Wednesday May 21st, 2025

2025 State of the EU ETS Report

Public Launch Event

University Foundation, Rue d'Egmont 11, Brussels

BloombergNEF COMPASS LEXECON Wegener Center UNI GRAZ ERCST Roundtable on Climate Change and Sustainable Transition

2025 Table of Content (ToC)

1. Background

State of the EU ETS Report is meant to be a "**snapshot**"

- Provides policymakers and stakeholders with an overview of how the EU ETS is doing by each year, based on previous year data. 2025 State of the EU ETS Report is based on 2024 data.
- **2024 Context:**
  - Industrial transformation, competitiveness, carbon pricing and decarbonisation
  - EU ETS Implementation
  - Future of the EU ETS
  - New EU mandate 2024-2029
  - Change in international context (i.e. USA outside of the Paris Agreement)

2. An EU ETS "fit for purpose"

What do we expect the EU ETS to deliver?

3 key deliveries:

1. **Environmental delivery.** Does the EU ETS deliver against **absolute environmental targets**? (Chapter 4)
2. **Competitiveness and socio-economic delivery.** (Chapter 5)
   - Does compliance with the EU ETS deliver **macroeconomic efficiency** and **cost-effectiveness**?
   - Is it a **driver for change** without destroying EU industrial competitiveness?
   - Is the ETS allowed to provide a **price signal** for decarbonisation?
3. **Market functioning.** Is it worth having a market only if it functions well and leads to good **price discovery**?

3. Regulatory Developments

Monitoring and Reporting Regulation (**MRR**) -C/2024/6542 final	• **Permanent chemically bound** products not surrendering certificates (Art 49a). • Inclusion of upstream emissions from fuels (**road transport and buildings**), and **non-CO_2 aviation** (Art 3 (69)). • Inclusion of RFNBO, RCF and synthetic **low-carbon fuels definitions** and treatment **from RED ii**.

Free Allocation Regulation (**FAR**) - C/2024/441 final	• NACE/PRODCOM/Combined Nomenclature (**CN) classification** (Art 10 (2a)).
	• **Conditionality** on free allocation – link to **climate plans** (Art 22b), and **energy efficiency measures** (Art 22a).
	• New **reference value** (from 0.97 to 0.91) for the calculation of free allocation for **process emissions** (Art 16(2).
	• Change in the **benchmark definition of hydrogen** to incentivise decarbonised process (Annex I).
	  • *Competitiveness impact:* Lower amount of free allocation for carbon leakage sectors, will increase the compliance cost of carbon
	  • *Market impact:* The less free allocation available, the higher the demand of EUAs.

Activity Level Changes (**ALC)** – to be adopted	• **Delete** requirement for **preliminary activity level report** (following change of free allocation from Feb to Jun). • **Minimum threshold to trigger activity level change** adjustments increased from 100 **to 300 EUAs**. (Art 6a)
Accreditation and Verification Regulation (**AVR**) - (EU) 2024/1321	• New verification rules for **municipal waste installations** above 20MW rated thermal input and ETS2 sectors. • Harmonised rules for verifiers to confirm implementation of **energy efficiency measures** (Article 17a). • Rules for verifiers to check **sustainability and GHGs saving criteria** for biomass fuels (Art 17).

3. Regulatory Developments

Union Registry – to be adopted	• New rules on transfer of **aviation allowances to EU Auction Account** (Art 40) • New rules for regulated entities covered by **ETS2** (Art 15b(7)). • **Clawing back EUAs/EUR** that are unduly or mistakenly delivered to operators (Art 58a). • *Competitiveness impact:* If carbon price increases, resituated EUAs will not equal the surrendered EUAs in the relevant period.
Permanently chemically bound GHGs - 2024/2620	• Captured CO2 utilised in the manufacture of **mineral carbonates and used in construction** (i.e. cement, lime, hydraulic blinders, bricks) should be considered permanently chemically bound in a product (Annex I). • No obligation to surrender allowances for those GHGs (Art 3b EU ETS Directive) • *Market impact:* An expansion of the list of products may lead to a decrease in demand for EUAs. Unlikely to significantly impact the market as long as no substantial amounts are available. If the list of products is reduced, there will be an increased demand for EUAs.
Maritime	• List of **Administering Authorities** ((EU) 2024/411), list of **derogated islands and ports** – Finland ((EU) 2024/1113), **monitoring of GHGs** from offshore ships and zero-rating of sustainable fuels ((EU) 2024/3214) • *Market/Environmental impact*: As the maritime sector receives no free allocation, the inclusion of additional ships should increase demand of EUAs and reduce GHGs.

3. Regulatory developments

3.1.2. Other EU Policies impacting carbon

- In addition to EU ETS, policies impacting carbon include:

Climate Law
Carbon Border Adjustment Mechanism (CBAM)
Renewable Energy Directive (RED)
Energy Efficiency Directive (EED)
RePower EU

Industrial Emission Directive (IED)
Social Climate Fund (SCF)
Industrial Carbon Management Strategy (ICMS)
Energy Market Regulation (EMR)

Carbon Capture and Storage (CCS) Directive
Net-Zero Industry Act
ReFuelEU Aviation
FuelEU Maritime
Energy Governance Regulation

Source: 2024 State of the EU ETS Report

- New EU policies/anouncements in 2024 with an impact on carbon:
  - **EU Energy Governance** Regulation (EU) 2018/1999 (Art 19 (2) ask MSs to report on EU ETS revenues use. **Templates** were **updated in May 2024** to collect more detailed information on revenue use [1].
  - Carbon Removal Certification Framework Regulation (**CRCF**) (EU) 2024/3012. Regulation sets the rules for quantifying, monitoring, and reporting CDR in the EU. Its **review should take into account EU ETS** legislative developments (Art 18). Adopted in November 2024, the certification of CDRs can be a **first step for their potential inclusion in EU ETS** after 2026.
- The increasing complexity of the EU ETS is a symptom of the growing number of EU regulations in the climate, energy and industrial-related fields. The premise of the EU ETS as a market-driven tool is losing credibility.
  - While it is well understood that other policies will be needed, and will be introduced, the amount of interference with carbon pricing has reached new levels and is affecting the efficiency that markets are supposed to bring.

Source: [1] DG CLIMA (2024) Adopted: New templates for Member States' climate reporting. 7 May.

3. Regulatory Developments

3.1.2. Other MS Policies Impacting Carbon: **Green Subsidies**

- In 2024, national state aid was characterised by the deployment of **low-carbon policies.** Measures such as the *Temporary Crisis and Transition Framework (TCTF)* provided the legal basis for these instruments to be compatible with the EU single market. To illustrate, in **2024** the Commission approved up to **€ 18.862 billion** of green subsidies to **Germany** alone.
  - **Key examples** of green subsidies in different MS include:

- **German "climate contracts**" (2024) [1]:
  - Subsidy scheme to transform paper, steel, chemicals and cement production by compensating the price difference compared to conventional fossil fuel-based procedures.
  - **4 billion euros** through the country's Climate and Transformation Fund through CCfDs.

- **Spanish Capacity Remuneration Mechanism** (CRM) (2025-2026)[2]:
  - To ensure security of electricity grid supply, generation, storage, and demand-side participants are remunerated (through auctions) either by injecting electricity or by reducing consumption at the request of the national power grid operator.
  - On-going CRM schemes in France, Italy, Poland, Ireland, Belgium accounting **62 B/EUR** (2017-2024)

Source: [1] BMWK (2024) First round of carbon contracts for difference launched. March 12.
[2] Miteco (2024) Propuesta de resolución de la Secretaría de Estado de Energía por la que se aprueba el procedimiento de operación de aplicación del servicio de capacidad.
[3] Aurora (2025). Capacity remuneration mechanisms in Europe. January. Slide 10.

3. Regulatory Developments

- **French Annual Grants for Industrial Decarbonisation** (2024) [1]:
  - Subsidy scheme of **€3 billion** to support decarbonised production processes of **EU ETS** companies, for a period of 15 years, through **electrification**, **CCS**, **CCU**, and **energy efficiency** measures.
  - Eligible projects must take place at existing industrial sites and reduce carbon footprints **below ETS benchmark**. They will be selected through competitive bidding, ranked by the lowest aid per tonne of CO2 avoided.

- **Italian two-way** contract for difference (‘**CfD**’) [2]:
  - **€9.7 billion** scheme to support **electricity production from renewable** energy sources to foster the transition towards a net-zero economy. The measure will support the construction of new onshore wind, solar photovoltaic, hydropower, and sewage gases electricity production installations.

- **Dutch** Stimulation of Sustainable Energy Production (**SDE++**) **scheme** (2020) [3]:
  - **€30 billion** [4] scheme supporting power generation facilities using renewable electricity, low carbon-heat, renewable gas, low-carbon production, and renewable heat. It subsidies the difference between the cost price of the renewable energy during the operational period of the project and the revenue (if any).

- The subsidies received by the power sector made possible to move away from fossil fuels. However, the growing importance of industry and renewables, could mean fossil fuels gradually becoming less important as a price-setter.

Source: [1] Commission (2024), Commission approves French State aid scheme to support decarbonisation of industrial sector.
[2] Commission (2024), Commission approves an Italian State aid scheme to support renewable electricity production to foster the transition to a net-zero economy.
[3] ERCST (2022). Reflection note on Carbon Contracts for Difference (CCfD). Pp7.
[4] European Commission (2023). State aid: Commission approves modification of Dutch scheme to reduce greenhouse gas emissions. July 10.

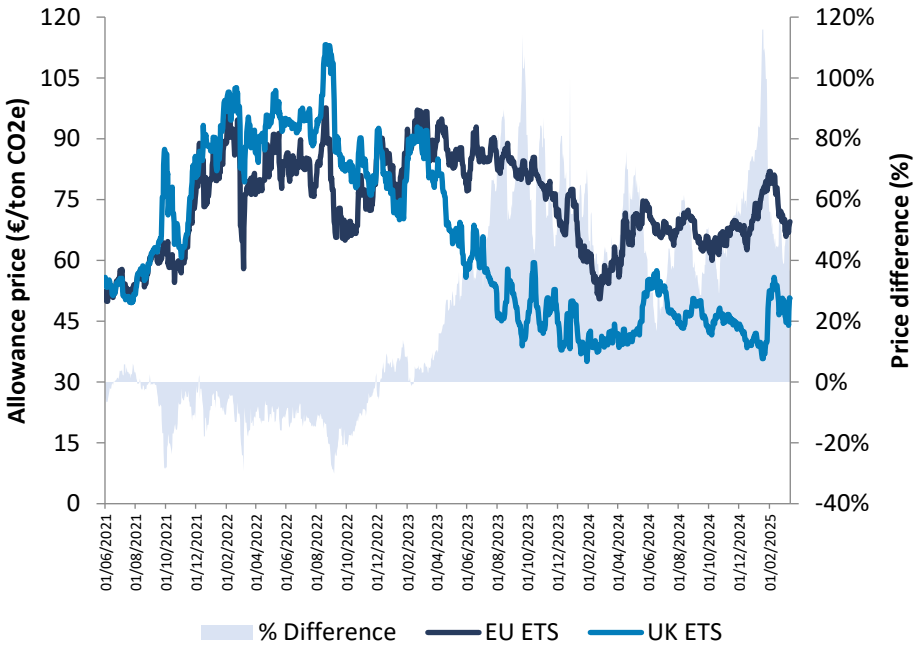
3. Regulatory developments

3.2. International carbon price developments

3.2.1. Brexit implications for the EU ETS

- ❑ UK ETS and EU ETS have continued to diverge in 2024 in terms of prices
- ❑ UK ETS 2023 reforms, policy uncertainty, reduced industrial activity and decreasing power emissions have led to UKA prices remaining lower in 2024
- ❑ The UK Government published its response in Q3 2024 to its policy design consultation held earlier in the year, outlining design details of its CBAM
- ❑ At the first EU-UK summit since Brexit, which was held on 19 May 2025, the EU and the UK agreed to work towards linking their respective ETSs

Source : UK CBAM proposal (2024); EU-UK cooperation Common Understanding (2025)



3.2.2. Linking with other emissions trading systems (Switzerland)

- ❑ Given the size of the Swiss ETS, it is not surprising to see that **trade is one-way** (from EU to Switzerland)
- ❑ **Linking is operational**, as Swiss installations have been using EU ETS allowances for 2023 compliance, up to
  - 11.6% for stationary installations;
  - 51% for aviation operators.
- ❑ **Aviation operators still use linking flexibility to much greater extent** than stationary installations, which may reflect a greater familiarity with carbon trading facilities.

Source: EC report on the functioning of the EU ETS in 2023

Note: The Swiss ETS allowances are not considered in the calculation of the TNAC (total number of allowances in circulation) of the EU ETS.

