) extend their reach through internationalisation, linkage of carbon markets, and use of Article 6 of the Paris Agreement for offsets. The EU follows three main strategies to promote the introduction of carbon markets worldwide.

Firstly, though ‘leading by example’ and persuasive climate diplomacy hinged on multiple bilateralisms, the EU invites other jurisdictions to draw inspiration from the EU ETS. One recent example is the Commission’s plans to launch a task force supporting the creation of carbon markets globally, fostering international trade of CO₂.⁵ Another is the Council of the European Union’s adoption of ‘green diplomacy’, calling for foreign countries to develop carbon pricing policies.⁶

Secondly, it leverages its market power to include climate ambition clauses in free trade agreements, thereby indirectly promoting carbon abatement beyond the EU.

Lastly, the EU employs measures like the CBAM as ‘sticks’ to prompt jurisdictions to adopt carbon pricing.

³ ICAP (2024) [Emissions Trading Worldwide: 2024 ICAP Status Report](#).

⁴ World Bank (2023) [State and Trends of Carbon Pricing 2023](#).

⁵ Reuters (2024) [EU to step up efforts for more carbon markets worldwide](#).

⁶ Council of the European Union (2024) *Council Conclusions on EU Green Diplomacy. EU diplomacy promoting the just and inclusive green transition and supporting the implementation of global commitments*. <https://data.consilium.europa.eu/doc/document/ST-7865-2024-INIT/en/pdf>

Predictability

Predictability is key to guaranteeing long-term investment, the smooth operation of the EU ETS, and a credible policy signal. The EU ETS Directive provides short- to mid-term emissions reduction targets until 2030 (Phase 4). Additionally, the adoption of a Net Zero objective by 2050, paired with the recently announced 2040 target of 90% net GHG emissions reduction vs a 1990 baseline, provide long-term orientation and predictability.⁷

In this context, EU policymakers decided to widen the scope of Article 1 of the EU ETS Directive, so that the scheme ‘contributes to the achievement of the Union’s climate-neutrality objective and its climate targets as laid down in Regulation (EU) 2021/1119 of the European Parliament and of the Council and thereby to the objectives of the Paris Agreement’.

Although much remains to be done, the recognition of a longer-term objective for the EU ETS is a first step to achieving a higher degree of predictability in the EU carbon market.

3. Regulatory developments

3.1. EU ETS review

In 2023, the EU ETS saw the consultation and adoption of EU ETS-related secondary legislation. The increased number of regulations is presented below to show the complexity. This complexity is becoming increasingly evident and, in some cases, constrains the EU ETS in terms of price discovery and the impact prices can have on investment decisions.

3.1.1. Secondary legislation

For a first group of acts, consultation started in September 2023 with final adoption in 2024. A second group of acts are still to be adopted, while there is no certain adoption date for other ongoing consultations.

Table 3.1: Status of EU ETS acts following adoption of the revised Directive 2003/87/EC

Legislation	Type of act	Revised elements⁸	Consultation	Adoption
Innovation Fund C(2023) 6043 final	Delegated	• Increase from 450 million to 530 million EUAs. • Scope: New sectors (e.g. maritime transport). • New categories: Medium-scale projects (EUR 20 million up to EUR 100 million). • Competitive bidding: Fixed premium auctions, CCfDs, etc. • Stronger attention to geographical balance.	10 July until 7 August 2023	15 September 2023
Auctioning Regulation C(2023) 6751 final	Delegated	• Scope extension to cover maritime transport. • Scope extension to create a separate ETS2. • Aviation full auctioning by 2026. • Auctioning of REPowerEU volumes and SCF. • ESMA is now a recipient of information on primary market transactions.	28 July until 25 August 2023	17 October 2023
Climate neutrality plans C(2023) 7298 final	Implementing	• Minimum requirements and format for district heating and installations with GHGs higher than the 80th percentile in a product benchmark to avoid losing up to 20% of free allocation.	4 August until 1 September 2023	31 October 2023

⁷ European Commission (2024) *Communication Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society*. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2024:63:FIN>

⁸ The revised elements presented do not claim to be an exhaustive analysis of all the changes but rather a non-exhaustive summary of the more relevant elements from our point of view.

Modernisation Fund C(2023) 7833 final	Implementing	• Additional funding (2.5% of total auctioning share). • Scope of priority investments extended to infrastructure for zero-emission mobility. • Modification of GDP criteria and inclusion of Greece, Portugal and Slovenia.	1 August until 29 August 2023	22 November 2023
Union Registry C(2023) 7112 final	Delegated	• New provisions for maritime transport as of 2024. • New provisions for an ETS system for buildings, road transport and additional sectors as of 2027. • Changed compliance deadline for stationary and aircraft operators to surrender EUAs (from 30 April to 30 September).	31 July until 28 August 2023	25 October 2023 12 December 2023 (Corrigend)
Free Allocation Regulation (FAR) C(2024) 441 final	Delegated	• Gradual phase-out of free allocation during a transitional period for CBAM-covered products. • Review of the definitions and system boundaries for product benchmarks. • New conditions on free allocations, with link to implementing act on climate neutrality plans. • Review of rules for exchangeability of fuel and electricity to incentivise electrification. • Requirement for installations to implement energy audits or energy management systems to avoid risk of losing up to 20% of free allocation.	5 December until 2 January 2024	30 January 2024
States aligned with CORSIA C (2024) 1054 final	Implementing	• Listing countries other than EU/EEA, Switzerland and the UK considered to be applying CORSIA.	18 December until 15 January 2024	22 February 2024
Monitoring and Reporting Regulation (MRR)	Implementing	• Extension of monitoring and reporting rules to new sectors (i.e. maritime transport). • ETS2: (Separate) Inclusion of upstream emissions from fuels, with MRV starting in 2025. Rules to avoid double counting in EU ETS and ETS2. • New rules on biomass, including adjustments to sustainability criteria. • Reporting rules for aircraft operators for the use of different types of SAFs. • Extended submission of methodology improvement reports for stationary and aircraft operators. • Rules for monitoring of waste incineration, CCUs, RFNBO and RCF (RED II).	26 July 2023 until 23 August 2023	4Q 2023
Accreditation and Verification Regulation (AVR)	Implementing	• Inclusion of GHGs of municipal waste incinerators with a total rated thermal input exceeding 20 MW. • Extended scope for activities of the EU ETS Directive. • Verification rules to confirm energy audit reports.	18 March 2024 until 15 April 2024	June 2024

In addition, regulations whose adoption has been announced include the Activity Level Change Regulation, update of benchmark values for 2026-2030, and rules for permanent emissions storage through CCS and CCU. Upcoming announced acts on aviation include rules for calculating offsetting requirements under CORSIA and calculating the price difference between eligible fuels and kerosene.⁹

⁹ The list presented above is non-exhaustive and does not include specific secondary legislation adopted for maritime transport activities.

3.1.2. Other EU policies impacting carbon

The last revision confirmed that the EU ETS will not work in isolation. In our view, several policies outside the EU ETS have an actual or potential impact on the functioning of the EU ETS. This impact is outlined in Table 3.2.

Table 3.2: Other EU policies impacting carbon.

EU policy	How they impact on the EU ETS?
Climate Law	Reduction of GHG emissions aligned and contributing to the achievement of the climate targets as laid down in European Climate Law.
CBAM	Phase-out of free allocation for CBAM-covered goods.
RED	- Sustainability and GHG saving criteria for biomass. - Definition of RFNBOs and RCFs.
EED	- Energy audits and energy management system requirements for not losing free allocation. - Renewable energies and related measures to decarbonise buildings.
REPowerEU	EU ETS revenues (EUR 20 billion) available to increase resilience of the EU's energy system through the RFF.
IED	- Member States should ensure coordination between the IED and the EU ETS regarding GHG permits and changes related to EU ETS installations. - Member States may choose not to impose energy efficiency requirements on combustion units or other units emitting CO₂ that are already covered by the EU ETS.
SCF	EU ETS revenues (50 million EUAs) to support vulnerable groups affected by the inclusion of buildings, road transport and additional sectors in the EU ETS.
Industrial Carbon Management Strategy	Objective to develop policy options for industrial carbon removals, including if and how to account for them in the EU ETS.
Electricity Market Regulation	Objective to decarbonise the electricity sector: Power Purchase Agreements are essential for advancing and providing long-term signals for renewable and low-carbon projects.
CRCF Regulation	CRCF does not apply to GHGs within Directive 2003/87/EC, with the exception of the storage of CO₂ emissions from sustainable biomass that are zero-rated.
CCS Directive	For GHGs verified as captured and transported for permanent storage to a facility operating pursuant to Directive 2009/31/EC, there is no obligation to surrender allowances.
Net-Zero Industry Act	Provides incentives for EU ETS installations to invest in 'CO₂ injection capacity' (additional incentives to the EU ETS carbon price signal).
ReFuelEU Aviation	- Allocating allowances reserved for the uplifting of SAF under the EU ETS. - MRV of SAFs in accordance with Articles 14 and 15 of the EU ETS Directive.
FuelEU Maritime	- Definition of 'administering state' as from the EU ETS Directive. - Monitoring results on bi-annual report referred to in the EU ETS Directive.

Source: ERCST, own elaboration

Box – Other EU policies impacting carbon: REPowerEU.

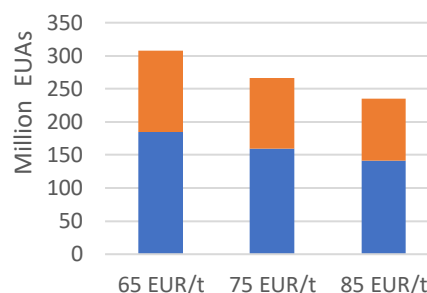
Launched in response to the 2022 energy crisis, REPowerEU is the EU's strategic plan to fast-track the green transition.¹⁰ With REPowerEU, Member States will be entitled to add new REPowerEU financial chapters to their national Recovery and Resilience Facility (RRF) plans.

REPowerEU includes raising EUR 20 billion from two EU ETS auction pots for the 2023-2026 period.¹¹ The frontloading of EUAs will ease supply until August 31 2026 but tighten volumes over 2026-2030.

Between 235 and 307 million EUAs will be sold in the carbon market between 2023 and 2026 to contribute to REPowerEU chapters (Figure 3.1). Given that the amount is specified in euros and not in EUAs, the lower the carbon price, the higher the number of EUAs needed to finance REPowerEU and therefore, creating a potential feedback loop.

Stakeholders have expressed concerns regarding the impact on prices, the lack of transparency, as well as the unpredictability of market interventions due to REPowerEU interventions, even if for good motives.¹²

Figure 3.1: Estimated EU ETS volumes (2023-2026) to achieve REPowerEU objectives



Source: ERCST, own calculation based on Art 10 (6) Auctioning Regulation and Art 10 (e) EU ETS Directive

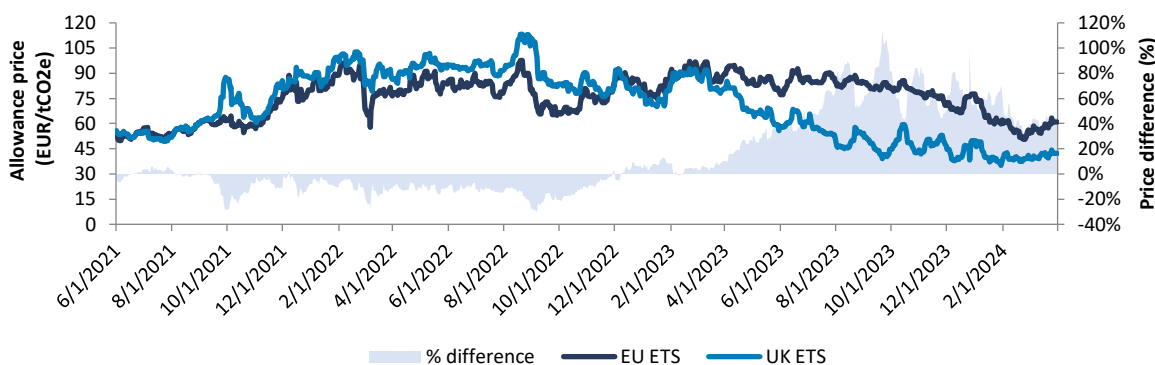
3.2. International carbon price developments

3.2.1. Brexit implications for the EU ETS

3.2.1.1. UK and EU ETS allowance price disparity

Due to Brexit, the emissions of UK-based installations have been regulated under the UK ETS since 2021. Figure 3.2 shows that in 2021 and 2022, UK ETS allowances (UKAs) traded at a premium of around 9% to EU ETS allowances (EUAs). This price difference can be attributed to the difference in fuel mix in the power sector, the smaller size of the UK ETS, and UK ETS entities having had less time to accumulate allowance surpluses.

Figure 3.2: EU ETS and UK ETS allowance price evolution



Source: Compass Lexecon, based on EnergyMarketPrice data

¹⁰ Regulation (EU) 2023/435 of the European Parliament and of the Council of 27 February 2023 amending Regulation (EU) 2021/241 as regards REPowerEU chapters in recovery and resilience plans and amending Regulations (EU) No 1303/2013, (EU) 2021/1060 and (EU) 2021/1755, and Directive 2003/87/EC. Official Journal L 63. <http://data.europa.eu/eli/reg/2023/435/oj>

¹¹ More information on REPowerEU at Marcu, A., López Hernández J.F., Romeo, G. (2023). *EU ETS auctioning & Repower EU*. ERCST.

¹² Marcu, A., Maratou, A., López Hernández, J. F. (2024) *EU carbon price: regulatory intervention, economic cycle, market fundamentals*.

This trend reversed through the course of 2023 and first quarter of 2024, as UKAs traded below EUAs with an average price difference of 43%. UK ETS allowance prices dropped considerably during the second half of 2023, with an average price difference of 67% compared to EU ETS allowance prices. However, UKA prices have stabilised while EUA prices have significantly dropped. In 2023, weak power demand, driven lower by declining manufacturing figures, contributed to a sharp decrease in UKA prices.

3.2.1.2. UK ETS reforms following recent EU ETS developments

The UK government is considering changes on sectoral coverage, free allocation, and CBAM. The UK ETS Authority published its final response to a public consultation in June 2023 and took a number of key decisions on the continuation of the UK ETS:¹³

- Aligning the UK ETS cap with a net-zero-consistent trend by reducing the total amount of allowances over the period 2021-2030 by 30% with a rebasing of the cap in 2024.
- Smoothing the transition to the net-zero cap through the release of 53.5 million additional allowances from the reserve to the market between 2024 and 2027.
- Increasing the industry cap from 37% to 40% of the overall cap from 2024.
- Setting aside 29.52 million allowances for future market management (equivalent to 3% of the cap).
- Implementing technical changes to free allocation, with targeted changes to benchmarks and carbon leakage for specific stakeholders in the malt extract and lime sectors.
- Phasing-out of aviation's free allocation in view of the 2026-2030 allocation period.
- Expanding the scope of the scheme to include domestic maritime transport by 2026 and energy from waste and waste incineration in 2028.
- Incorporating Greenhouse Gas Removal (GGR) technologies, subject to further consultation, a robust MRV regime, and high-quality nature based GGRs.

In December 2023, the UK ETS Authority completed the first phase of an evaluation to understand the effectiveness of the scheme's implementation, the early outcomes, and its longer-term impacts.¹⁴

3.2.1.3. UK CBAM

In March 2023, the UK government announced that it will implement a CBAM by 2027, one year after the EU CBAM becomes fully operational.¹⁵

The UK CBAM will apply to imports from the aluminium, cement, ceramics, fertiliser, glass, hydrogen, and iron and steel sectors, broader than EU. CBAM will apply to both the indirect and direct embodied emissions. Unlike the EU CBAM, it will not include electricity. In March 2024, the UK Government published a consultation report on the introduction of a UK CBAM, including proposals for its design and administration.¹⁶ Following this consultation, the government will prepare primary legislation.

3.2.1.4. Possibility of linking the UK ETS with the EU ETS

The EU-UK Trade and Cooperation Agreement foresees cooperation between the EU and the UK on carbon pricing, giving serious consideration to linking their respective ETSs.¹⁷ Despite small differences, the two systems are almost identical. Linking both ETSs would lead to carbon price convergence, exempt exporters from CBAM, and lower their cost of decarbonisation.

However, with UK ETS and EU ETS prices diverging over 2023 and 2024, and in light of the recent reforms, linkage is perceived as less likely. The EU CBAM could have an impact on UK exporters if the price differential

¹³ UK Government (2023) [Developing the UK Emissions Trading Scheme: Main Response](#).

¹⁴ UK Government (2023) [Evaluation of the UK Emissions Trading Scheme: Phase 1 report](#).

¹⁵ UK Government (2023) [Addressing carbon leakage risk to support decarbonisation: Summary of consultation responses and government response](#).

¹⁶ UK Government (2024) [Introduction of a UK carbon border adjustment mechanism from January 2027: Consultation report](#).

¹⁷ European Commission (2021) [The EU-UK Trade and Cooperation Agreement](#).

between EUAs and UKAs persists. As a result, UK entities could end up having to pay considerable sums to export to Europe.¹⁸ The longer the lack of agreement persists, the more difficult it will be to link the EU ETS and the UK ETS, especially if prices remain substantially different for an extended period.¹⁹

3.2.2. Linking with other emissions trading systems

EU ETS linkage with the Swiss ETS

The EU ETS and the Swiss ETS have been linked since 2020, meaning that allowances issued in one ETS can be surrendered for emissions generated in either of the two ETSs. The inclusion of aviation in the linking agreement was a crucial requirement for the EU.²⁰

Swiss entities are far more likely to use allowances generated in the EU ETS than EU entities are to use allowances generated in the Swiss ETS. This is expected, as the EU ETS is larger and generates more allowances.

Table 3.3 shows that aircraft operators in both systems leverage the linkage much more than stationary installations. In 2022, 67% of allowances surrendered by airlines in Switzerland were generated in the EU, compared to 6% of EUA allowances surrendered by Swiss stationary installations.

Table 3.3: EU ETS allowances used for 2022 compliance in Swiss ETS (% of total)²¹

		EU ETS general allowances	EU ETS aviation allowances	Swiss ETS general allowances	Swiss ETS aviation allowances
EU ETS	Stationary installations	99.61%	0.35%	0.03%	0.01%
	Aviation operators	38.60%	60.58%	0.08%	0.74%
Swiss ETS	Stationary installations	6.16%	-	93.43	0.41%
	Aviation operators	6.89%	60.74%	0.07%	32.30%

Source: Compass Lexecon, based on European Commission data.

3.2.3. Article 6 of the Paris Agreement

Article 6 of the Paris Agreement, which covers international carbon markets and other cooperative approaches, will need political support if parties are to meet their commitments, or significant change in economic circumstances. The United Nations Framework Convention on Climate Change (UNFCCC) COP28 in Dubai has not delivered substantial developments in this respect.²²

Since 2020, EU ETS participants cannot use international credits for compliance. There is a very low-intensity discussion regarding the integration of international credits in the EU ETS, but the topic warrants being explored, especially given the EU's position as a leading advocate for the Paris Agreement.

¹⁸ Energy UK (2023) [Without linking emissions trading systems, UK companies face higher bills and red tape: Briefing](#).

¹⁹ Lowe, S. & Low, J. (2023) [UK and EU Emissions Trading Schemes – drifting in different directions?](#)

²⁰ European Commission (2023) [Report from the Commission to the European Parliament and the Council on the functioning of the European carbon market in 2022](#).

²¹ European Commission (2023) [Commission staff working document accompanying the Report from the Commission to the European Parliament and the Council on the functioning of the European carbon market in 2022](#).

²² Carbon Brief (2023) [COP28: Key outcomes agreed at the UN climate talks in Dubai](#).

4. Environmental delivery

The EU ETS needs to be seen as an instrument to deliver price discovery within the scarcity created by the cap on GHG emissions. If the EU ETS is to be successful, its environmental delivery, or delivery against the cap, is key.

In the following chapter we look at a number of KPIs to understand if the EU ETS is delivering. This delivery must be seen as multi-faceted. The ETS needs to be assessed for its delivery in the trading period, as well as for its contribution to achieving the EU's long-term climate change objectives.

4.1. Delivery against Phase 4 target

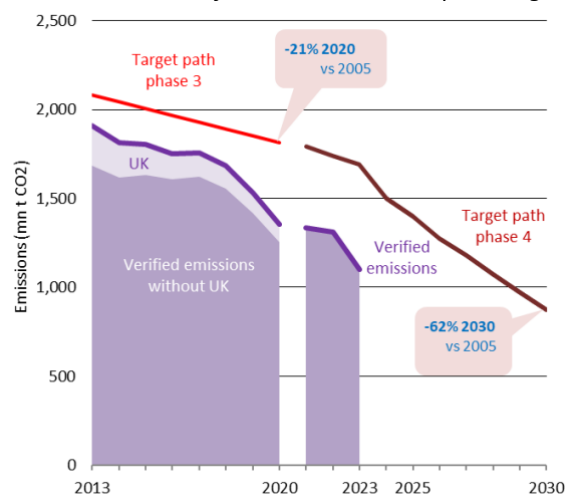
4.1.1. KPIs on data for 2023

2023 stands out as an exceptionally significant year for the EU ETS, marking a 16% reduction in emissions – the most substantial decrease since its inception in 2005. In 2023, emissions from EU ETS-covered installations were affected by different factors, while the decline in industrial emissions largely due to reduced industrial production caused by high energy costs.²³

KPI 4.1 prompts several observations. First, emissions are significantly lower than the target cap. Second, there has been an accelerating decrease in overall emissions since 2019. Notably, as of 2023, 49% of the targeted 62% reduction by 2030 has already been achieved. Recent major developments in the EU ETS include the UK's departure in 2020 and modifications to the objectives for the fourth trading period in 2023.

The emissions dynamics by sector (KPI 4.2 and KPI 4.3) reveal that from the beginning of the third trading period in 2013 to 2023, total emissions have decreased by 41%. This reduction is attributed to a 23% decrease in industrial emissions and a 51% decrease in emissions from combustion.²⁴ The emission reductions in the industry sector are the result of a combination of reduced output and efficiency gains.²⁵

KPI 4.1: EU ETS verified emissions vs adopted targets



Source: Wegener Center, based on EUTL (2024), EEA (2023)

KPI 4.2: Verified emissions vs target cap

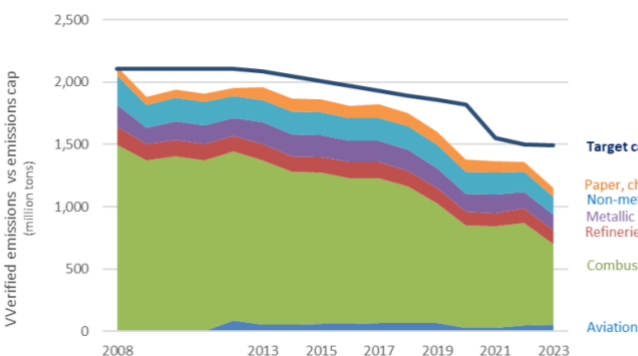
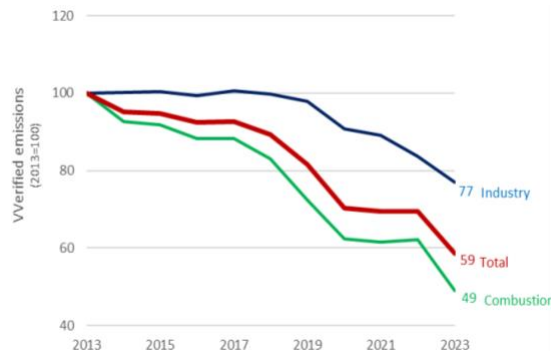


Figure 4.3: Dynamics of emissions in industry and combustion sectors



Source: Wegener Center, based on EUTL (2024), EEA (2023)

²³ Agora (2024) *Germany's CO₂ emissions drop to record but reveal gaps in country's climate policies*.

²⁴ Combustion of fuels (EUTL code 20) includes both power sector utilities and combined heat and power (CHP) in industry.

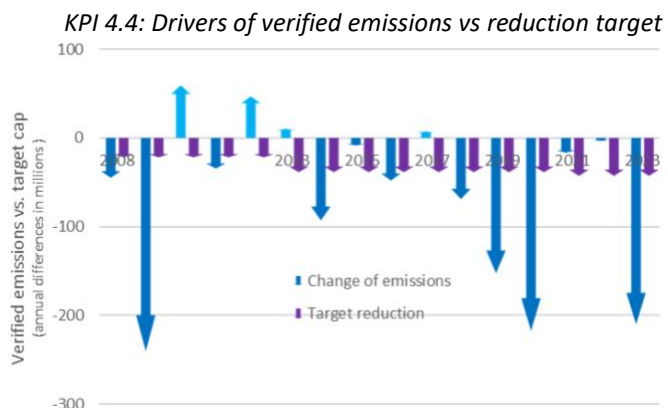
²⁵ European Commission (2024) *Record reduction of 2023 ETS emissions due largely to boost in renewable energy*. April 3rd.

There is a disparity between combustion, today accounting for around 63% of overall EU total emissions share and reducing at a quicker pace, and the industrials, responsible for 33% of total emissions. Aviation operators contribute to 4% of the emissions share.

KPI 4.4 sheds light on the underlying factors influencing these emission trends. For stationary installations, the most significant reduction periods were observed during the financial crisis of 2009, the COVID pandemic in 2020, and the energy crises in 2023.

In terms of changes vs annual target, 2023 witnessed the largest decrease, at 15%. This eclipses the corresponding cap reduction, induced by the stated LRF target of -2.2% (43 Mt CO₂) between 2022 and 2023. These numbers compare with a 14% reduction in 2020 (with an LRF of 1.74%), and an 11% reduction in 2009 compared to 2008. Notably, since Phase 3, verified emissions have outperformed the LRF induced targets set into the EU ETS Directive in 2014, 2016, 2018, 2019, 2020, and 2023.

Table 4.1 analyses the drivers of the decrease in CO₂ emissions from power generation in 2023 compared to 2022. There were remarkable displacements in the electricity mix, with solar, wind, and hydro largely compensating the decrease in use of natural gas and coal. The other factor that contributed to this considerable emissions reduction is the decrease in total electricity generation, which can be attributed to the economic crisis and energy efficiency gains. Trends in 2023 seem to be within the range of decarbonisation scenarios published by the EU power sector, but this trend will have to be confirmed by future evolution of power sector emission.²⁶



Source: Wegener Center, based on EUTL (2024), EEA (2023)

Table 4.1: Power generation data and changes 2022-2023

	Generation in 2023 (TWh)	Relative change 2022/2023 (%)	Share in the electricity mix in 2023 (%)	Change of share in mix 2022/2023 (%)
Solar	246	+17	9	+2
Wind	475	+13	18	+6
Coal	333	-26	12	-4
Gas	452	-15	17	-3
Hydro	317	+15	12	+2
Nuclear	619	+1.5	23	+1
Bioenergy	153	-7.6	6	+0

Source: Ember (2023), Global Electricity Report

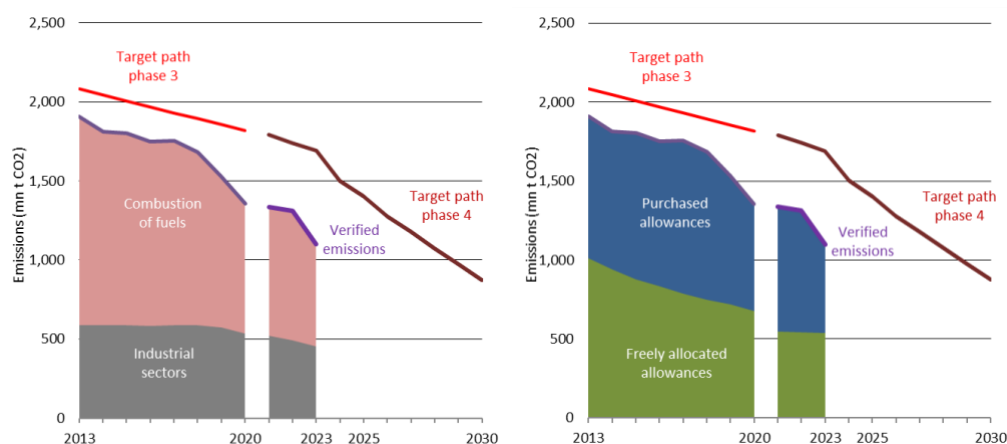
4.1.2. Impact on Phase 4 and future implications

The revision of the EU ETS Directive has increased the stringency of the EU ETS. Considering the projected emissions and target paths for Phase 4, the following observations can be made:

- Given the emission profile of recent years and foreseeing a cyclical economic rebound after the energy crisis, EU ETS emissions might soon hit the target paths for Phase 4.
- Historically, emissions reductions in the EU ETS have predominantly come from the combustion sector. This year, however, there is a notable decline in industrial emissions compared to the previous year. It will be crucial to monitor future emission trends to verify this shift and understand the real drivers behind it. Reduced emissions due to a drop of output activity, could be a real concern.
- The cap will bring more stringency up to 2030 and free allocations will become increasingly scarce, which will affect industry.