3. Regulatory Developments

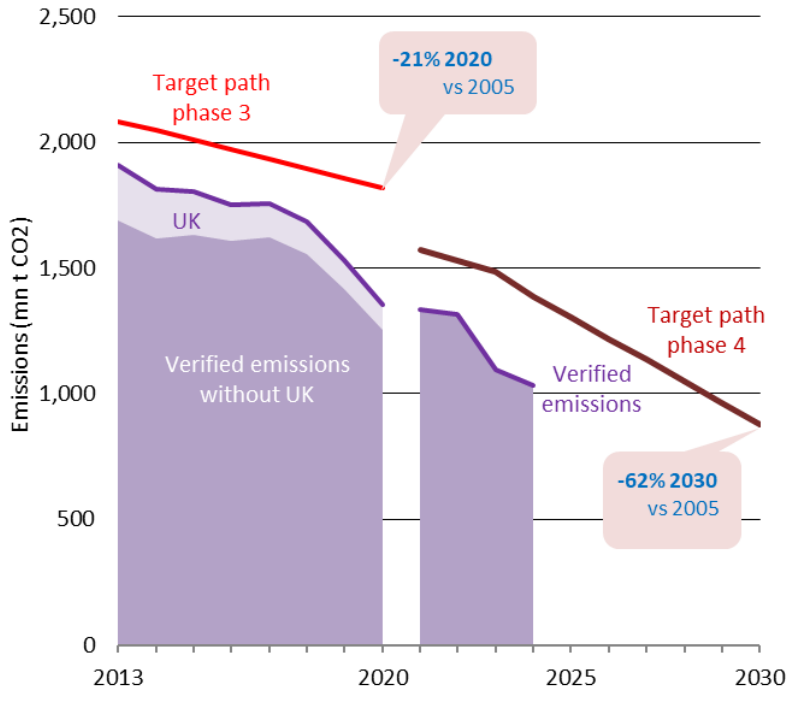
3.2.3. Article 6 of the Paris Agreement

- **An agreement on Article 6 was reached** in November 2024 at the 29th Conference of the Parties (COP29) in Baku, a significant step in establishing an international carbon market.
- The first removal credits under Art 6.4, so-called Internationally Transferred Mitigation Outcomes (**ITMOs**), are expected **to be released by mid-2025**.
- **Removal** credits under Art 6.4 were in pole position in Art 6 discussions.
- Art 6 and international removals will **need a champion**.
- Sooner rather than later the **EU may need to reconsider its position** on linking to the international credit market, especially since it negotiated hard, and got most of what it wanted from Art 6.
- This can only be done under clear volumetric and price predetermined conditions, an aspect that warrants **further exploration**.

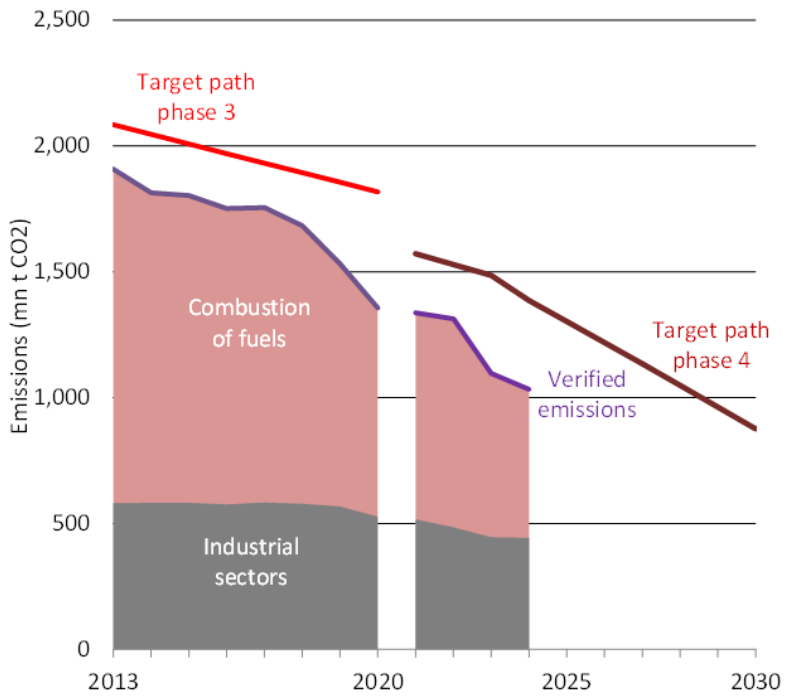
4. Environmental delivery

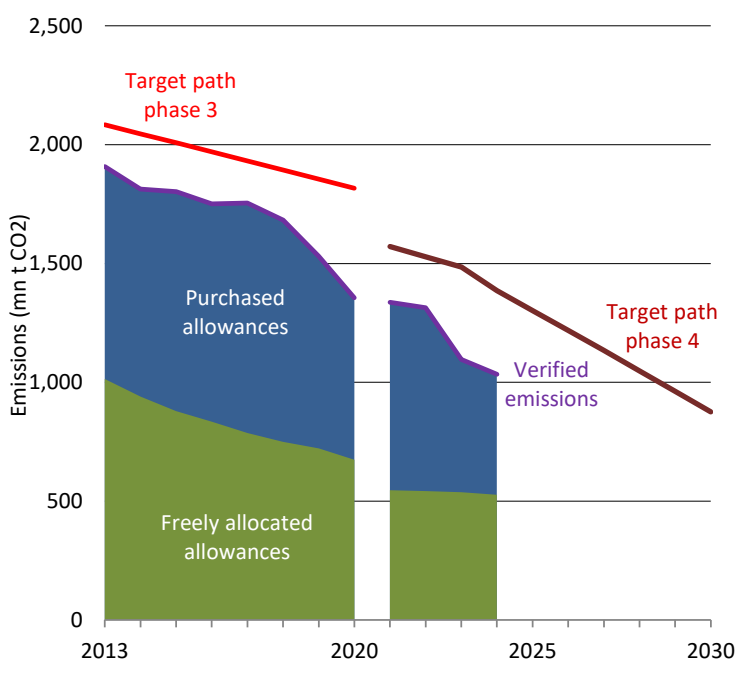
4.1. Delivery against Phase 4 target

KPI: EU ETS verified emissions vs adopted targets



KPI: Projected emissions and target paths for Phase 4





Source: Wegener Center, based on EUTL (2025), EEA (2024)

4. Environmental delivery

4.1. Delivery against Phase 4 target

4.1.1. KPIs on data for 2024

KPI: Verified emissions vs target cap

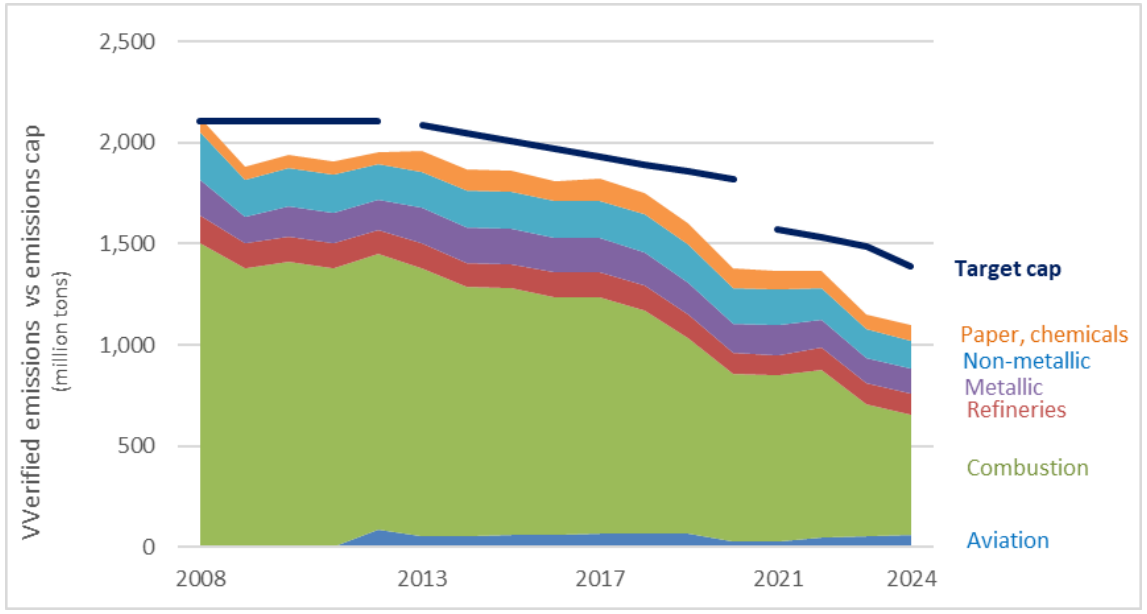
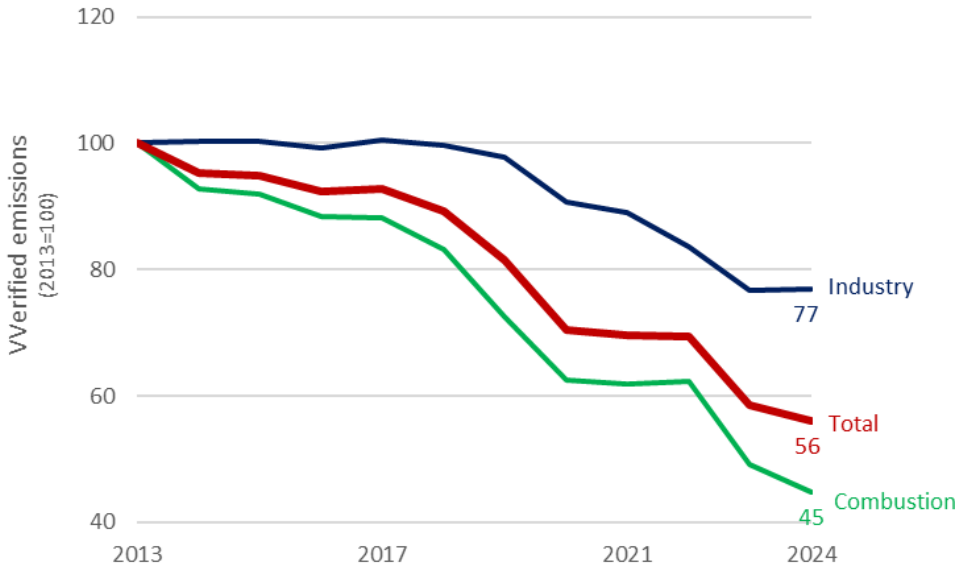


Figure: Dynamics of emissions in industry and combustion sectors

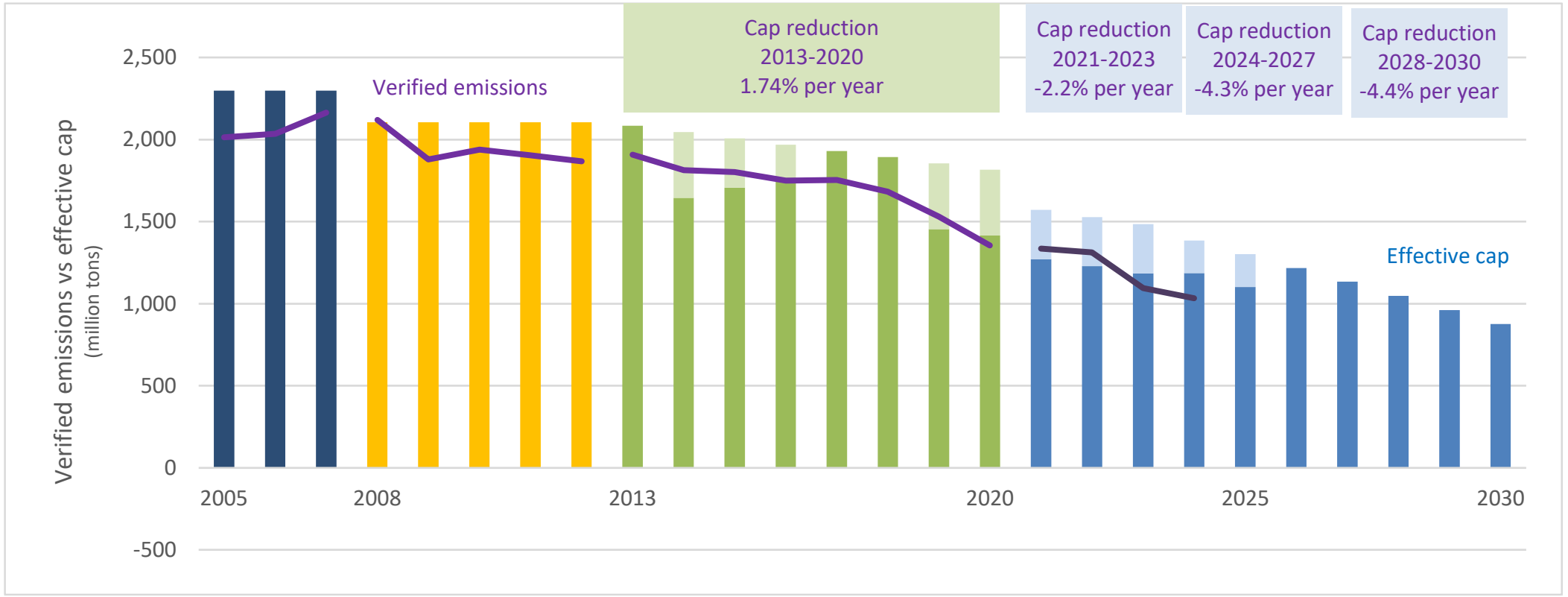


* Combustion of fuels (EUTL code 20) includes both power sector utilities and combined heat and power (CHP) in industry.