²⁶ Eurelectric (2018) [Decarbonisation pathways: Full study results](#), EU electrification and decarbonisation scenario modelling, pp 53; Eurelectric (2008) *Power Choices Pathways to Carbon-Neutral Electricity in Europe by 2050*.

KPI 4.5: Projected emissions and target paths for Phase 4



Source: Wegener Center, based on EUTL (2024), EEA (2023)

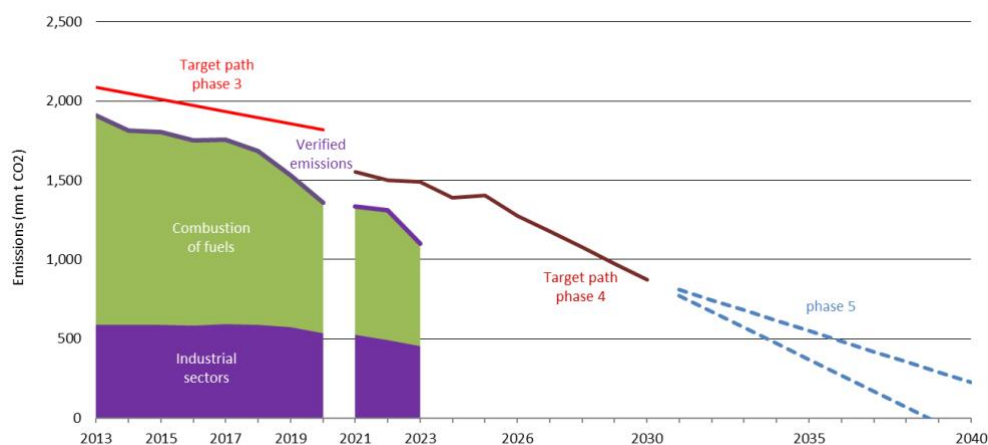
Verified emissions can be further disaggregated by macro-sector and type of allowance allocation. As shown in KPI 4.5, the combustion sector displays a declining trend in emissions that has accelerated since 2019. In contrast, the industrial sector began its decline later and exhibits a more gradually decreasing trend.

In terms of the type of allowance allocation, the EUAs to be surrendered for compliance originate from either free allowances or purchases. Starting in 2013, the quantity of free allocations has been progressively reduced. This trend is set to accelerate even more from 2026 for CBAM-covered goods, as free allocations for these goods will be fully phased out by 2034.

4.2. Delivery against EU long-term domestic environmental commitments

The EU ETS has successfully met its environmental objective of maintaining emissions below a specified target cap. Yet despite the remarkable 2023 emissions reduction, it is crucial to evaluate the longevity and replicability of this achievement without compromising economic and social priorities. To what extent does the trading period target contribute to the EU's achievement of its longer-term goals? KPI 4.6 indicates a possible corridor of paths for the EU ETS after 2030: from a zero-emission target one year before 2040 to a zero-emission target in 2050.

KPI 4.6: Possible long-term target paths for EU ETS after 2030



Source: Wegener Center, based on EUTL (2024), EEA (2023), European Commission (2022)

Until late 2019, Roadmap 2050 and the communication ‘A Clean Planet for all’²⁷ were the main documents mentioning intermediate GHG reduction targets for the EU as a whole. The entry into force of the European Climate Law in 2021, in addition to political pledges, further indicates that the EU intends to achieve net zero emissions by 2050. More recently, in February 2024, the Commission published a proposal, still to be enshrined in law, to set the EU 2040 emissions target at -90% compared to 1990.

The EU ETS contribution, as currently envisaged, still raises many questions on the future definition of its parameters. The LRF value after 2030, the integration of negative emissions, and the international linking through Article 6 of the Paris Agreement are just some examples.

5. Socio-economic delivery

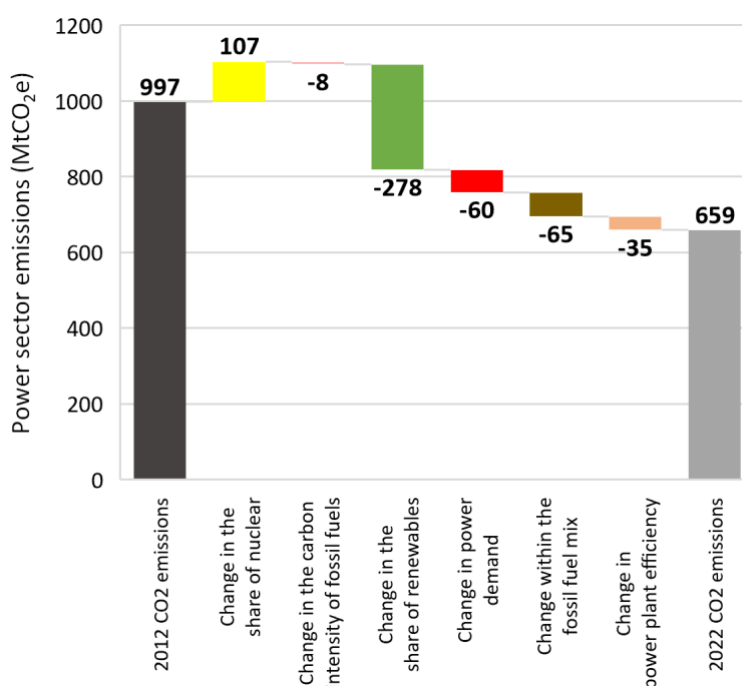
5.1. Is the EU ETS a driver for change?

Various factors affect the level of emissions and emissions reductions, such as energy prices, technological development, and interacting policy initiatives. As a result, it is difficult to determine the specific contribution of the EU ETS to overall EU emissions reductions.

In this report, for the power sector, we use the Log Mean Divisa Index (LMDI) methodology²⁸ to estimate the long-run contributions of a set of pre-defined factors to annual changes in power sector emissions.

KPI 5.1 shows that annual emissions in the power sector fell by around 340 MtCO₂e net between 2012-2022 (increased share of nuclear in the power mix outweighed by other factors). The increased change in the share of renewables was the main factor of the absolute reduction (438 MtCO₂e), being responsible for almost 63% of this change. Reduced power demand (60 MtCO₂e) – mainly from industry sectors – and changes within the fossil fuel mix (65 MtCO₂e)²⁹ were responsible for around 28% of the 438 MtCO₂e reductions, which is a significant development.

KPI 5.1: Drivers of variation in EU power sector GHG emissions (2012-2022)



Source: Compass Lexecon, based on I4CE-EcoAct methodology and Eurostat data

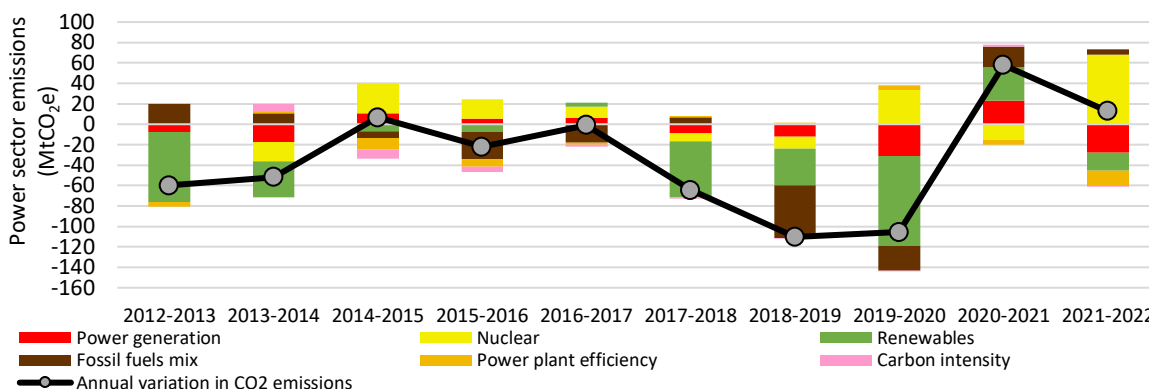
²⁷ European Commission (2018) *Communication from the Commission ‘A Clean Planet for all’: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy*.

²⁸ The LMDI methodology is developed by Ang, B.W. (2005). The analysis in this report is based on the methodology applied to EU power sector emissions by I4CE (2018) and EcoAct (2023). Input data is sourced from Eurostat.

²⁹ ‘Change in the carbon intensity of fossil fuels’ refers to the variation in GHG emissions released per kWh of electricity produced using fossil fuels (improved fuel quality in transformation) while ‘Change within the fossil fuel mix’ infers mainly fuel switching from coal to gas.

KPI 5.2 zooms in on the annual contribution of each factor, and covers the whole power sector, not only power installations in the EU ETS. Notwithstanding the complexity of isolating the EU ETS' impact in spurring a decline in emissions, over Phase 3 and the start of Phase 4 – during which EU ETS ambition was enhanced – power sector emissions fell primarily due to an increase in renewables and a switch from coal to gas; reductions in demand for electricity also contributed.

KPI 5.2: Energy source vs annual drivers of variation in EU power sector GHG (2012-2022)



Source: Compass Lexecon, based on I4CE-EcoAct methodology and Eurostat data

While carbon prices can only reach a certain limit before they trigger societal and Member State reactions, energy prices are driven by global markets, even considering the recently imposed emergency measures. The role of the EU ETS as a driver for change has now increased due to the closer interaction between energy and carbon markets from both a legislative and market point of view. Its importance as a key mechanism to secure long-term decarbonisation of the power sector should be confirmed in Phase 4 with a more stringent cap.

5.2. Social impacts

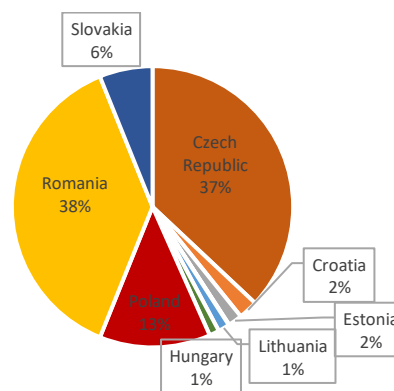
When assessing the social impacts of the EU ETS, one approach entails tracing how EU ETS revenues are allocated. This involves examining if these funds are directed towards the redeployment, reskilling, and upskilling of the workforce, or if they are invested in education, job-seeking programmes, and start-ups.

5.2.1. Modernisation Fund

Operational as of January 2021, the Modernisation Fund³⁰ is designed to support decarbonisation in Central and Eastern European Member States. Since its inception, there have been six biannual calls.³¹

After the last revision of the EU ETS Directive, three additional Member States with a GDP below 75% of the EU average in 2016-2018 (Greece, Portugal, and Slovenia), were introduced as new possible beneficiaries.

Figure 5.3: Distribution of funding % received from the Modernisation Fund, per Member State (2021-2023)



Source: ERCST, elaboration based on disbursement decisions

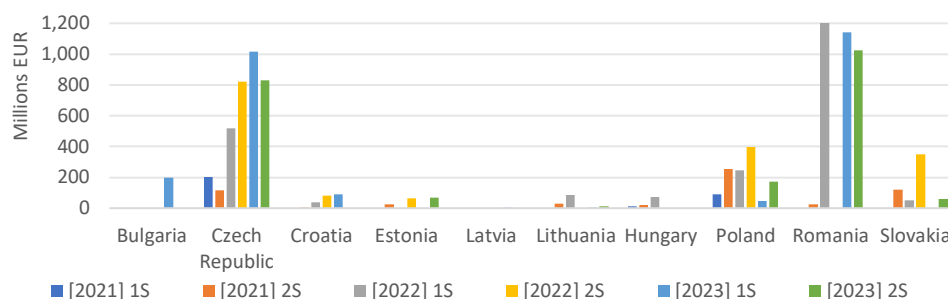
³⁰ Consolidated text: Commission Implementing Regulation (EU) 2020/1001 of 9 July 2020 laying down detailed rules for the application of Directive 2003/87/EC of the European Parliament and of the Council as regards the operation of the Modernisation Fund supporting investments to modernise the energy systems and to improve energy efficiency of certain Member States.

³¹ Modernisation Fund Disbursement Biannual Decisions are available at: https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/modernisation-fund_en

In 2023, two disbursement decisions were made:

- In the first biannual disbursement decision,³² multi-annual schemes were approved for a total volume of EUR 2.3 billion.
- In the second biannual disbursement decision,³³ multi-annual schemes were approved for a total volume of EUR 2.1 billion.

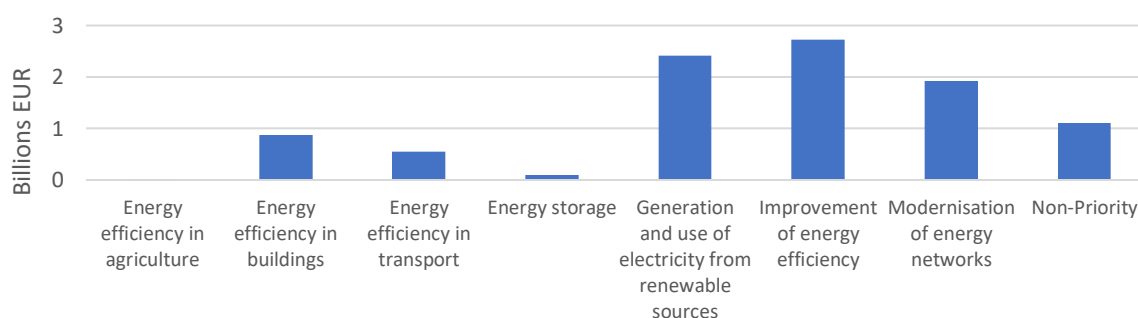
Figure 5.4: Total funding received from the Modernisation Fund per Member State (2021-2023)



Source: ERCST, elaboration based on disbursement decisions

Figure 5.4 displays the biannual evolution of funding received per Member State, covering all six disbursement decisions. Since its creation in 2021, the total disbursement of the Modernisation Fund has amounted to more than EUR 9.4 billion. Romania and Czech Republic have been the main beneficiaries, receiving around EUR 3 billion each, followed by Poland, which has received around EUR 1 billion.

Figure 5.5: Modernisation Fund investments by area, as reported by Member States (2021-2023)



Source: ERCST, elaboration based on disbursement decisions

Figure 5.5. unpacks the Fund's investments per area, as reported by Member States. Priority areas are those aligned with Article 10d (2) of the Directive 2003/87/EC, while non-priority areas are those not aligned (e.g. projects using natural gas) but that can still get access to funding under specific conditions.³⁴

Looking at the 2021-2023 data, most of the funding has been targeted towards improving energy efficiency (EUR 2.7 billion) and the generation and use of electricity from renewable sources (around EUR 2.4 billion), followed by modernisation of energy networks (EUR 1.9 billion).³⁵ Non-priority disbursements still account for

³² Commission Decision C(2023) 3643 on the disbursement of revenues from the Modernisation Fund under Directive 2003/87/EC of the European Parliament and the Council - First biannual disbursement cycle of 2023 and Annex.

³³ Commission Decision C(2023) 9054 on the disbursement of revenues from the Modernisation Fund under Directive 2003/87/EC of the European Parliament and the Council - Second biannual disbursement cycle of 2023 and Annex.

³⁴ A maximum of 20% of the Modernisation Fund can be used to support non-priority investments.

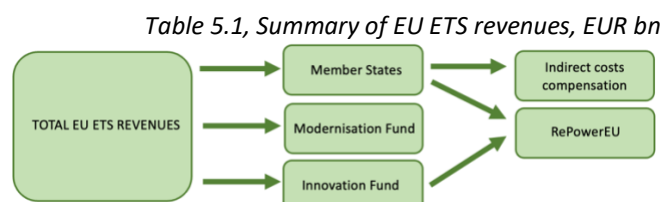
³⁵ In some cases, Member States report multiple priority areas for a single project. In these cases, we assigned a single priority area based on the project description. Projects covering more than one priority area amounted to a total of EUR 2,126,394,856, more than 20% of the Fund.

a substantial amount (11.43%) of the total envelope. Importantly, no priority proposals have yet been reported under 'just transition', the fifth priority area.³⁶

Overall, the Modernisation Fund is a good example of the challenges that remain to measure the social impact of the EU ETS. However, greater emphasis should be placed by policymakers on quantitatively understanding the social impacts and employment lost due to relocation of EU industry abroad.

5.2.2. Auction revenues and use

EU ETS allowances are by default allocated via auctioning by Member States. The revenues thereby collected and reported in this chapter accrue to three separate pots: a) Member States budget (including indirect compensation), b) Innovation Fund, and c) Modernisation Fund. As specified in section 3.1.2, the EU ETS funding to RePowerEU comes from pots a) and b). As shown in Table 5.1, of the total EUR 130 billion collected by the System, EUR 114 billion (87.5% of total) accrued to MSs excluding 2023, EUR 9.7 billion (7.5%) went to the Modernisation Fund, and EUR 6.6 billion (5%) to the Innovation Fund.³⁷

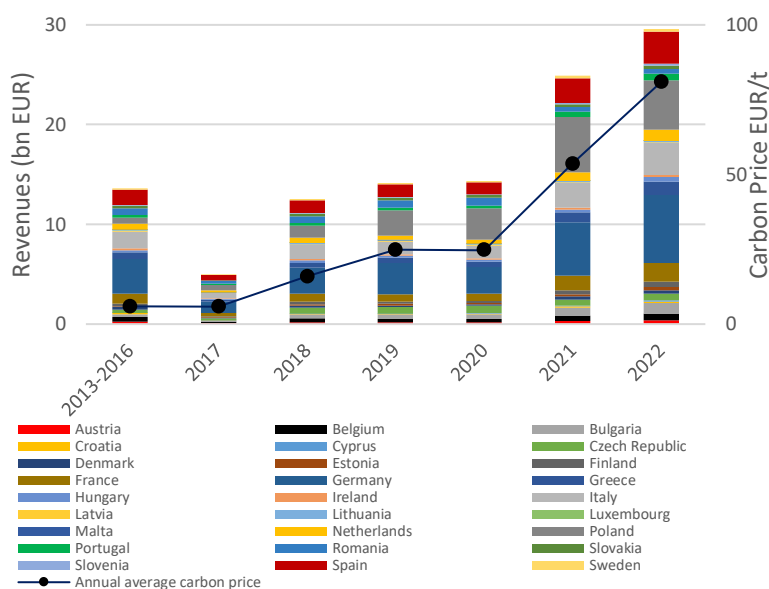


Source: ERCST based on EEA and EC

KPI 5.6 displays EU ETS reported auction revenues by EU Member States (2013-2022) in comparison with the carbon price. 2017 is the first year for which revenues are reported annually.³⁸ In 2017, the Member States reported EU ETS revenues of nearly EUR 5 billion, compared to over EUR 29 billion in 2022. This represents an increase of around 83% in EU ETS revenues collected by Member States over five years.

The data also show that EU ETS revenues are highly correlated with the evolution of the carbon price. Focusing on the last year for which Member States reported revenues, in 2022 Germany, Poland, and Spain were the top three Member States by collected revenues (6.8, 4.9, and 3.2 EUR billion

KPI 5.6 EU ETS MS reported auction revenues EU 27 vs carbon price (2013-2022) (bn EUR)



Source: ERCST, based on Reportnet dataflows and EU Climate Action Progress Report 2023

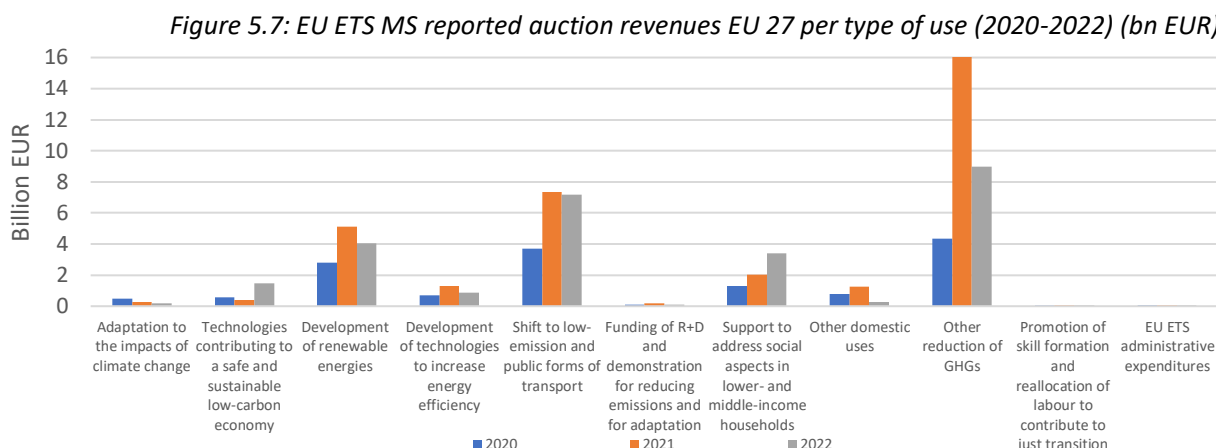
³⁶ Art 10d (2) (f) of the EU ETS Directive. In fact, we only found one project (ref. MF 2021-2 CZ 0-002) where only an explicit reference to just transition is mentioned. The requested amount for this project was EUR 30 million.

³⁷ Energy Post (2024) [EU Carbon Prices halved in a year. But they should rise again.](#)

³⁸ European Commission (2023) [Climate Action Progress Report 2023](#), Table 9; Reportnet (s.d.) [Use of ETS auctioning revenues - Reporting year \(2023, 2022, 2021\).](#) <https://reportnet.europa.eu/public/dataflows>

respectively). In addition to KPI 5.6, around EUR 8 billion went to the Modernisation and Innovation funds (see subchapter 5.4).

Figure 5.7 shows the breakdown of Member State revenues by type of use for the last three years for which data is available.³⁹ For the whole analysed period, most of the revenues have been recycled into the ‘other reduction of GHGs’ category (39.79%). Examples of the latter include ocean-related projects (Italy), local climate projects (Belgium), electric mobility in public administration (Poland), biodiversity (Spain), and



Source: ERCST, based on use of EU ETS auction revenues (reporting years 2021, 2022, 2023), GovReg, EEA

buildings and urban technologies (Latvia). The category ‘shift to low-emission and public forms of transport’ has also been an important recipient (23.81%), followed by ‘development of renewable energies’ (15.65%).

Regarding the ‘support to address social aspects in lower- and middle-income households’ category,⁴⁰ 2022 confirmed and reinforced the upward trend in revenue allocation that started in 2021. Similarly, ‘technologies contributing to a safe and sustainable low-carbon economy’, e.g. technical support to farmers and agricultural research, also benefitted from increased revenues in 2022. This analysis yields two significant insights:

- Less than 9% of the total EU ETS revenues are allocated towards addressing social concerns, such as skills development and the reallocation of labour. Additional funds, including energy bills’ support, may come from MSs’ general budgets, complicating a comprehensive assessment of total support received in these areas.
- Available data do not allow determining the exact share of ETS revenues Member States are recycling back into EU ETS-covered sectors. As an indicative lower bound of this figure equals the revenues used in ‘development of clean technologies to increase energy efficiency’ and ‘EU ETS administrative expenditures’, representing 4% of total MS revenue recycling.⁴¹ Additional funds expressly dedicated to ETS-covered sectors include indirect compensation and Innovation Fund budget.

5.2.3. Indirect compensation

According to 2023 self-reported data from Member States,⁴² the average percentage of auction revenues spent on indirect costs compensation to address carbon costs passed through by electricity generators in 2022 was

³⁹ Reporting data in Bulgaria, Estonia and Hungary in 2022 is restricted from public view, while no data is reported for the Netherlands. In their reports, Member States can indicate multiple categories, in which cases the revenues for those categories are split in equal amounts for this figure.

⁴⁰ Other domestic uses such as support to ETS implementation (Poland), energy bill (Latvia), State aid (Slovakia), and industrial support (Italy).

⁴¹ From areas ‘development of clean technologies to increase energy efficiency’ (Art 10(3g)) and ‘EU ETS administrative expenditures’.

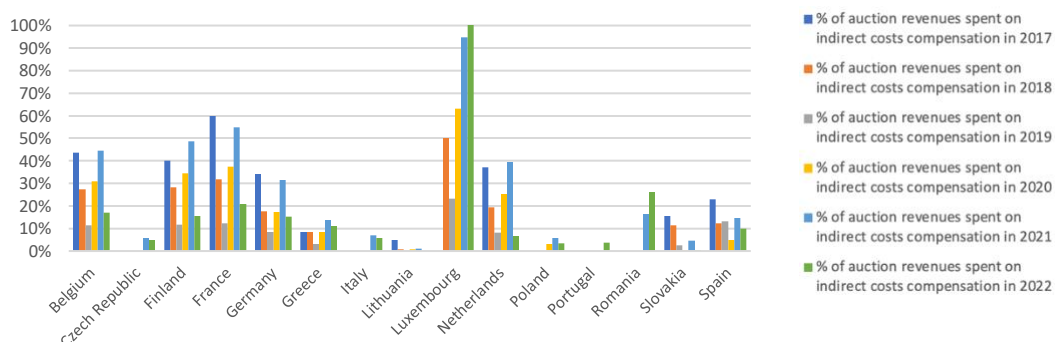
⁴² The European Commission publishes the annual Report on the Functioning of the European carbon market by the end of the year. The last report was published in October 2023 and includes compensation paid out in 2022 for indirect costs incurred in 2020. COM(2023) 654 final.

21.8%. The Commission approved State aid to mitigate the indirect costs of the EU ETS in energy-intensive industries in 14 Member States in 2022 (KPI 5.8), including a new compensation scheme approved in Portugal.⁴³

The total indirect costs compensation paid by Member States in 2017-2022 amounted to EUR 7.64 billion, of which EUR 2.183 billion was in 2022 alone. The 2022 amount is EUR 198 million less than that paid in 2021, but EUR 1.5 billion more than in 2017. The carbon price used to calculate the amounts paid out in 2022 for indirect costs incurred in 2021 was 25.09 EUR/tCO₂e, up from the 25.20 EUR/tCO₂e used for 2020.⁴⁴

Luxembourg (164.38%),⁴⁵ followed by Romania (26.24%), France (20.76%) and Belgium (16.95%), were the Member States with the highest share of auction revenues spent on indirect costs compensation in 2022.

KPI 5.8: % of auction revenues spent on indirect costs EU 27 (2017-2022)



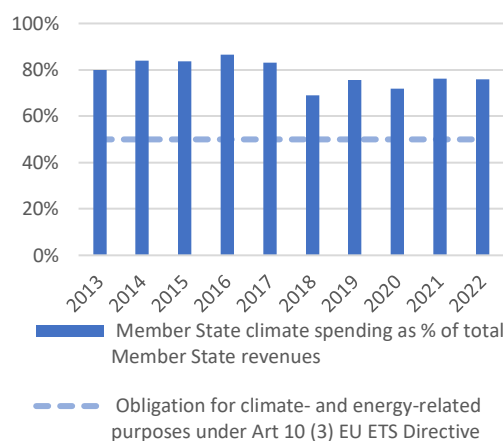
Source: Reports from the Commission on the functioning of the European carbon market

Box – Auction revenues spent on climate and energy objectives

To evaluate the efficiency of EU ETS auction revenues, it is possible to benchmark revenue use against a specific target. Until the last revision of the EU ETS Directive, Art 10 (3) stipulated that Member States must allocate at least 50% of the auction revenues to climate- and energy-related purposes. As shown in KPI 5.9, Member States overperformed on this target and the latter has been consistently exceeded over the entire time frame, with an average of 78.5% of total Member State EU ETS auction revenues being spent on climate and energy.

Considering that the latest revision of the EU ETS Directive doubled the target from 50% to a full 100% use of EU ETS revenues towards climate and energy objectives, Member States face the challenge of increasing their expenditure on climate and energy initiatives. As a result, the use of revenues shown previously is likely to evolve to comply with this new requirement, leading to a different overall picture in terms of areas of spending.

KPI 5.9: % of total auction revenues spent on climate, renewable energy and energy efficiency (2013-2022)



Source: EEA (2023), Use of auctioning revenues generated under the EU ETS.

⁴³ Ambiente e Ação Climática. Gabinete do Ministro. Despacho n.º 8485/2023. 22 August 2023.

⁴⁴ Calculated as the average futures price for that year registered in 2020

⁴⁵ Luxembourg's share of auction revenues spent on indirect costs in 2022 is above 100% due to a drop in the country's auction volume caused primarily by its use of ETS allowances for offsetting emissions in ESR.