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

4. Environmental delivery

- KPI: Verified emissions vs effective cap

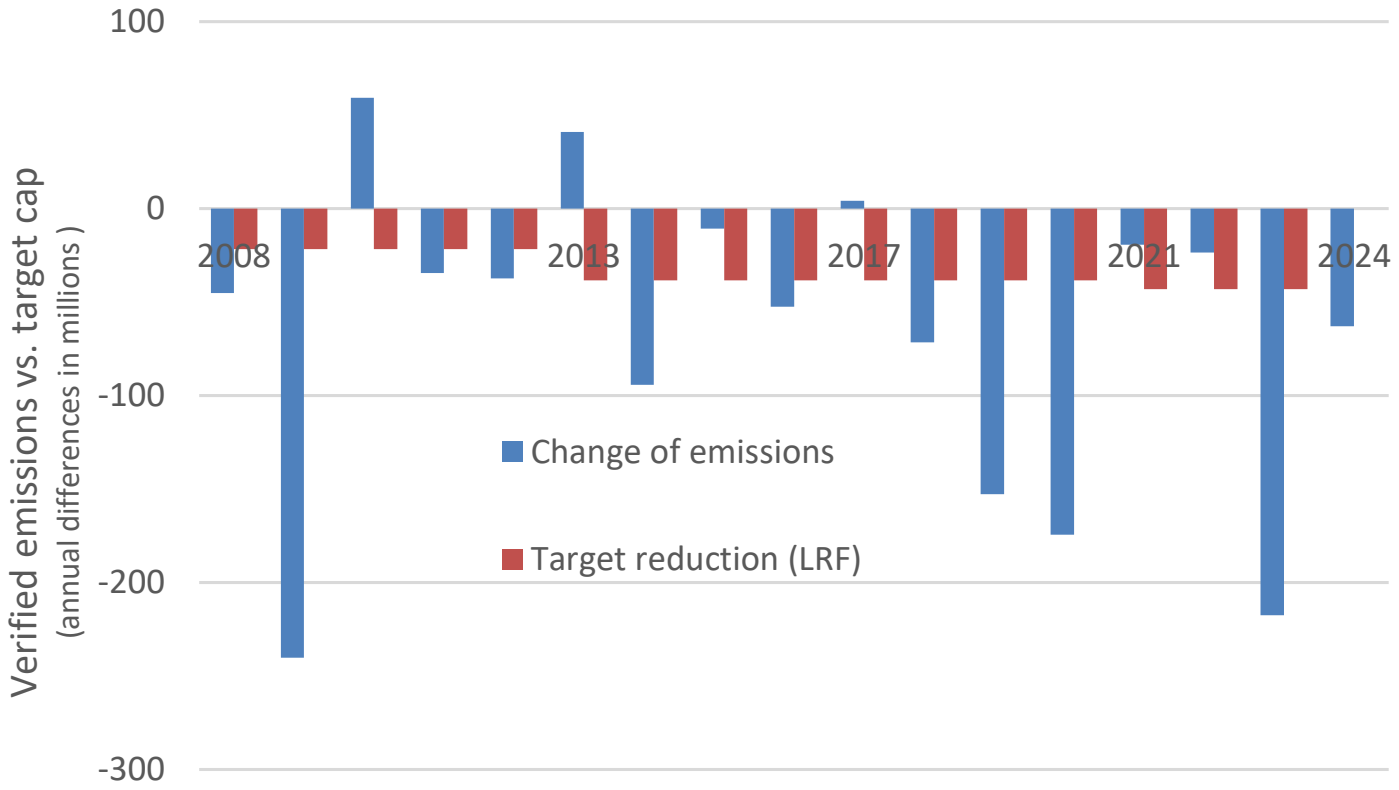


Source: Wegener Center for Climate and Global Change at the University of Graz (2025). Based on (EU ETS) absolute emission EU ETL data.

4. Environmental delivery

4.1. Delivery against Phase 4 target

KPI: Changes of verified emissions vs reduction target



Source: Wegener Center for Climate and Global Change at the University of Graz (2025). Based on EUTL emissions data.

4. Environmental delivery

Table 4.1 Power generation data and changes 2023-2024

	Generation in 2023 (TWh and %)	Generation in 2024 (TWh and %)	Change 2023-2024 (TWh)
Solar	250 9,2%	304 11,1%	54
Wind	470 17,4%	477 17,4%	7
Coal	319 11,8%	269 9,8%	-50
Gas	456 16,9%	430 15,7%	-26
Hydro	350 12,2	362 13,2%	32
Nuclear	620 23%	649 23,7%	29
Bioenergy	152 5,6%	150 5,5%	-2

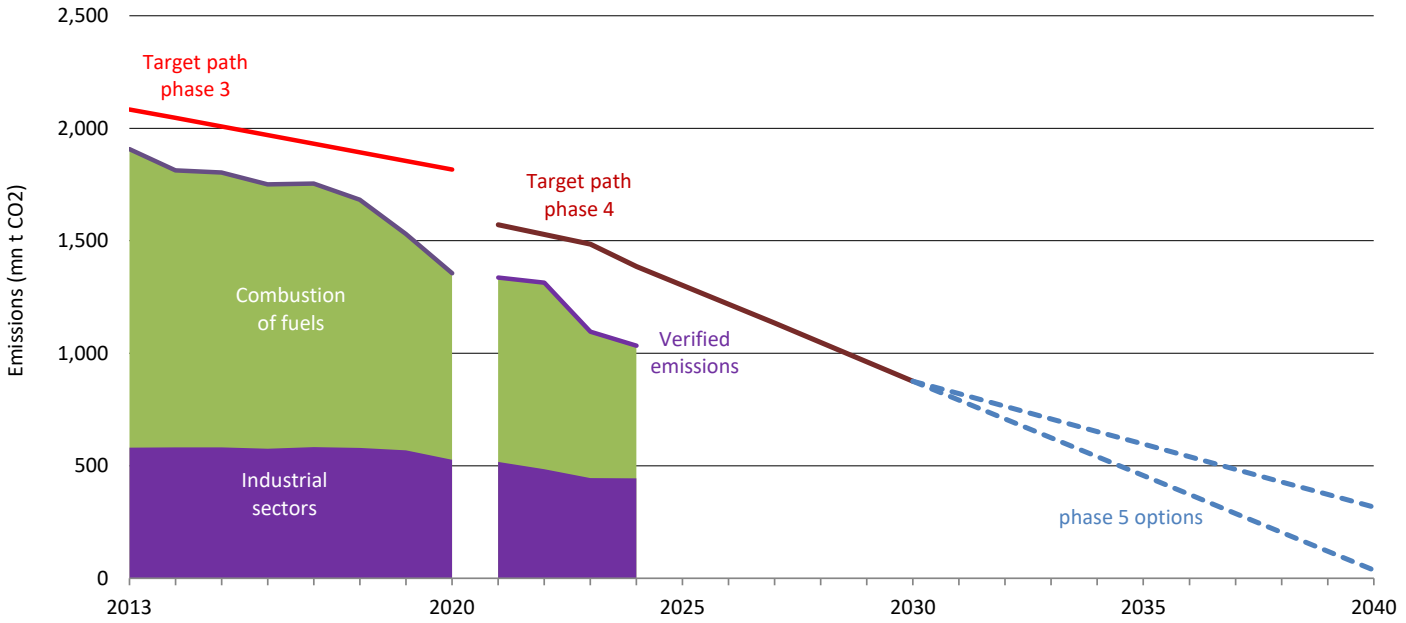
Source: Source: Ember (2023), Global Electricity Report

4. Environmental delivery

4.2. Delivery against EU long-term domestic environmental commitments

- To what extent does the 2021-2030 trading period target contribute to 2030, 2040 and 2050 goals?

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



- The EU intends to have net zero emission in 2050. It is not clear what will be the ambition level, and pace of reductions for EU ETS after 2030
- EC has recently proposed a 90% reduction target for whole EU in 2040 compared to 1990.

It will be important to discuss how to design the right transition between the present "capped EU ETS regime" with an "EU ETS net zero regime“. This should include an assessment across all ETS sectors of the remaining potential of existing technologies as well as the likelihood of technological transformation, considering the short timeframe and lack of global climate action.

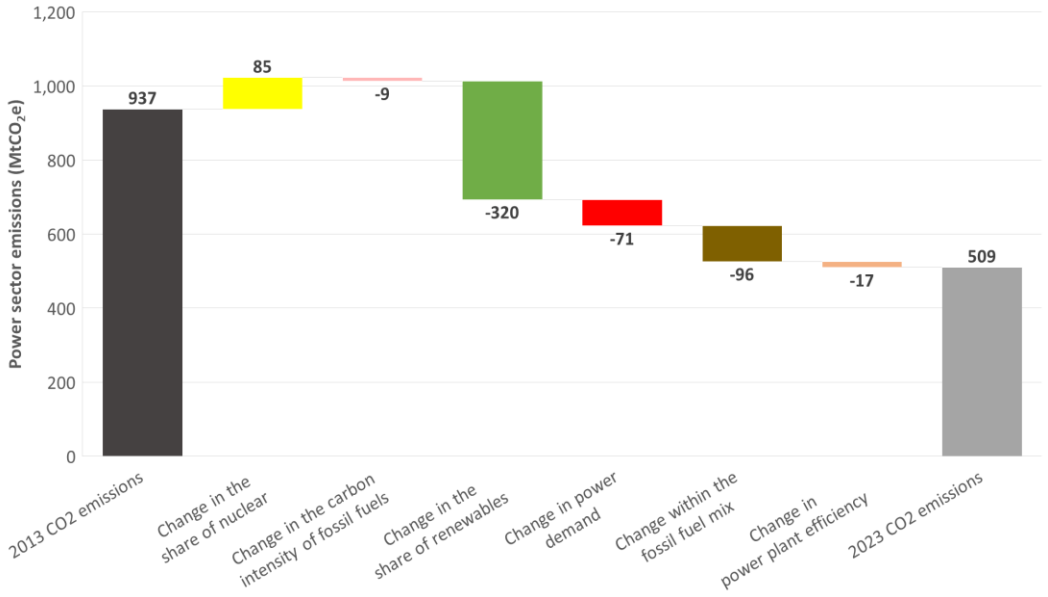
**Note: Post 2030, the target cap represents two options: the same LRF as in P4, i.e. -4.4% and a less ambitious LRF, i.e. -2.9%.*

Source: Wegener Center for Climate and Global Change at the University of Graz (2024). Based on (EU ETS) absolute emission EU ETL data.

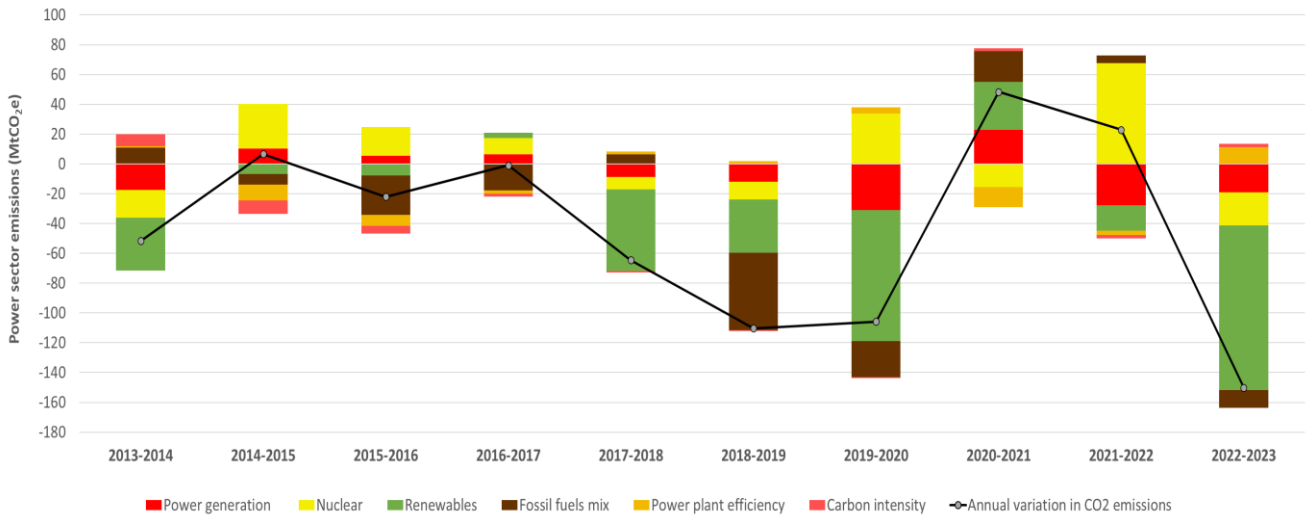
4. Environmental delivery

4.3 Evolution of Power Sector Emissions

2.1. KPI: Drivers of variation in EU power sector GHG emissions (2013-2023) (MtCO2 eq.)



2.2. KPI: Energy source vs annual drivers of variation in EU power sector GHG (2013-2023) (MtCO2 eq.)



Source: Compass Lexecon, based on I4CE-EcoAct methodology and Eurostat data
Eurostat – Electricity and heat generation – main activity producer electricity and combined heat and power
https://ec.europa.eu/eurostat/databrowser/view/nrg_bal_c__custom_10236882/default/table?lang=en
https://ec.europa.eu/eurostat/databrowser/view/nrg_bal_peh__custom_10232145/default/table?lang=en