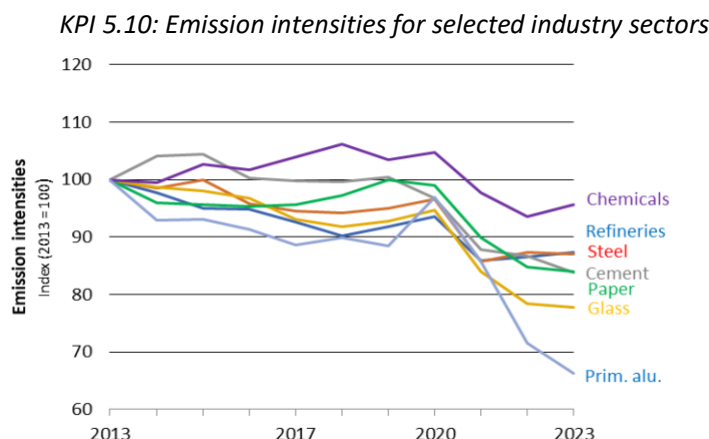
5.3. Industrial decarbonisation

5.3.1. KPI on emission intensities in selected industrial sectors

A key metric for assessing the economic delivery of the EU ETS is the emission intensity of the covered industrial sectors. This metric, calculated by dividing the volume of emissions by the corresponding weight of production activity, allows emission trends due to output to be disaggregated from those due to efficiency gains.⁴⁶ Emissions intensities is the variable that matters, as the EU objective should be to decarbonise, not deindustrialising.

This analysis reveals several clear trends:

- Firstly, there has been a notable acceleration in the reduction of emission intensities since 2020.
- Secondly, the rate of decline varies, suggesting differences in sectors' ability to decarbonise. For instance, the cement, paper, and glass sectors show faster reductions, with primary aluminium showing the most significant decline. The fall in emissions can be attributed to investment in low-carbon projects, while production declines is a serious concern for sectors like steel and chemicals.



Source: Wegener Center (2024), based on EUROSTAT STS and EUTL

Box – Decarbonisation trends vs sectoral roadmaps.

A way to understand how well sectors are performing is to compare their actual performance against announced sectoral targets, while noting that not all sectors have sectoral targets in place.⁴⁷

Sectoral targets of -93% GHG emissions by 2050 (vs 2021) have been announced for aluminium,⁴⁸ -30% GHG emissions by 2030 (vs 2018) for iron and steel,⁴⁹ and -30% GHG emissions by 2030 (vs 1990) for cement.⁵⁰ Achieving these targets will require maintaining annual GHG emissions reduction rates of -3.2%, -2.5%, and -0.75% respectively as an average. These are higher annual average rates than those achieved so far.

For the total industrial sector, the Commission's 2040 Climate Target Impact Assessment foresees that (energy- and process-related) CO₂ emissions should be reduced by 37%, 55% and 76%, depending on the scenario, compared to 2030.⁵¹ This corresponds to a decrease of 60-90% compared to 1990 levels, meaning an annual average GHG emissions decrease of between 1.5% and 2.25% will be necessary to achieve GHG targets.

If annual decreases continue at their current pace, the industrial sectors analysed will not succeed in achieving the -90% 2040 GHG emissions reduction target. This shows of the challenge EU industries face when setting too ambitious climate targets, which may come back to them.

Evaluating trends in emissions corresponding with the goals outlined in sectoral roadmaps presents different challenges. Industries facing difficulties in reducing emissions are currently investigating approaches such as carbon storage, and utilisation. Such efforts may take time to materialise at a scale to support industry announced targets.

⁴⁶ Important caveats of this analysis need to be pointed out. One challenge involves aligning the reported emissions data with production activity figures. Despite using the EUROSTAT STS database to find relevant production data, we recognise that these figures may not perfectly match the reported emissions.

⁴⁷ This is the case for sectors like chemicals and pulp and paper, for which no GHG sectoral targets have been announced.

⁴⁸ European Aluminium (2023) *Net-Zero by 2050: Science-based Decarbonisation Pathways for the European Aluminium Industry*, pp 41.

⁴⁹ Eurofer (2021) *Updated EU industrial policy strategy shows firm EU support for steel sector's decarbonisation efforts in post-COVID era*.

⁵⁰ Cembureau (2020) *Cementing the European Green Deal. Reaching climate neutrality along the cement and concrete value chain by 2050*, pp 11.

⁵¹ SWD (2024) 63 final - IA Part 3. Figure 55: CO₂ Emissions from industrial sector, pp 67.

5.3.2. Stringencies that translate into costs

For EU ETS installations, the stringency of the cap-and-trade is set by the legislation. A key KPI to measure the EU ETS compliance costs is the gap between the allowances allocated for free and the actual verified emissions.

To standardise this measure across different sectors, activities, and individual installations, we calculate the net supply of free allowances by dividing the gap by the verified emissions. This indicator is presented both in terms of volume – referring to the number of allowances in either a long or short position – and in terms of value, which calculates the monetary value of the positions by multiplying the volumes by the average EU ETS carbon price.

KPI 5.11: Net supply volume of free allowances – all stationary installations

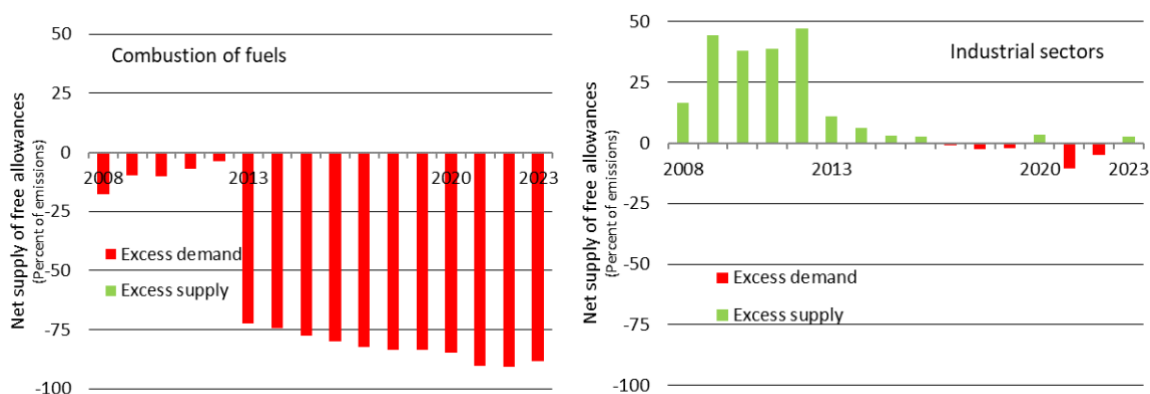


Source: Wegener Center (2024)

5.3.3. Balance of allowances

KPI 5.11 shows the net supply of free allowances for all stationary installations.⁵² The KPI shows an excess demand for allowances since 2013, which is approximately half of the emissions volume in addition to what is allocated for free. However, a significant disparity exists between sectors.

KPI 5.12: Net supply volume of free allowances – combustion and industry sectors



Source: Wegener Center (2024)

As illustrated in KPI 5.12, about 90% of emissions are not covered by free allocations in the combustion sector.⁵³ Industrial sectors, however, experienced a notable surplus of free allocations during the second trading period, significantly decreasing thereafter. The deficits since 2017 turned into surpluses in 2023 because of the sharp decrease in emissions, while this may not reflect the output destruction. The outlier in 2020 should be considered due to the impact of COVID.

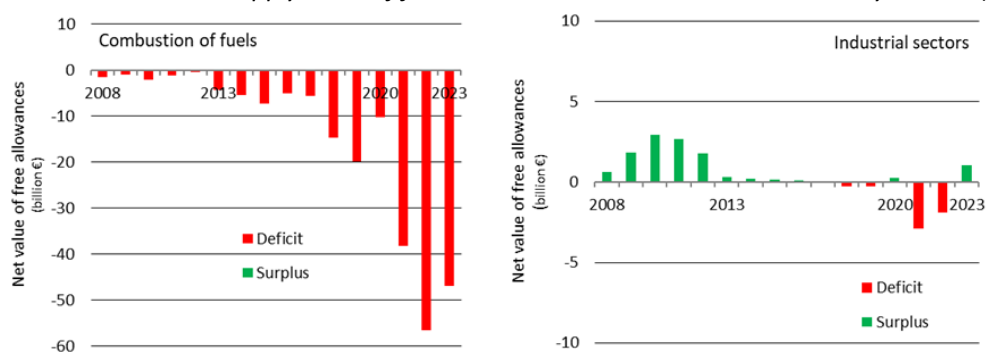
Multiplying the net supply of free allowances by the carbon price will provide us a more realistic analysis of the real cost of surrendering allowances for EU ETS installations. KPI 5.13 shows the EUA prices' impact on the purchasing costs in billion EUR. In the combustion sector, annual expenses surpassed EUR 40 billion during the fourth trading period, reaching a cost close to EUR 60 billion in 2022. For industrial sectors, the costs reached

⁵² Net supply of free allowances = (free allowances minus verified emissions) / (verified emissions) * 100

⁵³ 'Combustion of fuels' falls under EUTL code 20. The remaining activities correspond to 'All industrial installations', which are codes 21-99.

up to EUR 3 billion annually in 2021 and 2022, while 2023 saw a minor surplus. ETS cost can be passed through by combustion, but not by (trade exposed) industry.

KPI 5.13: Net supply value of free allowances – combustion and industry sectors (bn EUR)



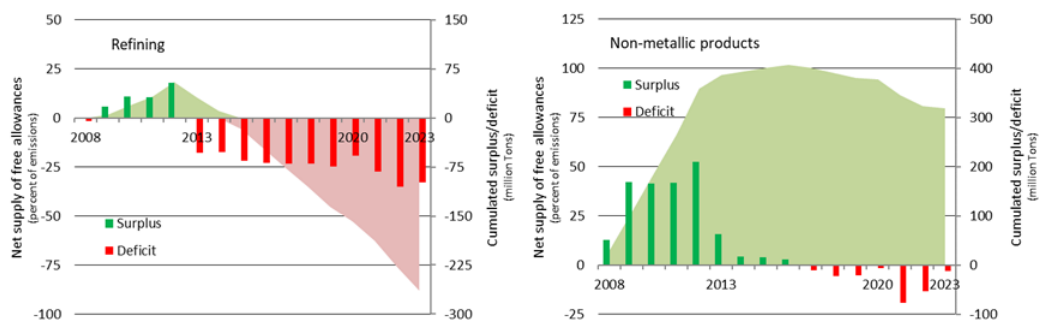
Source: Wegener Center (2024)

5.3.4 Stringencies for industrial activities

To better analyse the net supply of free allowances to industrial activities, we categorise these activities into three groups. Each group has similar emissions levels and technological characteristics. Besides the annual net volume of free allowances, we also consider their cumulative totals since 2008. Our findings in KPI 5.14 suggest that refineries⁵⁴ have faced significant deficits in free allowances since the start of the third trading period, and which remain elevated today.

In contrast, the surpluses accumulated by other industrial groups have decreased since the beginning of Phase 3. This is the case for non-metallic products (production of cement clinker, production of lime, or calcination of dolomite/magnesite, manufacture of glass, manufacture of ceramics, manufactures of mineral wool, production of processing of gypsum or plasterboard)⁵⁵, which have had a deficit of allowances since 2017. However, it is important to note that some emissions from these activities are reported under combustion activities, which do not receive free allowances.

KPI 5.14: Net supply value of free allowances – all stationary installations



Source: Wegener Center (2024)

⁵⁴ EUTL code 21

⁵⁵ EUTL codes 29-34.

5.4. Innovation

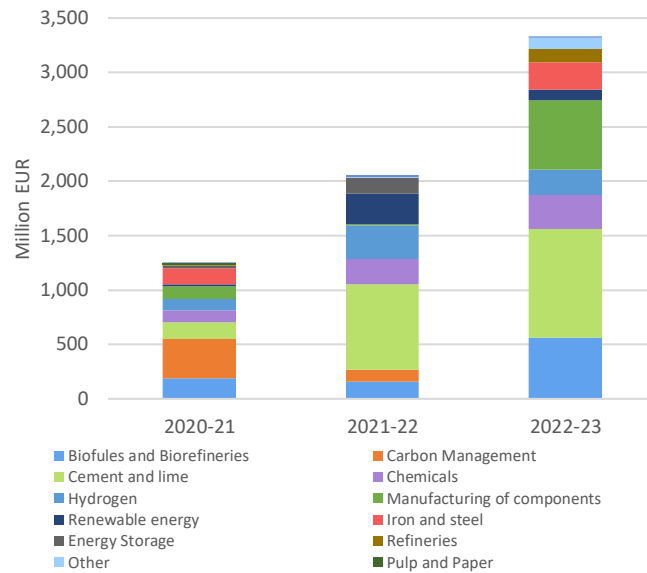
Figure 5.15 outlines the allocation of funding by sector across the past three calls of the Innovation Fund, covering a total of 106 projects. In addition to the calls for proposals, in 2023 the Innovation Fund introduced competitive bidding.

The overall funding provided by the Innovation Fund has markedly increased over time, a trend directly linked to the rising prices of carbon. Similar to last year's assessment, the cement and lime industry remains the main beneficiary, receiving almost EUR 2 billion in funding. This funding is primarily invested in CCS and CCU technologies. The 2022-2023 call saw notable increases in funding towards refineries and the iron and steel sectors.

The strong increase in funding for manufacturing of components, including renewable energy installations, electrolyzers and fuel cells, energy storage solutions, and heat pumps such as batteries and electrolyzers, in 2022-2023 should be interpreted in the context of REPowerEU and Fit for 55 which emphasise the domestic production of essential components for net-zero technologies.⁵⁶ The funding allocated to this sector in the last call amounted to EUR 638 million.

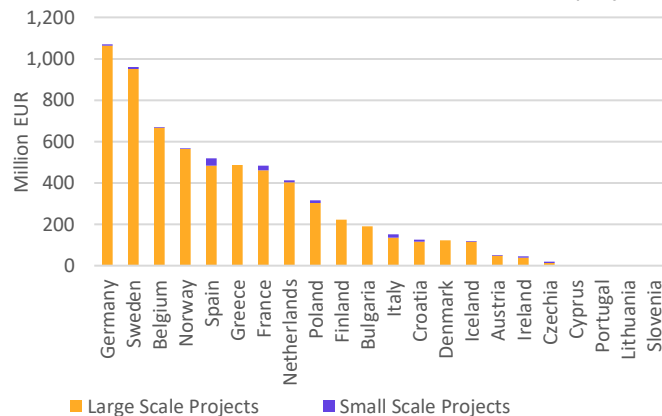
From a country-specific perspective, Figure 5.16 illustrates the distribution of total Innovation Fund funding by Member State. This reveals a concentration of funding among a few, with the top four receiving almost the same amount of funding as all other Member States combined. The data further differentiates between large- and small-scale projects, with the threshold being CAPEX costs of EUR 7.5 million.⁵⁷ Owing to their lower costs relative to large-scale initiatives, small-scale projects constitute merely 2.6% of the total funding.

Figure 5.15: Innovation Fund funding by sector and call year (2020-2023)



Source: ERCST (2024), Innovation Fund project portfolio

Figure 5.16: Innovation Fund funding by Member State and project size



Source: ERCST (2024), Innovation Fund project portfolio

⁵⁶ These encompass the Net Zero Industry Act and the Critical Raw Materials Act.

⁵⁷ As from 2024: Large-scale projects CAPEX > EUR 100 million; Medium-scale projects EUR 100 million > CAPEX > EUR 20 million; Small-scale projects EUR 20 million > CAPEX > EUR 2.5 million.

At the project level, Kairos@C, set to capture, liquefy, transport, and permanently store CO₂, is the leading recipient of Innovation Fund funding, securing EUR 357 million. Following closely are H2 Green Steel and IFESTOS, receiving allocations of EUR 250 million and EUR 234 million respectively.

Noteworthy overseas policies supporting green innovation include the Inflation Reduction Act (IRA). The IRA secures approximately \$370 billion toward tackling climate change, with a key provision being the establishment of the Advanced Industrial Facilities Deployment Program, funded at \$5.8 billion. This programme targets decarbonising investments (including retrofits) in the steel, aluminum, cement, fertilizers, paper, and chemicals sectors. Additionally, the IRA offers an investment tax credit of up to 30% of the costs for the construction of hydrogen production facilities and a production tax credit of up to \$3/kg of hydrogen produced, depending on GHG intensity. It also offers a production tax credit of \$85/tonne for CCS.

5.5. Competitiveness and carbon leakage

Historically, the EU has used free allocation and indirect costs compensation to limit carbon leakage and insulate EU industries from loss of international competitiveness due to EU ETS costs. CBAM is a mechanism that is seen as a gradual replacement for the phase out of free allocation up to 2034.

CBAM will cover goods from iron and steel, aluminium, cement, fertilisers, electricity, and hydrogen.⁵⁸ The phase-in period for the mechanism starts in 2026 for industrial sectors, with full implementation in 2034. It is important to understand the impact of this gradual replacement of free allocation by the CBAM on trade-exposed and carbon-intensive industrial sectors.

In principle, the objective of the CBAM is to ensure that the price of carbon paid by imported products is the same as that paid by EU ETS domestic producers, and to prevent the risk of carbon leakage, thereby reducing global carbon emissions and supporting the goals of the Paris Agreement. In reality, it is unclear and will be spent to interpretation on how well it is operationalised. CBAM is achieved by applying an EUA price to the carbon embedded in certain imported goods.

Assuming that EU industry is, on average, less carbon intensive than most other countries, the CBAM would raise the price of carbon-intensive imports relative to domestically produced goods, therefore limiting carbon leakage resulting from competitive pressure in the EU domestic market.⁵⁹ It will also make imports more expensive in the EU. However, as there is no solution for EU exports, exports are still vulnerable to the decrease in free allocation, without protection on the global market.

5.5.1. Cost of the phase-out of free allocation

The phase-out of free allocation by 2034 for CBAM-covered goods will have a major cost impact on the manufacturing sector. From 2026, CBAM-covered installations would incrementally lose protection. Industrial sectors will begin to face more severe carbon price exposure from 2030, as the free allocation phase-out accelerates and the gap between emissions and free allocations widens. This would lead to an increase in costs, with costs related to EUAs becoming a larger component for production based on fossil-fuelled processes.

Figure 5.17 (a) shows the breakdown of production costs for ammonia production in the EU in 2030 for the fossil-based process⁶⁰, i.e. considering hydrogen produced from Steam Methane Reforming with a cost of natural gas of around 30 EUR/MWh, and the decarbonised production process assuming a cost of 'green' hydrogen of around 5 EUR/kg (low assumption) with an increase in CAPEX to adapt the Haber-Bosch reactor.

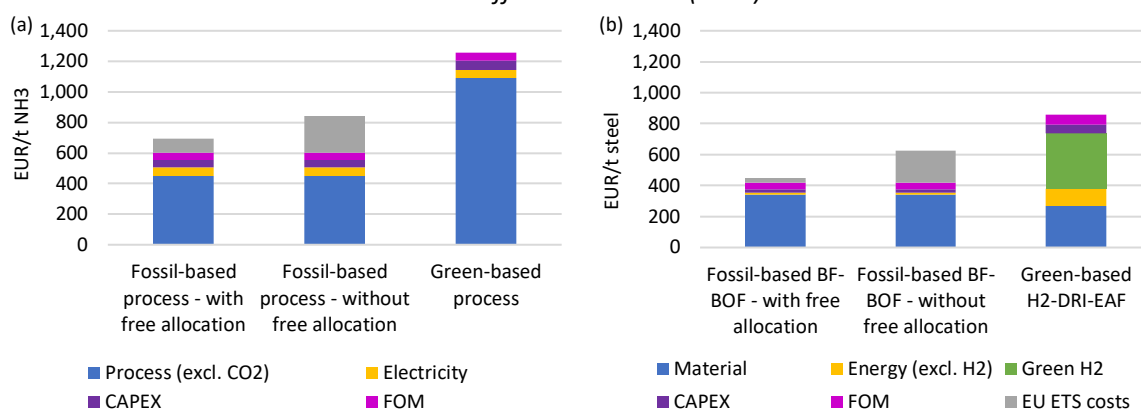
⁵⁸ Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism (Text with EEA relevance). *Official Journal L 130/52*.

⁵⁹ Carbon leakage through imports happens when it is cheaper to import goods from outside a region than produce goods in that region due to, for example, unilateral carbon pricing policies.

⁶⁰ i.e. considering hydrogen produced from Steam Methane Reforming with a cost of natural gas of around 30 EUR/MWh, and the decarbonised production process assuming a cost of 'green' hydrogen of around 5 EUR/kg (low assumption) with an increase in CAPEX to adapt the Haber-Bosch reactor.

Figure 5.17 (b) shows the breakdown of production costs for crude steel production in the EU in 2030 for the carbon intensive route⁶¹.

Figure 5.17: Production costs for fossil-based and green (a) ammonia and (b) steel by cost component under different scenarios (2030)⁶²



Source: Compass Lexecon (2024), based on data from BusinessEurope for ammonia and AgoraEnergiewende for steel
 *FOM is 'fixed operation and maintenance cost', while CAPEX is 'capital expenditures'.

Under the assumptions above, Figure 5.17 suggests the following:

- Without regulatory support, decarbonised production processes would be more expensive than carbon-intensive processes even when assuming a full free allocation phase-out: as of 2030, even when assuming green hydrogen costs in the low range, decarbonised steel would be 50% more expensive than fossil-based steel with no free allocations. Green hydrogen-based ammonia would be 40% more expensive than fossil-based ammonia with no free allocations.
- Free allocation phase-out would increase costs: the phase-out of free allocations combined with a rise in EUA prices would lead to EU ETS-related costs associated with the fossil-based production of ammonia almost tripling, resulting in a total cost increase of over 20% per ton of ammonia produced compared to the case of continued free allocation in 2030. For steel production through the fossil-based BF-BOF process, EU ETS-related costs would increase by approximately a factor of 8 in the case of no free allocation, resulting in a total cost increase of almost 40% per ton of steel produced.

As a result, EU production of steel and ammonia is likely to face an increased competitiveness gap in EU domestic markets compared other jurisdictions, mainly due to carbon costs associated with the EU ETS. Without public support or changes in the costs of low-carbon processes (whether for low-carbon energy inputs or CAPEX of new installations), free allocation phase-out alone does not provide a clear economic case for decarbonisation.

5.5.2. Impact on exports

Exports play a vital economic and environmental role for goods in the EU covered by the CBAM. Their role depends not only on the share of production exported, but other factors such as capacity utilisation levels, seasonality, and cyclical demand which look different for each sector.

⁶¹ i.e. a retrofitted blast furnace/blast oxygen furnace (BF-BOF) with a cost of coking coal of 120 EUR/t and cost of gas of around 30 EUR/MWh, and the decarbonised route, i.e. a hydrogen-based direct reduction of iron coupled with an electric arc furnace, with a cost of hydrogen of around 5 EUR/kg (low assumption) and a cost of electricity of around 110 EUR/MWh. In both figures, the price of EUAs is assumed to be 100 EUR/tCO₂e.

⁶² The fossil-based ammonia production process is based on SMR and Haber-Bosch synthesis. The fossil-based steel production process is assumed to be a retrofit BF-BOF with coking coal, while the green steel production process is based on the DRI-EAF process powered by green electricity.

Because CBAM-covered goods are largely traded in highly competitive global commodity markets, the possibilities to pass through costs are limited. If exports are not competitive due to a higher carbon price and lose this share of production, plants may end up operating at a suboptimal capacity. At suboptimal capacity utilisation rates, plants struggle to cover fixed costs, leading to reduced profitability and financial strain. Failure to find a solution may eventually lead to decisions to close plants that are no longer profitable.

The extent to which – in the absence of any sort of mechanism for export rebate – EU ETS reform and CBAM impact the ability of EU industry to compete on international markets can be estimated by looking at two representative products. The results found that, under certain assumptions,⁶³ producers of cold-rolled steel would feel only marginal impacts in the early years of EU ETS reform and the phase-out of free allocation. By 2030, cost increases would be enough to translate into real impact, with premiums of 18% over global prices.

By 2034, when the CBAM takes full effect, those premiums would be 35%. At rates of difference like this, there would be no export markets for those products. With steel factories having to run at capacity rates over 75% to be economically viable, a loss of export markets could push some installations closer or past these limits.

The same result was found for Calcium Ammonium Nitrate (CAN).⁶⁴ Starting with marginal impacts, by 2030 there would be a cost premium of 27% over global prices, and by 2034, that would increase to 49%. As in the iron and steel sector, this translates into essentially an extinction of global markets for this product. As fertilizer producers depend on exports during winter to operate at optimal capacity utilisation rates, losing the winter exports would not just mean losing export markets; it would actually impair the survival of their operations.

6. Market functioning

6.1. Market functioning trackers

The role of a market is to provide good price discovery, which making good market functioning essential. Good market functioning includes active participation in auctions as the source of primary supply, liquidity in the secondary market, ease of access to the market, and availability of data.

This chapter looks at eight KPIs every year to assess how well the market is functioning. While useful by themselves, it is crucial to put the indicators into context with historical developments and market sentiment in order to provide a picture of how the market is operating, and whether it is improving or worsening compared to previous years.

The EU ETS was stable in 2023, particularly compared to the turbulent 2022. EU lawmakers finalised reforms after two years of back-and-forth negotiations, providing market certainty. Meanwhile, the recovery from the wider energy crisis was also a contributing factor to the EU ETS settling back into a rhythm. This resilience has reinforced the market’s efficacy as a decarbonisation policy tool and helped to provide a reliable price signal. However, the lack of volatility and disruption appeared to dissuade some participants, as open interest dropped, and traded volumes and auction participation steadied.

Table 6.1: Market functioning trackers

Indicator	2021/2022	2022/2023
Volume		
Open interest		
Auction participation		
Auction coverage		
Auction versus spot spread		
Cost of carry		
Ask-bid spread		
Volatility		

Source: BloombergNEF

Note: Green indicates improving, red worsening, amber stable.

⁶³ Marcu, A. et al. (2024) *Review of Carbon Leakage Risks of CBAM Export Goods*. ERCST.

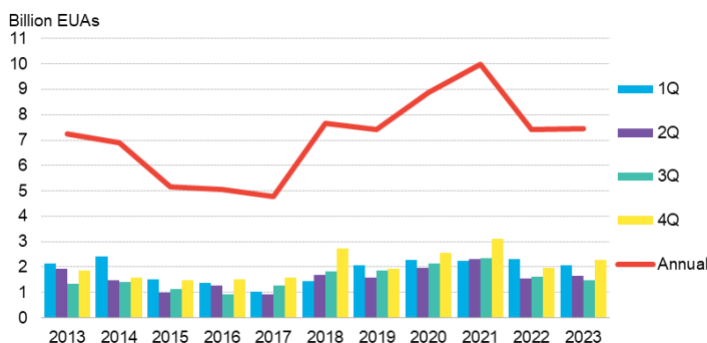
⁶⁴ CAN is a processed standard blend of fertilizer primarily derived from ammonia and nitric acid, both of which have benchmarks under the EU ETS. We use this nitrogen fertilizer as a representative indicator of potential impacts.

6.1.1. Volume

Traded volume is crucial when assessing liquidity. A liquid market allows market participants to open and close positions – in other words, enter and exit the market – whenever they want. Liquidity also enables participants to engage in activity without unduly affecting the market and allows them to be confident that the future is priced at its true value.

Traded volumes remained largely similar in 2023, at 7.5 billion EUAs, increasing just 1% compared with 2022. They remained subdued compared to 2021, when volumes neared 10 billion EUAs, but were in line with 2019, before both the pandemic and energy crisis began. Activity appeared to pick up in the fourth quarter of 2023, with volumes increasing 16% compared to one year earlier, pointing to a possible recovery in EUA demand.

KPI 6.1: Traded EUA volumes

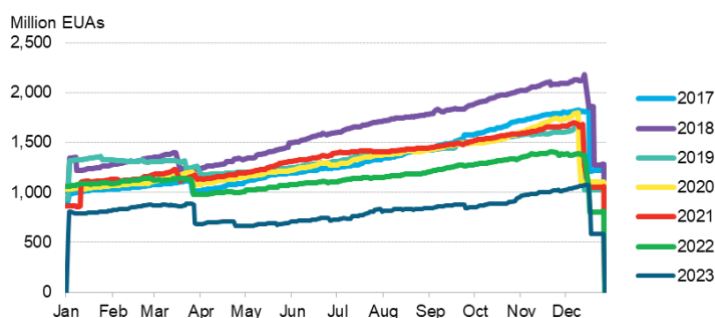


Source: ICE, BloombergNEF

6.1.2. Open interest

Open interest denotes the total number of outstanding contracts that are held by market participants at the end of each day – in other words, it measures contracts bought or sold without completion of the transaction by subsequent sale or purchase, or by making or taking actual delivery of the financial instrument or physical commodity. Open interest measures activity levels in the futures market. Generally, the higher the open interest, the more a contract is traded and hence the higher the level of liquidity.