5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

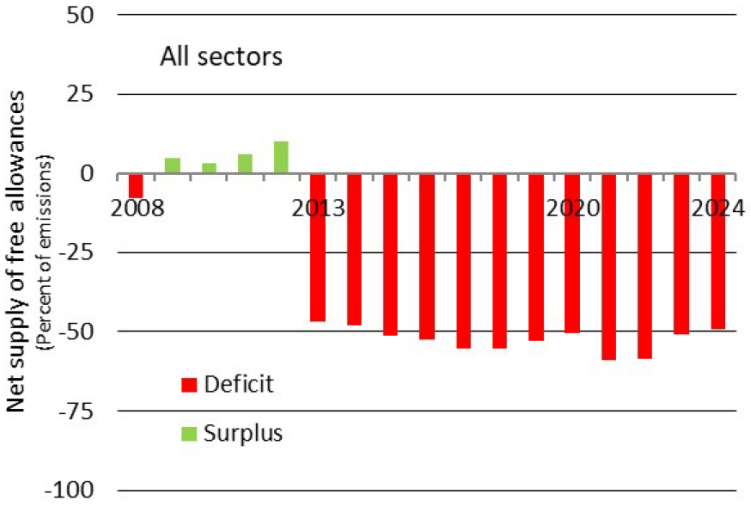
- 5.1.1. KPI: Balance of allowances
- 5.1.2. KPI: Emission intensities in selected industrial sectors
- 5.1.3. KPI: Level of carbon price of EU ETS compared to other jurisdictions
- 5.1.4. KPI: ETS compliance costs, trade & production volumes
- 5.1.5. KPI: Carbon compliance cost premium in unit production costs

5. Competitiveness and Socio-economic delivery

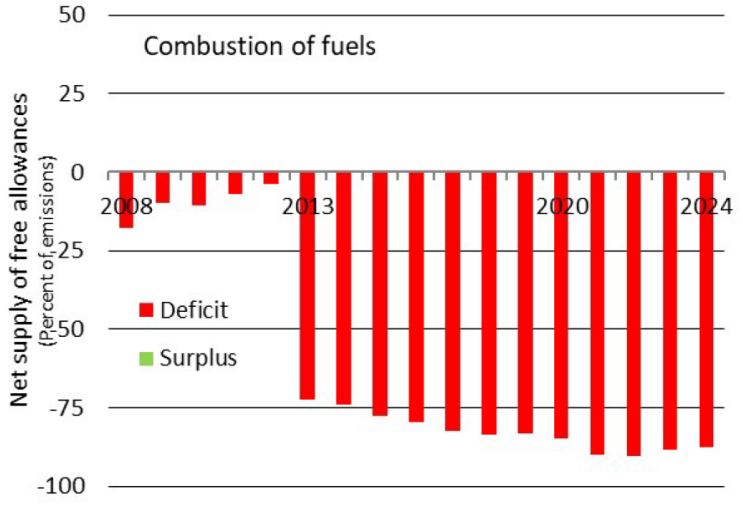
5.1. Economic Impacts

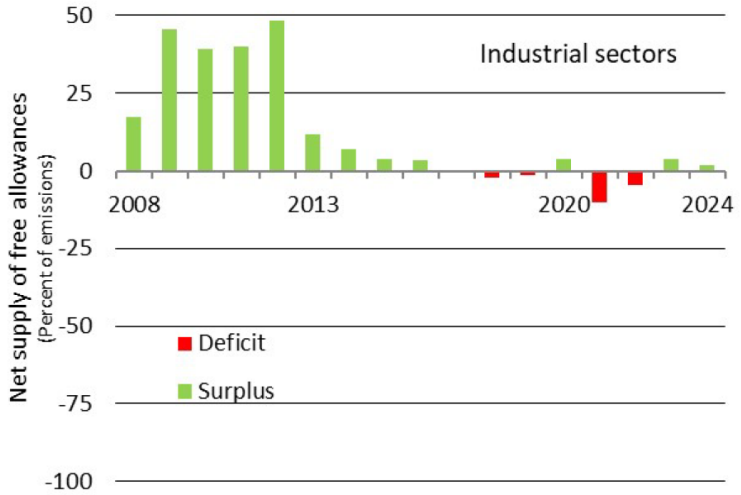
5.1.1. KPI: Balance of Allowances

KPI 5.1: Net supply volume of free allowances – all stationary installations



KPI 5.2: Net supply volume of free allowances – combustion and industry sectors





Source: Wegener Center (2025)based on EUTL

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

Combustion of fuels has activity type code 20 in the EUTL. The remaining activities correspond to 21-99 'All industrial installations'

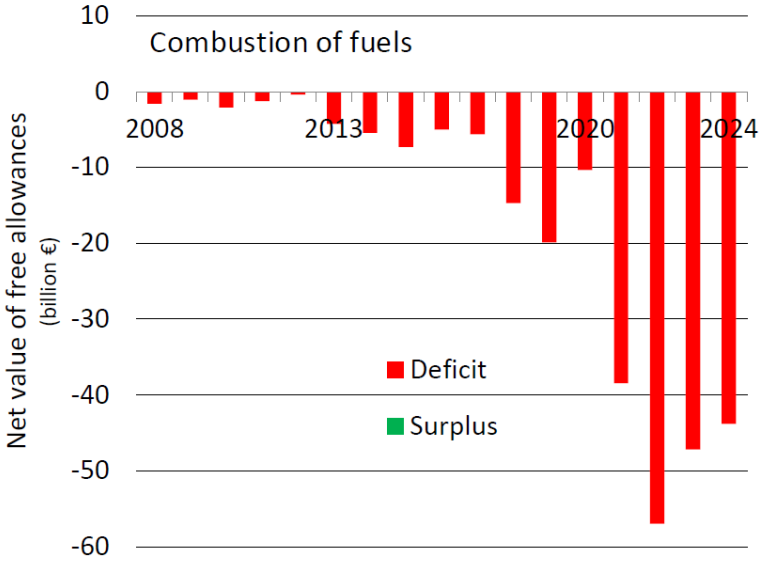
- About **90% of emissions** are **not covered** by free allocations in the **combustion sector**.
- **Industrial** sectors, however, experienced a **surplus** of free allocations during the first trading period, significantly **decreasing** thereafter.
- The deficits in 2021 and 2022 turned into surpluses in **2023** because of the sharp **decrease in emissions** while this may not reflect the output destruction.

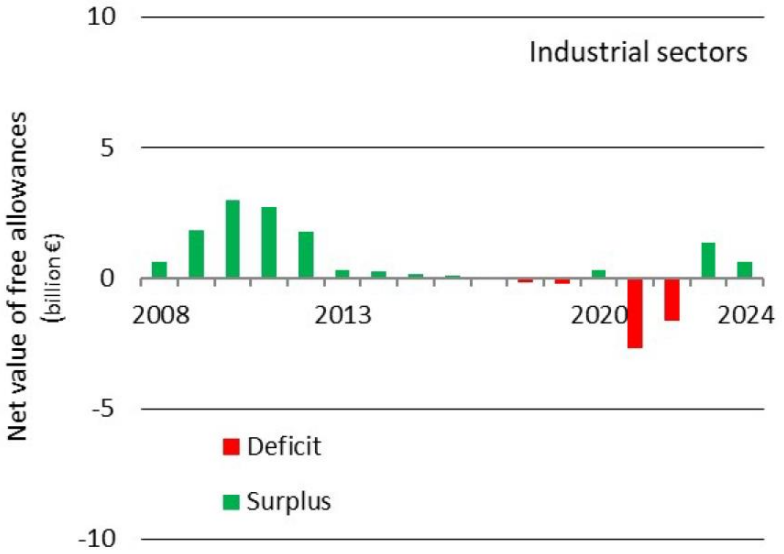
5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.1. KPI: Balance of Allowances

KPI 5.3: Net supply value of free allowances – combustion and industry sectors (bn EUR)





Source: Wegener Center (2025)based on EUTL

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

Combustion of fuels has activity type code 20 in the EUTL. The remaining activities correspond to 21-99 'All industrial installations'

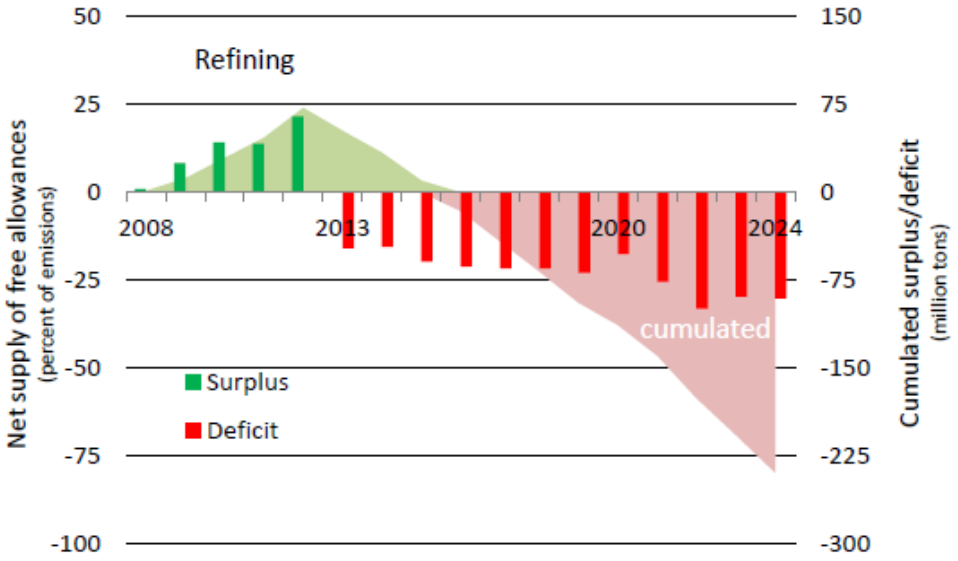
- In the **combustion sector**, annual expenses surpassed EUR 40 billion during the fourth trading period, reaching a cost close to **EUR 60 billion in 2022**.
- For **industrial sectors**, the costs reached up to EUR **3 billion** annually in 2021 and **2022**, while 2023 saw a minor surplus.

5. Competitiveness and Socio-economic delivery

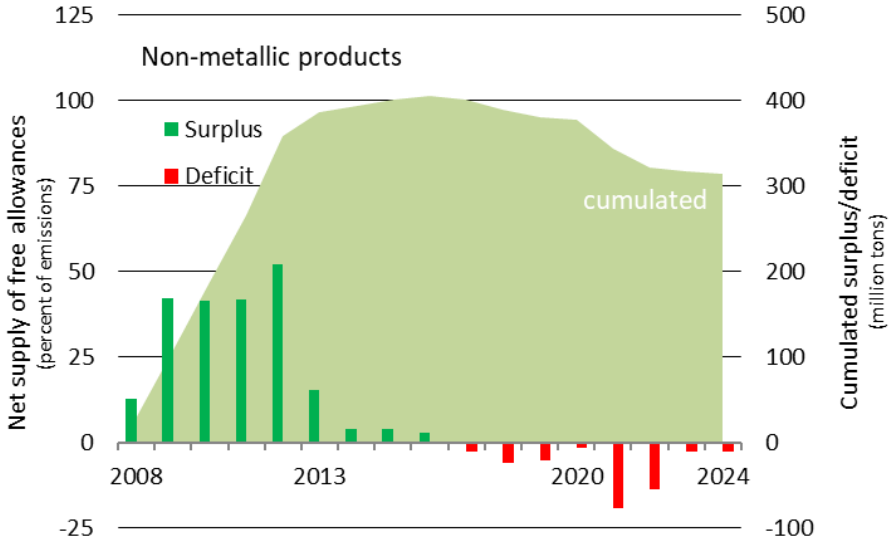
5.1. Economic Impacts

5.1.1. KPI: Balance of Allowances

KPI 5.4: Net supply value of free allowances – all stationary installations



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



Source: Wegener Center based on EUTL (2025)

- **Refineries** (EUTL code 21) 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. However, it is important to note that some emissions from these activities are reported under combustion activities, which do not receive free allowances.

5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.2. KPI: Emission Intensities in selected industrial sectors

A harmonized approach to emission intensities

- A key metric for assessing the economic delivery of the EU ETS is the emission intensity of the covered industrial sectors.
- Emissions intensities are calculated by **Volume of Emissions / Output Production**
- This metric allows to disaggregate emission trends due to output from those due to efficiency gains.

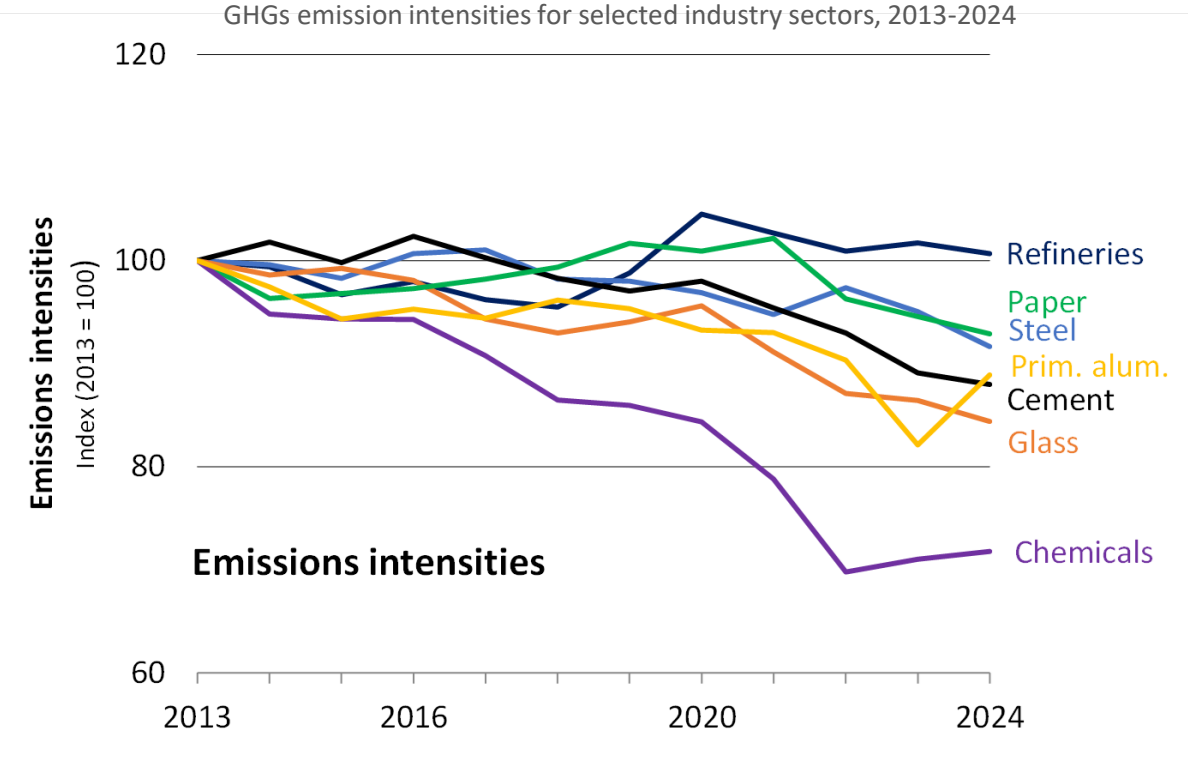
Some caveats

- Although this indicator is highly relevant for judging the progress of various industries towards cutting carbon emissions from energy and processes, it is rather difficult to obtain matching data for this concept.
- **The results very much depend on the choice of production data**
  Whenever available, we used the EUROSTAT industry - annual data [sts_inpr_a__custom_15341976]
- These are available for almost all sectors of interest up to 2024.
- Data from industry associations were added for steel, cement, primary aluminium, and chemicals.
- The emissions intensities calculated cover all countries in the EU ETS (without UK).

5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.3. KPI: Emission Intensities

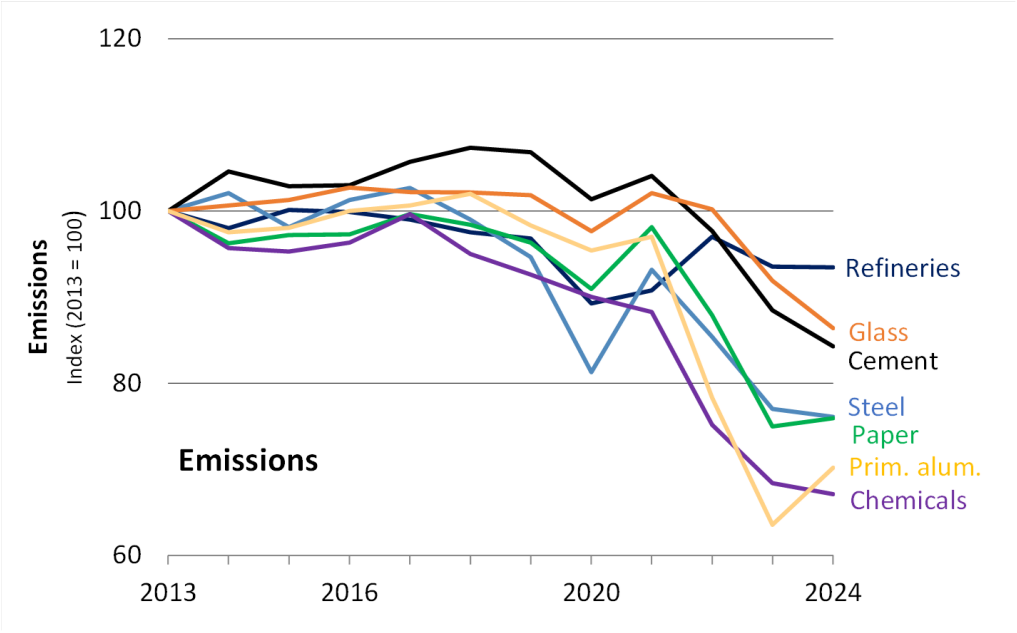


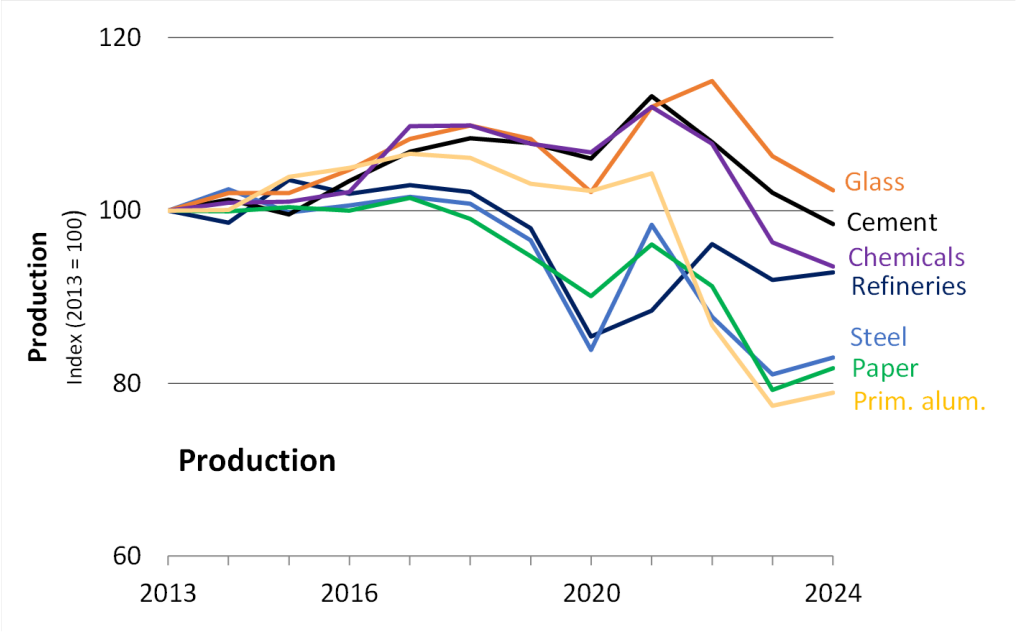
- ***Primary Aluminium:*** *GHGs improvements in relation to energy efficiency of the smelting process, and to the drop in production, especially starting from 2019 (energy crisis and decreasing demand).*
- ***Cement clinker:*** *GHGs improvements as from 2019, motivated by the introduction of dynamic allocation and increasing demand for cements with lower carbon content.*
- ***Chemicals:*** *Current results on emissions intensity trends motivated by high gas prices, lower capacity, and restructuration in the sector after closures.*
- ***Glass:*** *Continuous GHGs improvements across all glass sectors, driven by innovation (especially in flat glass). Increased electrification, decarbonised raw materials, switching to renewable energy and incremental improvements to processes, including energy demand.*
- ***Pulp and paper:*** *Over time GHG improvements are due to the growing share of biomass in the energy mix and improved energy efficiency. In the 2020s, the carbon intensity starts to be driven by output destruction (caused by high energy and raw material prices).*
- ***Refineries:*** *GHGs improvements due to investments in energy efficiency while production remained relatively stable. Less intake of natural gas due to high prices lead to more emissions by using other combustibles or feedstock. This partially off-set the gains in energy efficiency.*
- ***Steel:*** *GHG emissions and production decreased in parallel, mainly due to dynamics in international trade and high energy costs in Europe; abatement options (electric arc furnace and direct reduced iron plants) are highly capex and opex intensive.*

Source:

Primary Aluminium	GHGs: EEA (Code 26);	Production: European Aluminium (Selected Prim. Alum. Installations, PRODQNT (NACE Code 24.42)), EU27+EFTA
Cement clinker	GHGs: EEA (Code 29);	Production: GNR Global Cement Association, 2013=100 Production (volume) tonnes of clinker
Chemicals	GHGs: EEA (Codes 37-44), CEFIC (Selected installations, Codes 1,20);	Production: Eurostat volume index, 2013=100 (NACE Code 20)
Glass	GHGs: EEA (Codes 7, 31);	Production: Eurostat volume Index, 2013=100 (NACE Code 23.1)
Paper and pulp	GHGs: EEA (Codes 35-36);	Production: Eurostat volume Index, 2013=100 (NACE Code 17.1)
Refineries	GHGs: EEA (Code 21), Concawe (Selected installations, Code 20);	Production: Eurostat volume Index, 2013=100 (NACE Code 19.2)
Steel	GHGs: EEA (Code 22-25), EUROFER (Selected installations, Code 20);	Production: Eurostat volume Index, 2013=100 (NACE Code 24.1)

Emissions intensities





5. Competitiveness and Socio-economic delivery

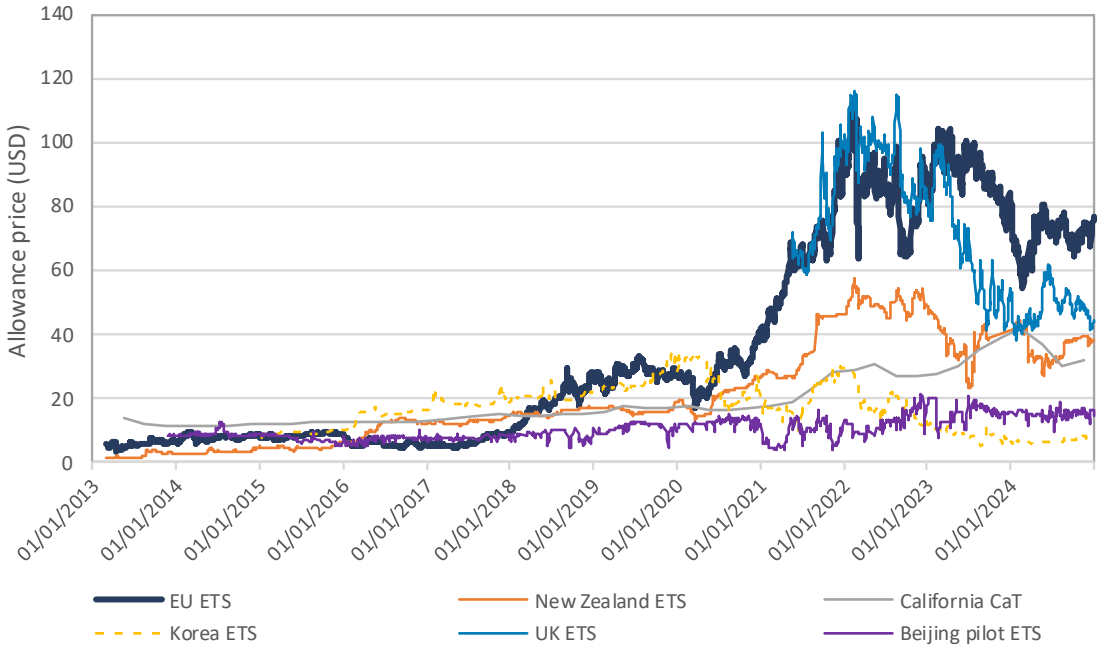
5.1. Economic Impacts

5.1.3. Level of carbon price of EU ETS compared to other jurisdictions

- The combination of a progressively more stringent cap, high EU emission reduction targets, and mature market structure makes the EU ETS the highest-priced carbon market globally.
- In 2024, the EU ETS price is 1.5 times that of the UK ETS, and almost double that of New Zealand ETS and California CaT.
- The price of the EU ETS surged in 2021 due to industrial activity rebounding post-2020 pandemic, the energy crisis and the associated high increase in gas prices as well as renewed strong EU climate ambitions (Fit-for-55 package).