KPI 6.2: Aggregate open interest seasonality



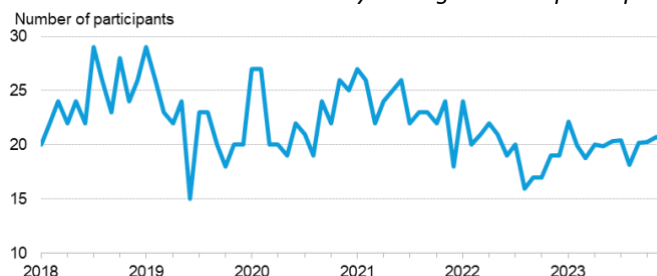
Source: ICE, BloombergNEF

Open interest was the lowest in more than a decade in 2023, dropping 29% from 2022. Lower open interest could point to two different dynamics playing out. First, utilities, the biggest group that actively manages its carbon exposure, have reduced their hedges. Second, investors, who drove the carbon rally in 2018, saw the investment case for holding allowances changing.

6.1.1. Auction participation

Auction participation counts the number of participants in daily auctions on the European Energy Exchange (EEX). By measuring how many participants are bidding into auction, this KPI reflects interest in primary supply. Participation increased marginally in 2023, with an average of 20.1 participants per auction, up from an average of 19.6 in 2022. Both years sat below the

KPI 6.3: Monthly average auction participation



Source: EEX, BloombergNEF

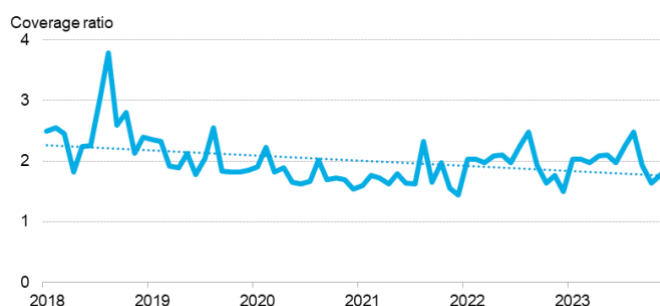
average of 23.1 participants seen between 2021-2018. Low power sector emissions amid high renewables generation lowered the need of many utilities to accumulate further supply of EUAs, which could have been a contributing factor.

6.1.2. Auction coverage

The auction coverage ratio reflects the total number of bids in an auction divided by the number of available EUAs. This indicator reveals what actual auction demand is relative to supply on the primary market.

The coverage ratio continued to recover in 2023, averaging 2.01 across the year and remaining largely in line with 2022. A coverage ratio above 2 is reassuring; a ratio below 2 – which occurred in 2020 and 2021 – can allow some market participants to exercise market power or potentially game auctions in the future.

KPI 6.4: EU ETS auction coverage ratio



Source: BloombergNEF

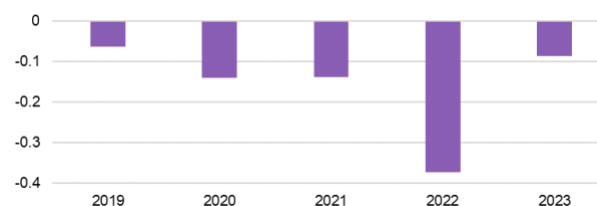
6.1.3. Auction-spot differential

The auction-spot differential KPI measures the difference in the EUA price between auctions and the secondary market. A low absolute difference is preferable, as a high difference could indicate an ability of market participants, particularly speculators, to exercise market power.

The auction-spot differential has reverted to an average of -0.09 in 2023, down from -0.4 in 2022.

The smaller differential could be an expression of lower risk as it indicates a smaller difference between the price the bidder is willing to pay, and the price sellers expect to receive. The low auction-spot differential combined with a high average EUA price in 2023 suggests that the market is stable and that expectations between bidders and sellers are closely aligned.

KPI 6.5: Annual average difference between auction and spot price



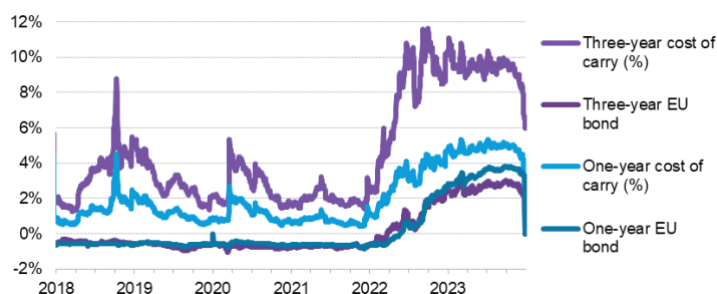
Source: EEX, BloombergNEF

6.1.4. Cost of carry

Cost of carry can be used as an indicator of how market players expect the price to move in the future. It shows the difference between the price on the spot market and a futures contract with delivery in the future, therefore telling us the premium the market places on futures contracts.

After the cost of carry more than tripled in 2022, it remained elevated in 2023, dropping only marginally. This suggests market players are continuing to place a much larger premium on future price developments.

KPI 6.6: Cost of carry of EUAs versus AAA EU 3-year bond yields



Source: ICE, BloombergNEF

Note: Cost of carry here shows the difference between the one and three-years ahead December futures contracts and the front-year December futures contract.

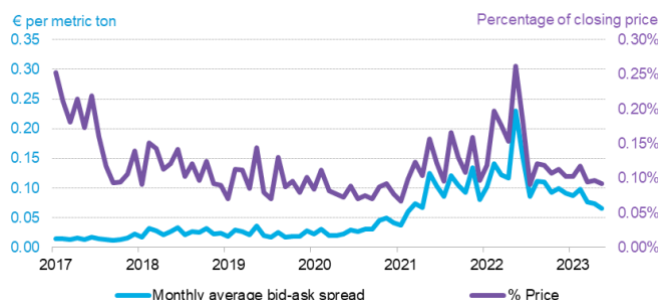
A higher cost of carry can reflect higher price expectations for the future, or that spot contracts are valued cheaply in comparison. Inflation and rising interest rates have raised the cost of capital, making contracts dated further into the future relatively more expensive.

6.1.5. Ask-bid spread

This KPI shows the difference between the lowest ask price and the highest bid price at market close. The average ask-bid dropped to EUR 0.10 per ton in 2023, compared to EUR 0.12 per ton in 2022.

A reduced ask-bid spread can signal greater certainty in the market and can be an expression of lower risk. It indicates a shrinking difference between the price the bidder is willing to pay and the price sellers expect to receive. However, while the difference in 2023 decreased, it was still three times that seen in 2019 and double the value in 2021, and can, in part, be linked to much higher allowance prices.

KPI 6.7: Ask-bid spread on ICE



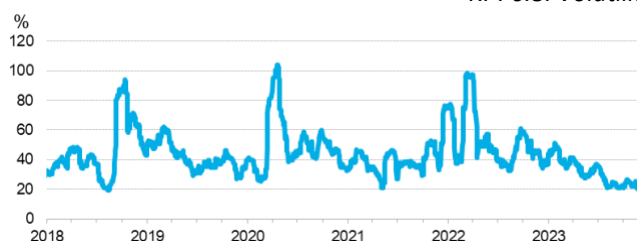
Source: ICE, BloombergNEF

6.1.6. Volatility

In addition to the ask-bid spread, volatility is another measure of risk in the market. This metric represents how much prices move around the mean price. High volatility is undesirable for compliance entities, as utilities and industrials need a reliable price signal on which to base long-term investment decisions. On the other hand, high volatility may be positive for traders and other financial participants seeking to profit from price movements.

Volatility tumbled in 2023, averaging 32%, down from a record-high 53% in 2022 and below the values of the past five years. On the demand side, reduced power sector emissions and slow industrial activity was met with the final confirmation of reforms and additional supply from the REPowerEU package on the supply side, taking the pressure off the market and reducing the event-driven fluctuations in EUA prices that had become commonplace in 2022.

KPI 6.8: Volatility



Source: BloombergNEF

Note: Volatility refers to the 30-day price volatility. It equals the annualised standard deviation of the relative price change for the 30 most recent trading days' closing price, expressed as a percentage.

6.1.7. Article 29, EU ETS Directive

Final decisions on the cost containment mechanism known as Article 29a were confirmed in 2023. The mechanism was amended to the following: 'if the average allowance price of the six preceding calendar months is more than 2.4 times the average allowance price of the preceding two years reference period, 75 million allowances shall be released from the Market Stability Reserve.' After being a particularly hot topic due to the rapid price increase in EUAs, discussion largely

KPI 6.9: Cost containment mechanism (Article 29a)



Source: BloombergNEF, European Commission

died down in 2023, with the trigger price sitting well above the EUA price for the majority of 2023.

6.2. Supply-demand balance and evolution of TNAC

KPI 6.10 depicts how the balancing of the market has operated so far, including the main supply sources: free allocations and auctions.

The main mechanisms at play for market balancing have been the ad hoc measure of reducing auction volumes through backloading and a rule-based mechanism, the Market Stability Reserve (MSR). The key indicator underpinning the MSR is the total number of allowances in circulation (TNAC).⁶⁵

The most recent TNAC value, published in May 2023, amounted to 1.13 GtCO₂. This TNAC value is expected to trigger a total auction volumes reduction of 272 million allowances between September 2023 and August 2024. The total number of allowances that became invalid on 1 January 2023 was 2,515 million. The remaining holdings in the reserve amount to 486 million allowances.⁶⁶

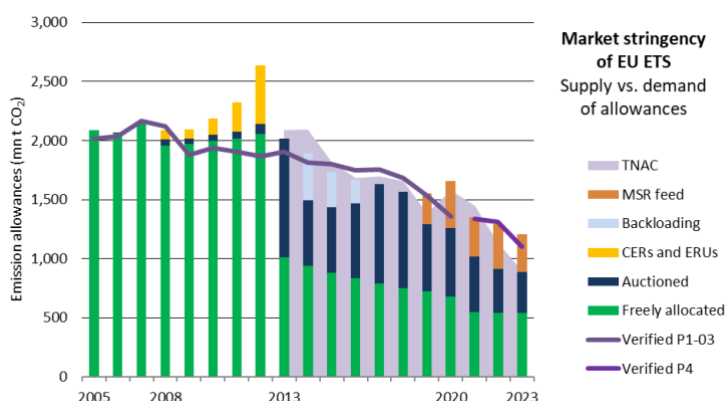
6.3. Price forecasts

If the aim of this Report is to keep track of changes that have an impact on the EU ETS, it is interesting to follow how the perception of the market changes over time. To do that, we can evaluate price forecasts from different analysts.

KPI 6.11 shows EUA price forecasts collected from various analysts. Near-term estimates are more subdued and suggest the price may remain flat, or even decline in 2025. On the supply-side this is being driven by the additional allowances being added to the market because of REPowerEU and the phase-in of maritime transport. Meanwhile, low power sector emissions and subdued industrial output has lowered near-term demand-side expectations.

However, there is a strong consensus that the carbon price will continue to trend upwards until the end of the decade. While the forecasts may vary from year to year and methodologies may change, they give an overall impression of market sentiment. The upward trend illustrates the anticipation of future scarcity in Phase 4, which runs from 2021-2030.

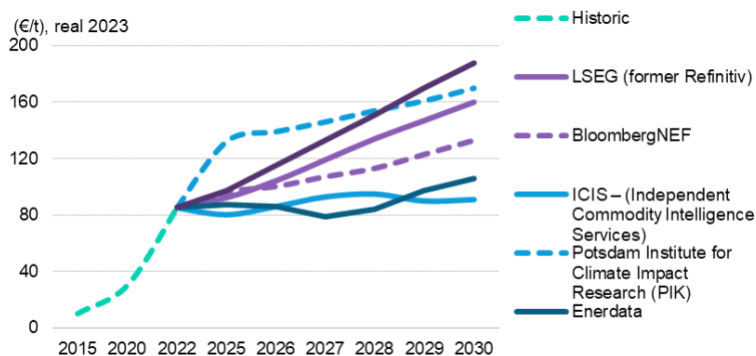
KPI 6.10: Supply and demand of EUAs and TNAC



Source: Wegener Center, based on EUTL (2024), EEA (2024), European Commission (2023)

*CERs 'Certified Emission Reduction', ERUs 'Emission Reduction Units'

Figure 6.11: EUA price forecasts



Source: BloombergNEF, LSEG, Enerdata, ICIS, PIK

Note: Prices are in real 2023 EUR/per metric ton.

⁶⁵ TNAC = supply - (demand + allowances in the MSR)

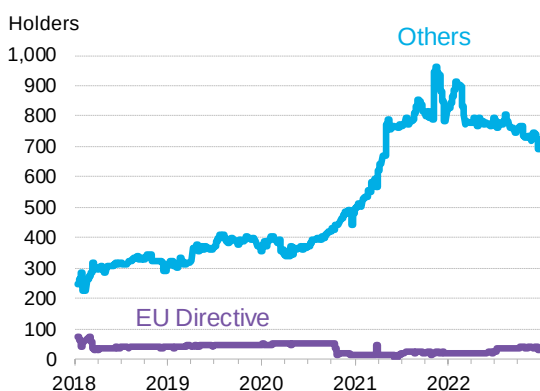
⁶⁶ Communication from the Commission Publication of the total number of allowances in circulation in 2022 for the purposes of the Market Stability Reserve under the EU Emissions Trading System established by Directive 2003/87/EC (2023/C 172/01). Official Journal C 172.

6.4. Market participation

The average number of entities invested in EUA futures and not regulated under the EU ETS Directive increased in 2023 compared to 2022, to 789. This represents more than double the average amount of participants in the market in 2019 and has been rising year-on-year. Speculators can increase volatility and create price spikes if they trade opportunistically. They can also bring market liquidity and stability to prices if they have a longer investment horizon (beyond one year) and invest from a market fundamentals perspective.

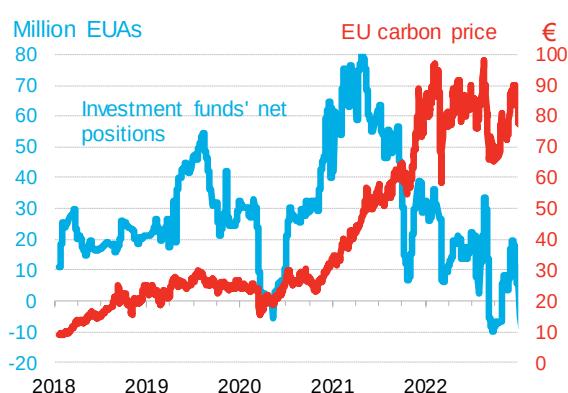
EUA price movements across 2018-2023 generally aligned with changes in the positions of investment funds. This suggests that speculators can move the market, especially when the market trades on thin volumes.