	Start year	Sector coverage	2024 Average Price (USD/t CO2-eq)
EU ETS	2005	Industry, Power, Aviation	70.5
New Zealand ETS	2008	Industry, Power, Waste, Transport, Buildings	36.3
California CaT	2012	Industry, Power, Transport, Buildings	35.2
Beijing pilot ETS	2013	Industry, Power, Transport, Buildings	15.1
Korea ETS	2015	Industry, Power, Waste, Transport, Buildings	6.9
UK ETS	2021	Industry, Power, Aviation	48.2

Evolution of prices of selected ETSs – 2015-2024 (USD/t CO2-eq)



Sources: Compass Lexecon analysis based on data from the International Carbon Action Partnership (ICAP) Allowance Price Explorer and Energy Market Price (for the EU and UK ETS).
Notes: New Zealand ETS is the combination of its pre-2024 and post-2024 ETS. New Zealand, Beijing and Korea ETS prices based on secondary markets.

5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.4. ETS compliance costs, trade & production volumes

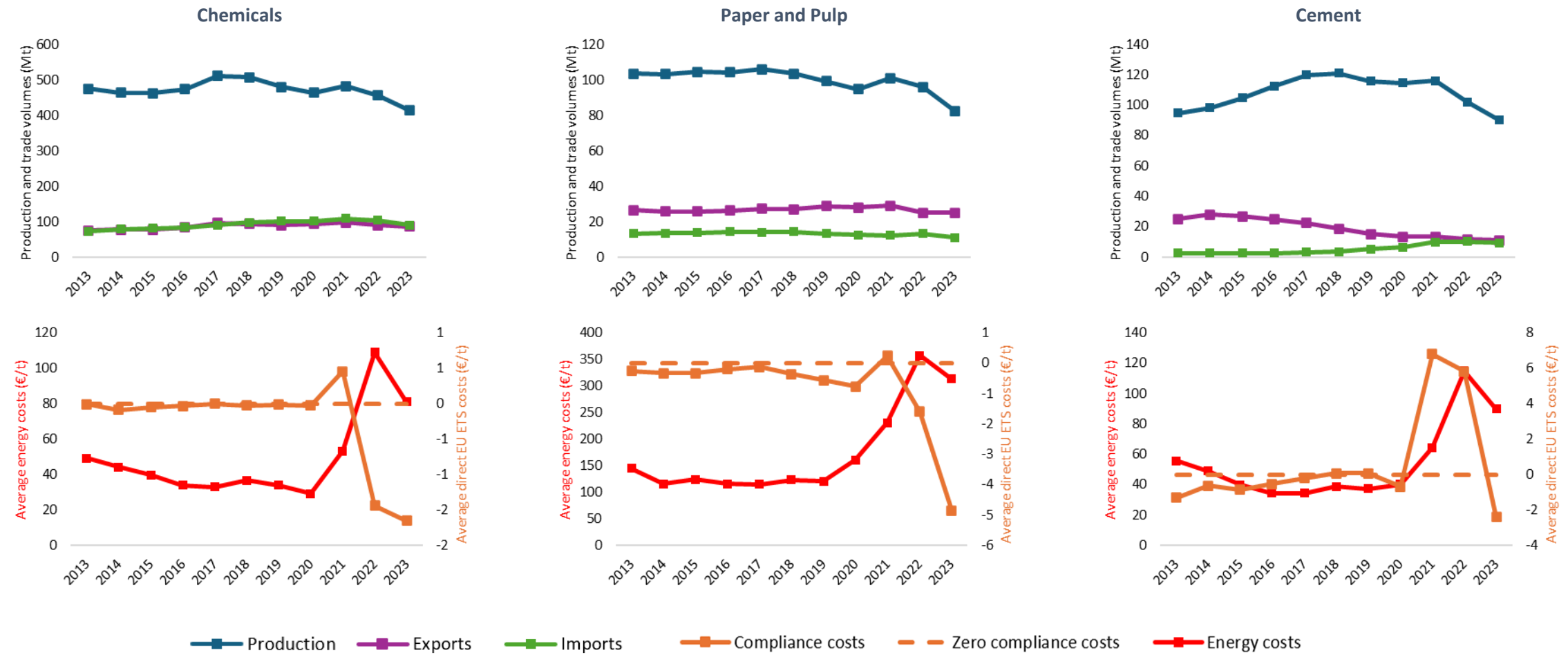
(1) Production, exports, imports & (2) Direct ETS compliance and energy costs – 2013-2023

5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.4. ETS compliance costs, trade & production volumes

(1) Production, exports, imports & (2) Direct ETS compliance and energy costs – 2013-2023



5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.4. ETS compliance costs, trade & production volumes

	Emissions			Production			Exports & Imports		
	Source	Sector	Scope	Source	Sector definition	Scope	Source	Sector	Scope
Aluminium	EEA	26: Production of primary aluminium 27: Production of secondary aluminium (Not including selected code 20 installations due to lack of available information as of now)	EU27 (EEA available)	EUROSTAT PRODCOM Total Production	24421130: Unwrought non-alloy aluminium (excluding powders and flakes) 24421154 Unwrought aluminium alloys (excluding aluminium powders and flakes)	EU27* (Norway and Iceland available for most years)	EUROSTAT EU trade since 2002 by CPA 2.1	2442-Aluminium	Trade between EU27 and Extra-EU27 (2020)
Steel		22: Production of Coke 23: Metal ore roasting or sintering 24: Production of pig iron or steel 25: Production or processing of ferrous metals + Selected code 20 installations (waste gases)		(1) EUROSTAT PRODCOM Total Production (2) Eurofer	(1) 2410T110: Pig iron (2) Crude steel	EU27		241-Basic iron and steel and ferro-alloys	
Chemicals		38: Production of nitric acid 39: Production of adipic acid 40: Production of glyoxal and glyoxylic acid 41: Production of ammonia 42: Production of bulk chemicals 43: Production of hydrogen and synthesis gas 44: Production of soda ash and sodium bicarbonate + Selected code 20 installations (with EU ETS scope)		ERCST with data from CEFIC	NACE code 20	EU27 (Norway available)		20-Chemicals and chemical products	
Paper and pulp		36: Production of paper or cardboard 35: Production of pulp31 Manufacture of glass + Code 7 installations provided by ERCST and extracted from EU ETL, excluding GB (Note: code 31 installations from the same source do not match EEA data)		ERCST data with 2023 volume from CEPI and the use of NACE indexes	NACE code 171	EU27 (Norway available)		171-Pulp, paper and paperboard	
Glass		31 Manufacture of glass + Code 7 installations provided by ERCST and extracted from EU ETL, excluding GB (Note: code 31 installations from the same source do not match EEA data)		Glass Alliance	Glass	EU27		231-Glass and glass products	
Cement		29 Production of cement clinker		ERCST with data from GNR (and NACE index for 2023)	Cement clinker	EU27		2351-Cement	

Source: CL based on discussions with ERCST. Annual allowance prices from Sendeco.
Note: *Norway and Iceland represent a large share of European aluminium production; however, their production volumes were not considered in the analysis due to the inability to identify the share of EU imports coming from these 2 countries.

5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.4. ETS compliance costs, trade & production volumes

		Source	Methodology	Scope
Energy consumption	**Steel**	EUROSTAT Simplified energy balances	Taken as-is Available for 2013-2023 for the 3 sectors directly as well as non-ferrous metals and non-metallic minerals	EU27 – 2013-2023 (Norway and Iceland available)
	Chemicals			
	Paper and pulp			
	Aluminium	EUROSTAT Disaggregated final energy consumption in industry by NACE Rev. 2 activity - quantities	1) Energy consumption volumes of each sector available only for 2020-2022 per type of energy source 2) Calculation of the share of the yearly consumption volume of each sector compared to the yearly consumption volume of the broader category available in the EUROSTAT - Simplified energy balances: - Aluminium: the energy consumption was estimated as the share of the energy consumption of **non-ferrous metals** - Glass and Cement: the energy consumption was estimated as the share of the energy consumption of **non-metallic minerals** 3) Calculation of the share of each energy source in the total mix of consumption per year for 2020-2022 and applying averages to the sectoral yearly average of the energy consumption (compared to the corresponding broader category) 4) Obtained average percentages were applied across all missing years (2013-2023) 5) Sanity checks were conducted	EU27 – 2020-2022 (Norway available)
	Glass			
	Cement			
Energy prices	**Solid fossil fuels**	CL EMP data	Coal ARA CIF spot EUR/MWh	Spot price
	Manufactured gases	No	Manufactured gases are considered as produced and reused internally during the industrial processes	-
	Peat and peat products	CL EMP data	Coal ARA CIF spot EUR/MWh (not considered in Enel)	Spot price
	Oil shale and oil sands	CL EMP data	Brent EUR/MWh (converted from USD/bbl.)	Spot price
	Natural gas	EUROSTAT	Gas prices for non-household consumers - bi-annual data: Consumption 4 000 000 GJ or over - band I6	EU27
	Oil and petroleum products (excluding biofuel portion)	CL EMP data	Brent EUR/MWh (converted from USD/bbl.)	Spot price
	Renewables and biofuels	CL analysis – Softwood 2020-2022	2020-2022 values estimated from internal analysis 2013-2019 values as half 2020 values due to known price surge due to Covid and energy crisis (where prices more than tripled) Softwood (biomass) corresponds the most to raw materials for paper and pulp	EU27
	Non-renewable waste	CL analysis – Softwood 2020-2022	Values taken as 50% of renewables and biofuels	EU27
	Electricity	EUROSTAT	Electricity prices for non-household consumers - bi-annual data: Consumption 150 000 MWh or over - band IG	EU27
	Heat	No	Heat is considered as produced and reused internally during the industrial processes	-

Source: CL based on discussions with ERCST. Annual allowance prices from Sendeco.

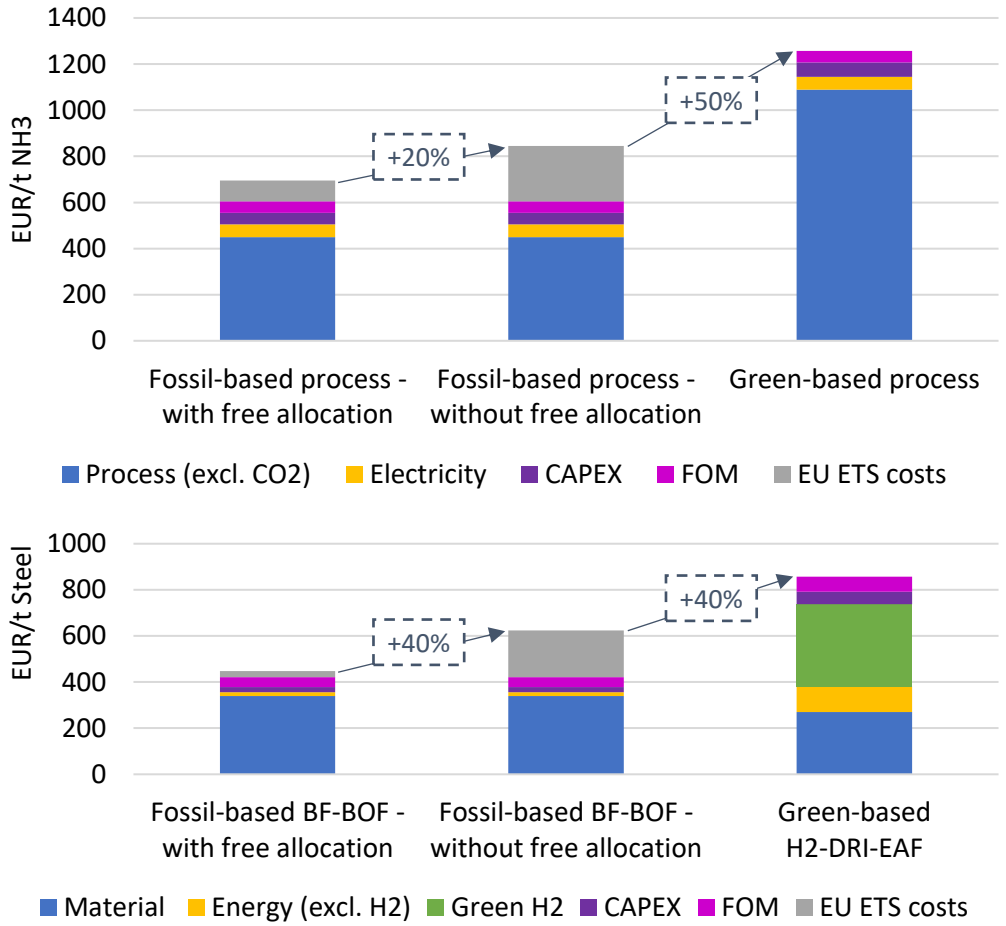
5. Competitiveness and Socio-economic delivery

5.1. Economic Impacts

5.1.5. Carbon compliance cost in unit production costs

- 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.
  - The phase-out of free allocation, combined with the expected increase in EUA prices, would increase costs for producers – which highlights the impact of EU ETS on EU competitiveness – as of 2030, the removal of free allocation would increase costs by (a) 20% for ammonia and (b) 40% for steel.
  - Decarbonised production processes would be more expensive than carbon-intensive processes – as of 2030, even when assuming low green hydrogen costs, (a) green steel would be 40% (80%) more expensive while (b) green ammonia would be 50% (90%) more expensive, compared to fossil-based processes with no free allocations (with free allocations).
- 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.