KPI 6.12: Net position holders



Source: BloombergNEF

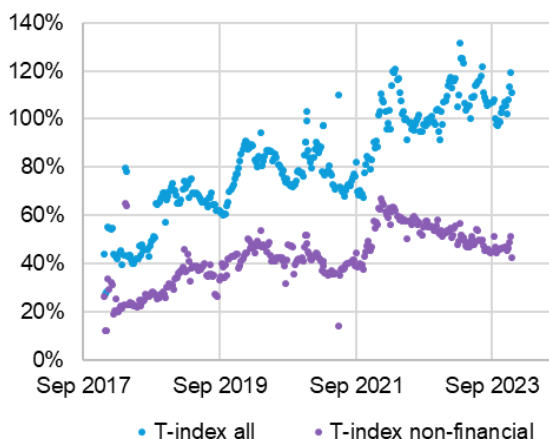
KPI 6.13: Investment funds' net positions



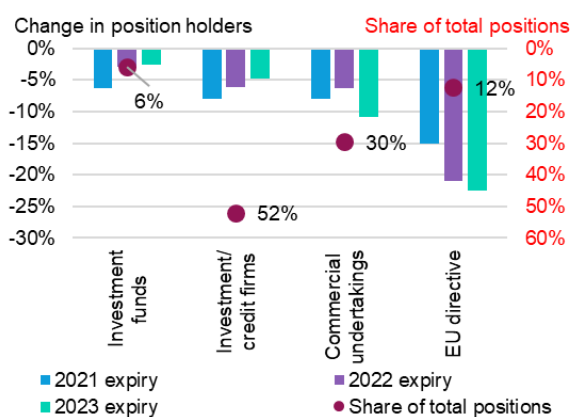
Source: BloombergNEF

The carbon price (KPI 6.13) finished 2023 at a similar level to the start of the year, despite hitting a record high of over 100 EUR/t in February. The price largely trended downward in the remainder of 2023 after the peak, with a final price rally seen at the very end of the year.

KPI 6.14: Positions taken in excess of hedging need for all market actors and for non-financial actors only



KPI 6.15: Change in number of position holders by role



Source: BloombergNEF

Note: Data is from Commitment of Traders (CoT) database.

The role of financial investors in the EU’s carbon market was a hotly debated topic in 2022, with some lawmakers seeking to restrict their access to curb speculative trading activity. While that proposal is now firmly off the cards and was dropped from the rhetoric in 2023, the influence of financials could be increasing as demand for emission allowances from other players appears to be falling.

Positions held outside of the need for hedging future compliance obligations (KPI 6.14) has been increasing every year, hitting an average of 110% in 2023, up from 102% in 2022, and almost double the 68% seen in 2019. Meanwhile, non-financial actors’ positions sat at 49% in 2023, down from 58% in 2022, but largely in line with the five-year average of 46%. Investment and credit firms held the majority of positions at 52% (KPI 6.15) despite reducing positions from 2021 to 2023. The largest reduction was from those covered by the EU ETS Directive, declining 23% between 2022 and 2023 and dropping to just 12% of the positions held.

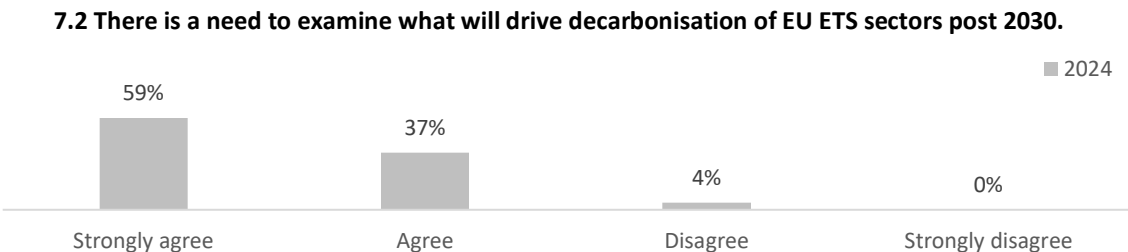
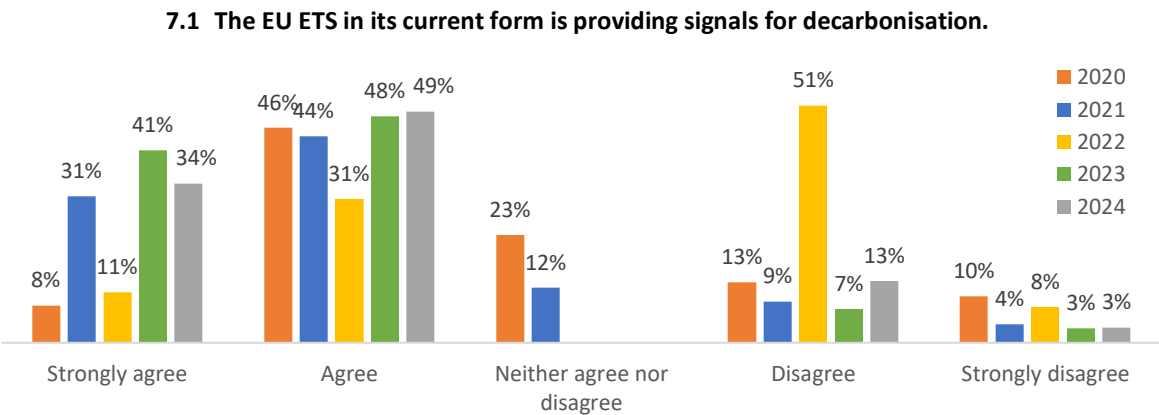
This dynamic in 2023 is likely to have been exaggerated by the significant decline in power sector emissions, reducing the need for future hedging by those covered by the Directive. The loss of free allowances for both aviation operators and industrials, as well as the inclusion of maritime transport in the EU ETS in 2024, could start to see increased hedging from compliance entities.

7. Market Sentiment Survey

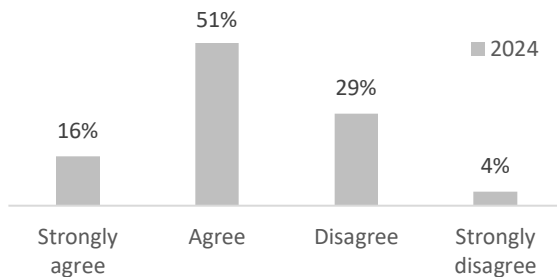
Market sentiment towards the EU ETS has historically been pivotal, often regarded as equally if not more influential than market fundamentals in determining the scheme's behaviour. Even as the importance of fundamentals in price determination has grown, the sway of sentiment, particularly when spurred by regulatory developments, continues to hold significant weight. This influence is further underscored by the prevailing view that the regulatory framework is vulnerable to fluctuations in political sentiment.

For the seventh year running, the ERCST has carried out a Market Sentiment Survey among EU ETS stakeholders identified as 'market players and opinion makers'. This group includes experts in carbon pricing, policymakers, industrial and utility operators, traders, and civil society representatives. It is important to underscore that respondents are anonymous and that the final sample may disregard statistical representativeness.

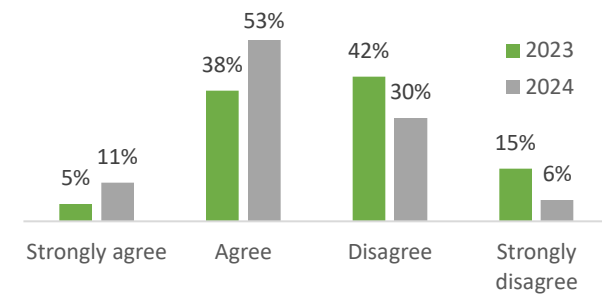
Figures 7: Market Sentiment Survey results



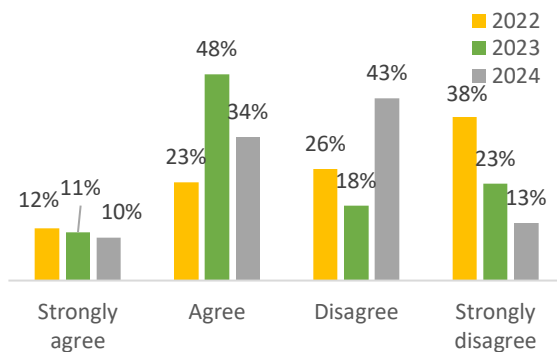
7.3 Is the EU ETS, in its current shape, a good instrument to incentivise the deployment and implementation of low carbon technologies in covered sectors, contribute to EU decarbonisation goals post 2030, and spur homing economic activity in the EU?



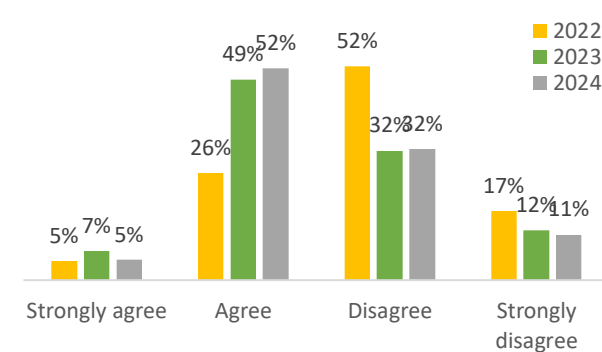
7.4 The electricity market design and the EU ETS work in synergy to reach EU Climate Law objectives.



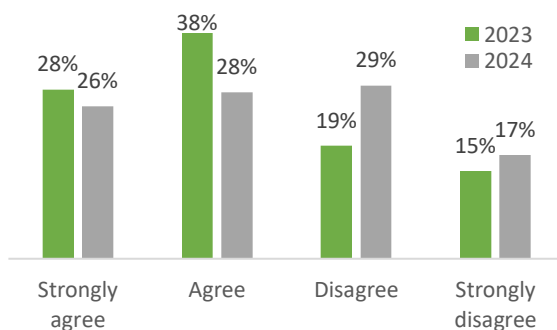
7.5. The combination of EU ETS and current CBAM for the EU will adequately address competitiveness and carbon leakage concerns for the EU industry.



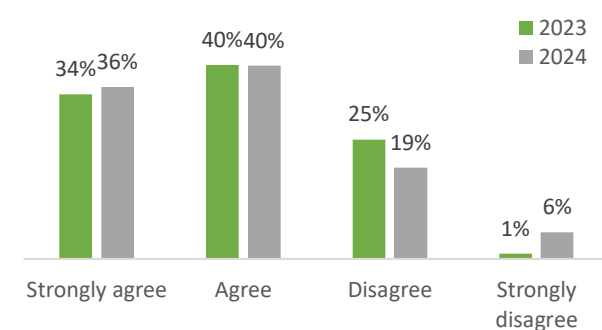
7.6. The EU ETS post Fit for 55 review address the main concerns raised by stakeholders, especially related to competition.



7.7 To reach the goals of the Climate Law, an international link through international credits, including removals, is important.



7.8 Early integration of removals in EU regulation, including in the EU ETS, is critical to reach EU climate objectives.



The results from 2024 present a diverse range of perspectives, with certain measures and outcomes being viewed positively, whereas others are met with more scepticism.

In line with last year's results, the vast majority of the sample (Figure 7.1) agrees that the EU ETS in its current form is providing signals for decarbonisation (83% agree or strongly agree).

Two new questions have been added in this year. The first one gauges the need to examine what will drive decarbonisation of EU ETS sectors post 2030 (Figure 7.2). Respondents seem to be in strong agreement with the need to examine the EU ETS post 2030 (96% agree or strongly agree). This underscores the importance of addressing the scheme's future in time to avoid perturbing market confidence.

The second one questions whether the EU ETS is a good instrument to incentivise the manufacturing and deployment of low carbon technologies in EU ETS covered sectors while bolstering domestic economic growth (Figure 7.3). A slight majority of stakeholders, 67%, are of the view that the EU ETS is effectively catering to these goals.

Compared to the previous year, there is a discernible shift in the perception of how well the EU ETS and the electricity market design are synergistically supporting the European Climate Law's objectives, as indicated in Figure 7.4. The proportion of respondents who strongly agree with this synergy has indeed increased from 42% in 2023 to 64% this year, while those in general disagreement have decreased from 57% in 2023 to 36% this year. These results may be explained by the agreement reached by the Council and Parliament to revise the Electricity Market Regulation by the end of 2023, reducing the incertitude on this file.

The revision of the EU ETS has been marked by the creation of a CBAM to address carbon leakage. The results in Figure 7.5 for 2024 show an erosion of enthusiasm on the effectiveness of the CBAM and the EU ETS in addressing carbon leakage concerns compared to 2023. In 2024, 56% of survey participants view these measures negatively, compared to 41% in 2023.

The perception of how well the EU ETS revision process addressed stakeholders' concerns has markedly improved over the past two years, as shown in Figure 7.6.⁶⁷ In 2022, only 30.2% of respondents believed that the key issues identified during the revision were adequately considered. However, this percentage significantly rose to about 56% in 2023 and further to 57% in 2024. This trend indicates a growth in stakeholders' satisfaction with the outcomes of the revision process.

Questions 7 (Figure 7.7) and 8 (Figure 7.8) reflect respectively on the international aspects of the EU ETS, and the early integration of carbon removals in the scheme. Stakeholders' opinions on the necessity of including international credits, such as carbon removals, to achieve the objectives of the European Climate Law are evenly split across the spectrum of judgment, mirroring the sentiment observed in 2023. In 2024, 54% of respondents support international credits to achieve the goals of the European Climate Law versus 66% in 2023. The results of Question 8 indicate a persistent enthusiasm for the possibility of integrating carbon removals at the domestic level, with over 76% of respondents showing support for this approach.

Overall, stakeholders seem to agree that the EU ETS is providing signals for decarbonisation to 2030, without losing sight of what will drive decarbonisation of EU ETS sectors beyond this timeframe. Opinions on the present form of the CBAM are divided, particularly concerning its ability to mitigate competitiveness and carbon leakage issues. Nonetheless, there is substantial support for the prompt integration of carbon removals in the EU ETS. This may provide a signal to the EU institutions to promote discussing the issue on the future of the EU ETS and the integration of carbon removals.

⁶⁷ The concerns raised by stakeholders during the EU ETS revision included impact on low-income households, distributional concerns between Member States, carbon leakage risk, industrial competitiveness, use of revenues, energy efficiency, delayed decarbonisation of the industrial sector, deployment of innovative climate-neutral technologies, coverage, emissions reduction, regulatory uncertainty, transparency, price volatility, etc.