Production costs for ammonia and steel by cost component under different scenarios – 2030

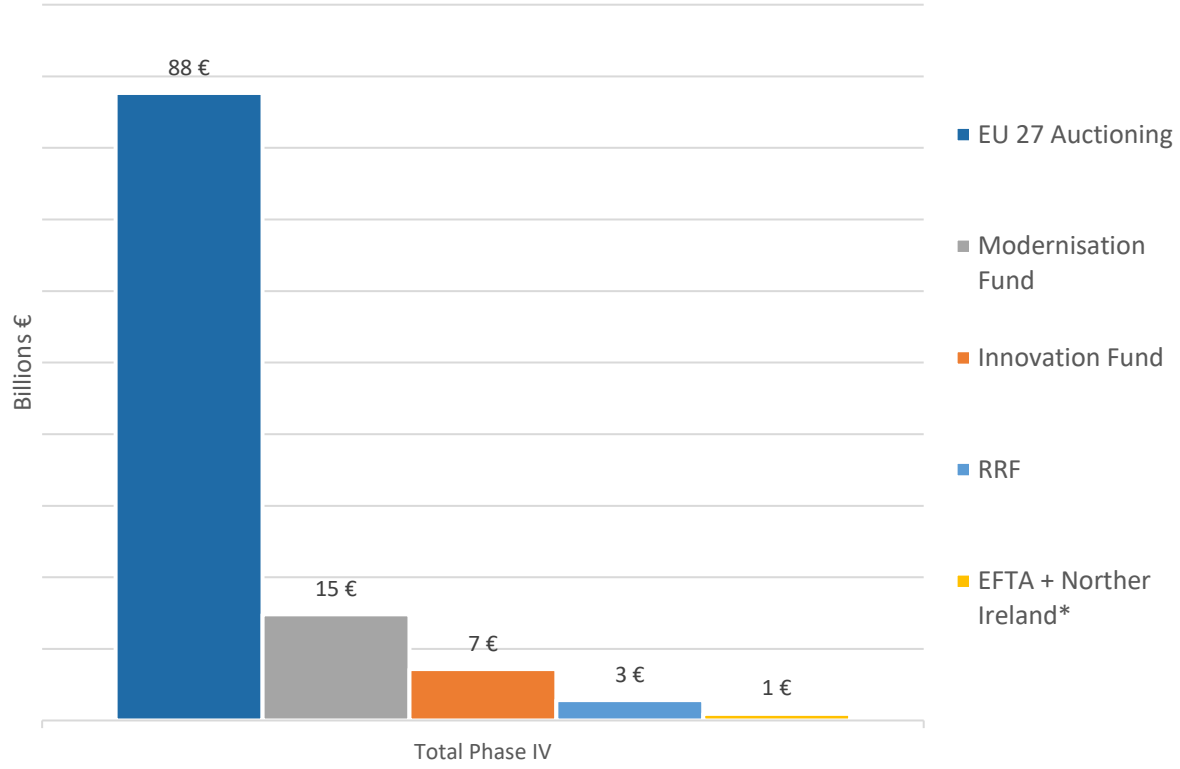


Sources: Compass Lexecon analysis based on data from AgoraEnergiewende for Steel and BusinessEurope for Ammonia. The C-intensive Steel making facility is assumed to be a retrofit BF-BAF with coking coal. Grey Ammonia is produced based on SMR + Haber-Bosch synthesis.

5. Competitiveness and Socio-economic delivery

5.2. Auction revenue income

Figure 5.6: Total EU ETS generated income in Phase IV and distribution between budgets (2021-2023)



In Phase IV, the total EU ETS revenue income amounted to EUR **112.8 billion**.

- Of this, **EUR 88 billion** went directly to the EU Member States **national budgets**.
- EUR 14.81 billion the ETS **Modernisation Fund**,
- EUR 7.2 billion supplied the ETS **Innovation Fund.**
- EUR **2.8 billion** supplied the Recovery and Resilience Facility (**RFF**) in 2023, to contribute to the EUR 20 billion objective, following the adoption of REPower EU in 2022.
- The remaining EUR 0.94 billion went to **Iceland, Liechtenstein, Norway** and **Northern Ireland***.

Source: European Commission reports on the functioning of the European carbon market (2022-2024)

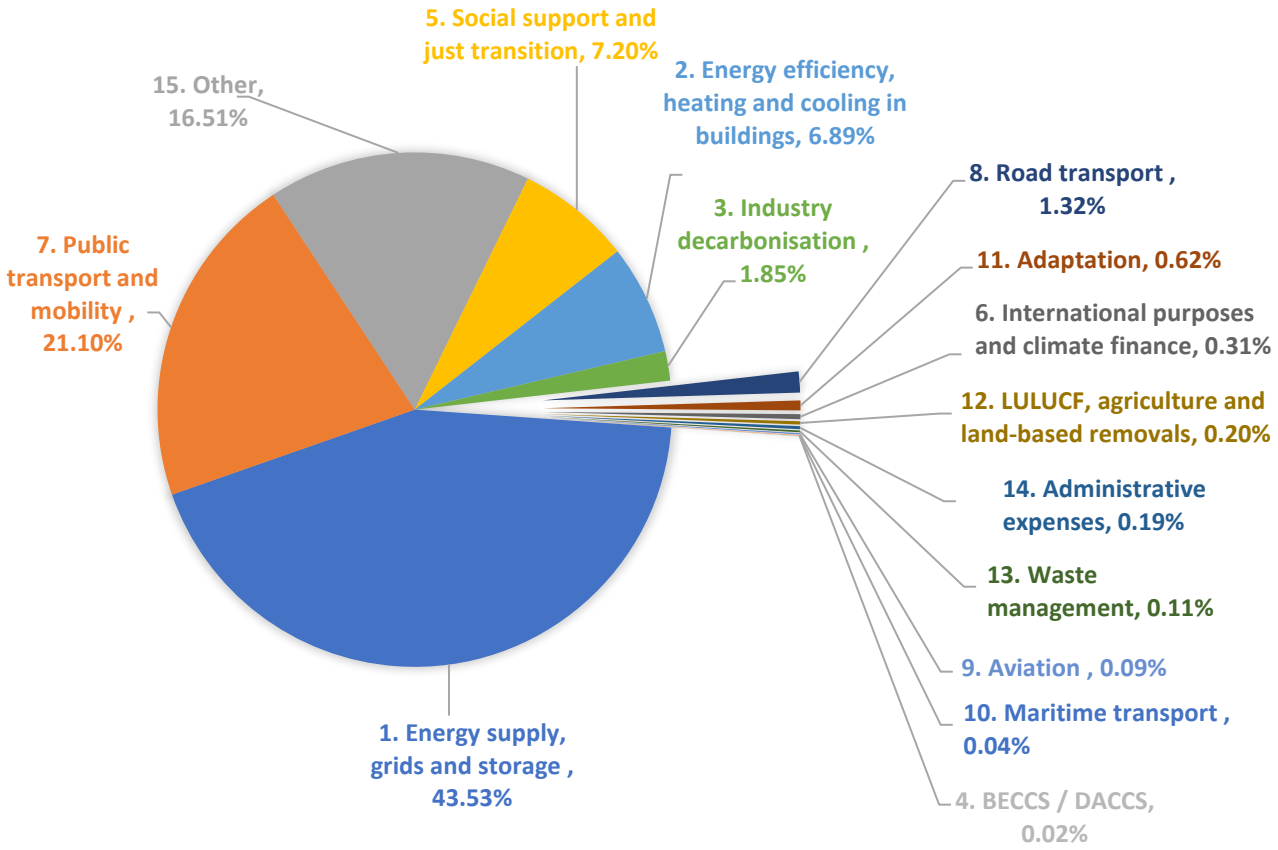
** As from 2022, EEX also auction allowances for electricity generation plants in Northern Ireland, which are part of the EU ETS as from 2021.*

5. Competitiveness and Socio-economic delivery

5.3. Measures to address Competitiveness

5.3.1. Member State auction revenues and use

Figure: EU ETS reported MS auction revenues EU 27 per category (2024 reporting, 2023 data) (%)



- Following the 2023 revision of the EU ETS (Art 10 (3)) and in line with **Regulation (EU) 2024/1281** (Annex I), Member States reported the use of their auction revenues following **new** harmonised **categories** (1-15).

- In 2023, close to half of EU ETS reported revenues (**43%**), **was spent on 'Energy supply, grids and storage',** followed by 'Public transport and mobility'(21%), 'Others'* (16%), and **'Social support and just transition' (7%).**

**Reporting data restricted from public view in Cyprus.*
***Examples of others include Climate Leap Programme for non-EU ETS sectors (SE), support to local authorities (BE), biodiversity (ES, HR), reported indirect carbon cost compensation (FI,SI,SK,RO,PT), geographical and territorial information (PT), Sustainable Development Fund (MT), biogas (LT), R&D in Green Technologies (DE, EE).*

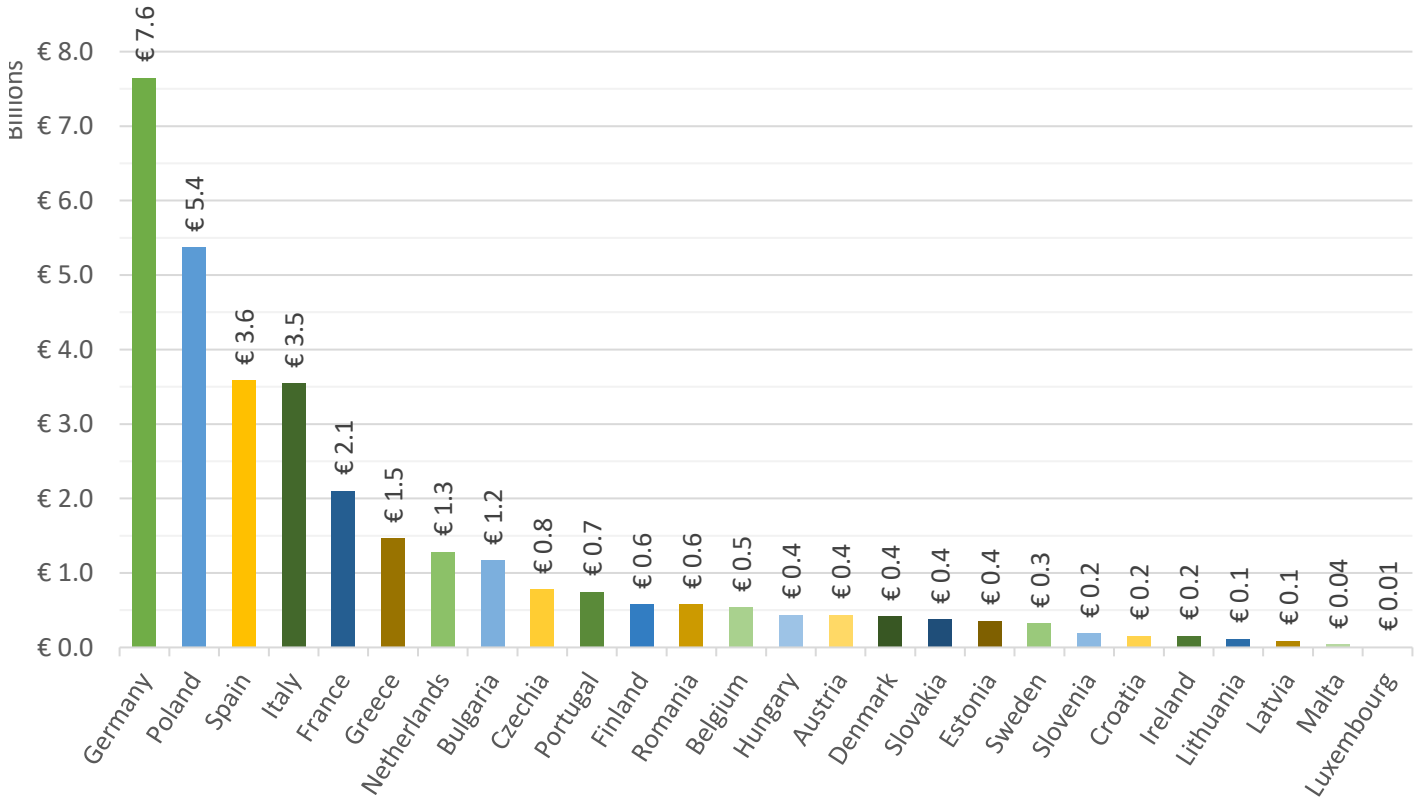
Source: ERCST (2024), based on use of EU ETS auction revenues (reporting years 2024), GovReg, EEA. Table 3.

5. Competitiveness and Socio-economic delivery

5.3. Measures to address Competitiveness

5.3.1. Member State auction revenues and use

Figure: EU ETS reported MS auction revenues EU 27 (2024 reporting, 2023 data)



- EU ETS reported revenues in 2024 for auctioning (excluding MF and IF) in 2023, reached **32 Billion/EUR** in 2024*.
- While no direct attribution is made to **ETS1 sectors**, categories 1 (Energy supply), 3 (Industry decarbonisation), 4 (removals),9 (aviation) ,10 (maritime) reached **45.54% of total reporting revenues.**
- **Netherlands** (with 49% of total revenues), **Belgium** (18%) and **Croatia**, were the only MSs that reported expenditures under category 3 (**industrial decarbonisation**).

**Although MS are now reporting specific categories, it still does not allow us to compare category spending across MS effectively as some MS, such as Germany , overreport their revenue spending, whilst other MS under-report, as direct attribution of revenues to specific purposes is not always possible. In Germany all revenues go to a fund for climate and energy projects, which is additionally co-funded from the general budget. Thus, reporting per category (20 Billion/EUR) is higher than EU ETS auction revenues (7 Billion/EUR).*

Source: ERCST (2024), based on use of EU ETS auction revenues (reporting years 2024), GovReg, EEA. Table 3.

5. Competitiveness and Socio-economic delivery

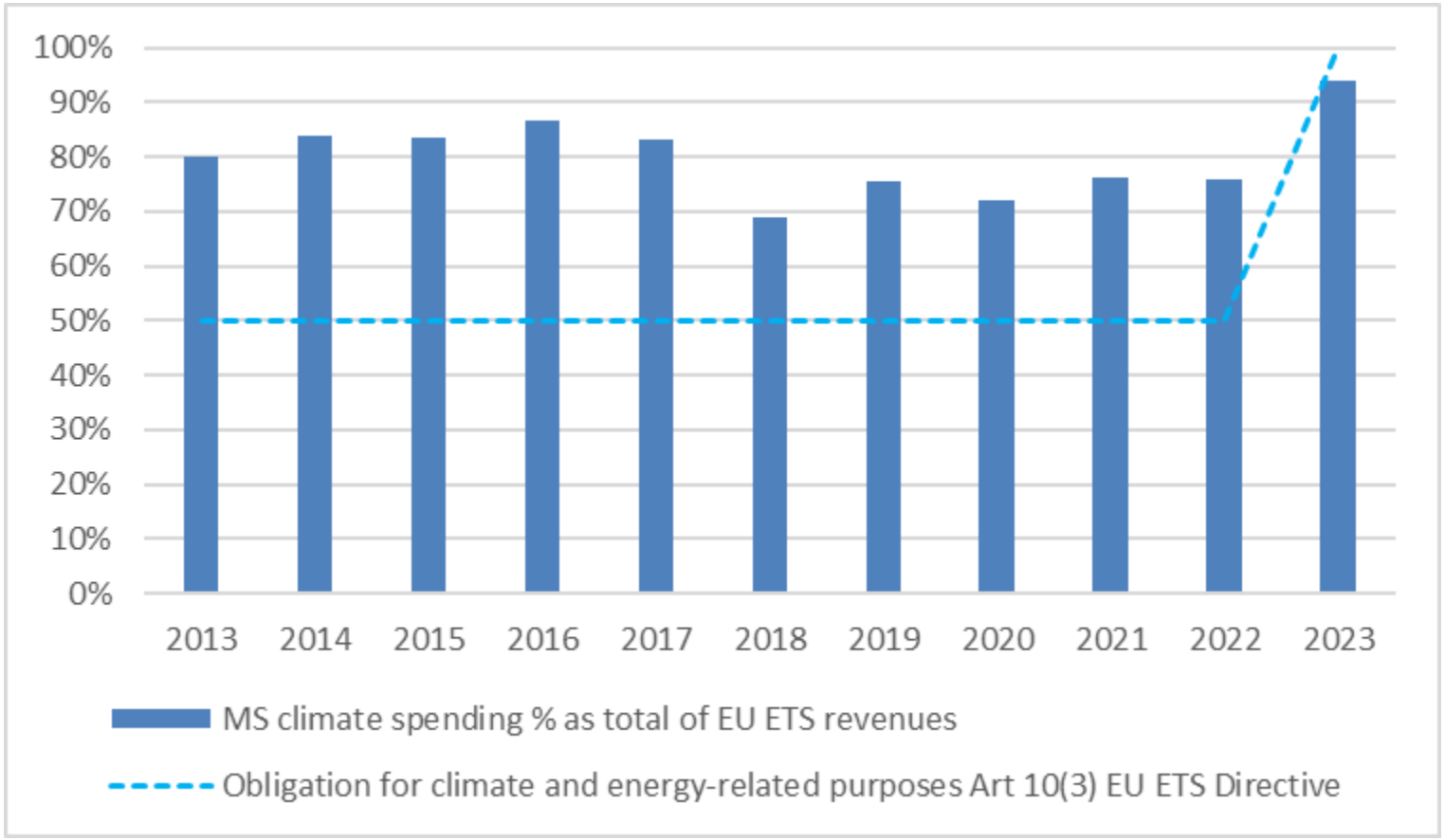
5.3. Measures to address competitiveness

5.3.1. Member States auction revenues and use

- Until the last revision of the EU ETS Directive, at least 50% of the auction revenues that goes directly to Member States, **to climate- and energy-related purposes**.

- Following the revision of the EU ETS Directive in 2023, **Member States are now obliged to use 100%** (except revenue for indirect cost compensation (Art 10 (3) of the EU ETS Directive).

KPI: % of total MS auction revenues spent on climate, renewable energy and energy efficiency (2013-2023)



Source: EEA (2024), *Use of auctioning revenues generated under the EU Emissions Trading System*, December.

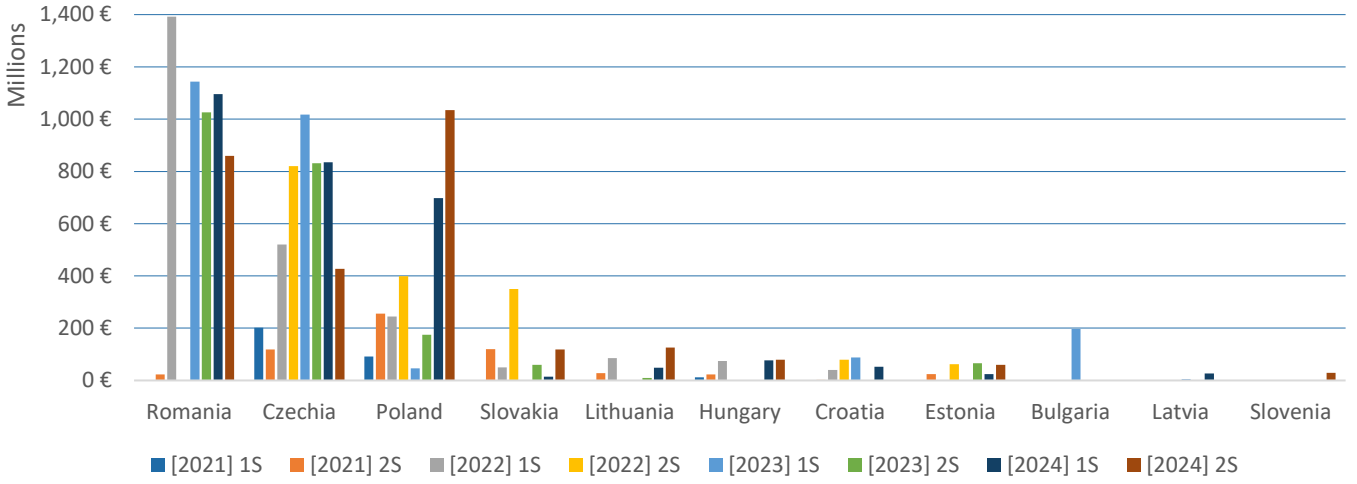
5. Competitiveness and Socio-economic delivery

5.3. Measures to address Competitiveness

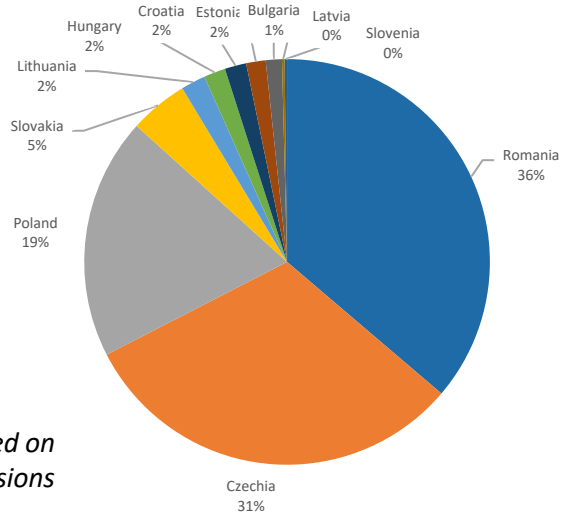
5.3.2. Modernisation Fund

- EU ETS revenues to support **13 low-income EU Members** in their transition to climate neutrality by helping to modernise their energy systems and efficiency.
- From 60% to **75% below GDP** per capita: Since 2023 revision Portugal, Greece and Slovenia can also ask for funding, with only **Slovenia applying** so far **in 2024.**
- So far 8 disbursements decisions, amounting to **15 billion €.**
- Overall, **Romania** (5.5 billion EUR) and **Czechia** (4.8 billion EUR) have been main beneficiaries, followed by **Poland** (3 billion EUR).
- In **2024**, Romania was also the main beneficiary (1.9 billion EUR), but **Poland surpassed Czechia** over the two disbursement cycles (1.7 billion EUR and 1.3 billion EUR).

Modernisation Fund - Disbursement Decisions per MS (2021-2024)



Distribution of funding received from the Modernisation Fund per Member State (2021-2024)



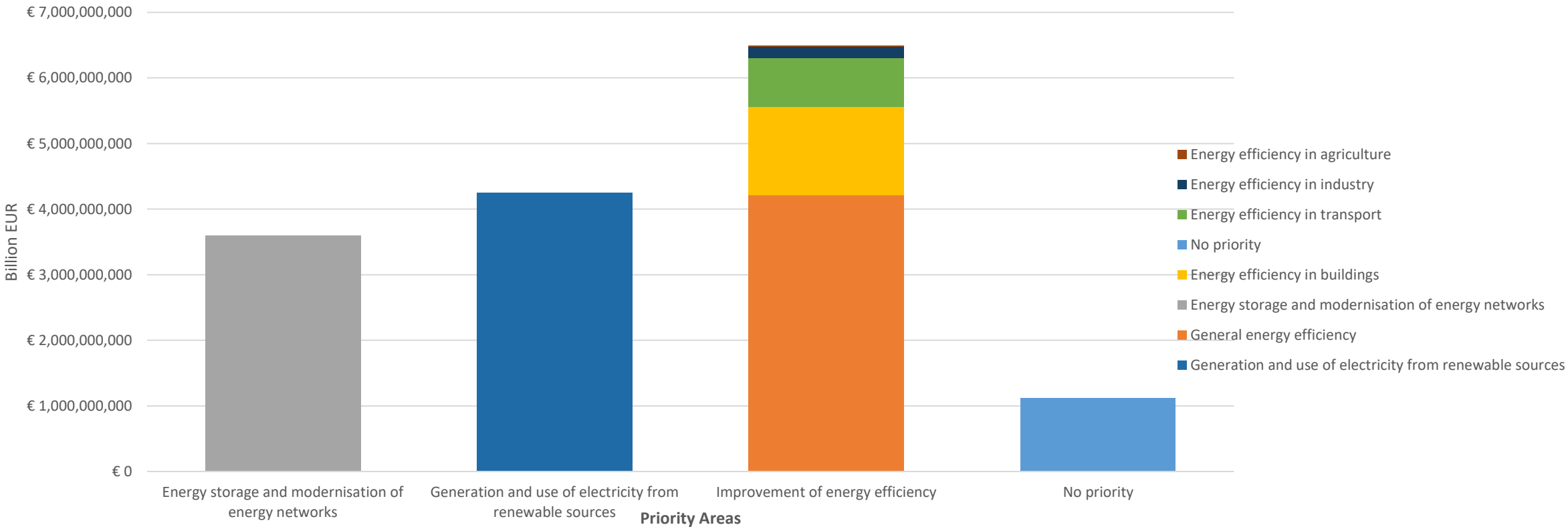
Source: ERCST, elaboration based on disbursement decisions

5. Competitiveness and Socio-economic delivery

5.3. Measures to address Competitiveness

5.3.2. Modernisation Fund

Figure: Modernisation Fund investments by area, as reported by Member States (2021-2024)



Investments in priority areas as aligned with **Article 10d(2) of the ETS Directive.*
***Due to MS reporting, some projects cannot be attributed to single priority areas. In these cases, we assigned a single priority area based on project description. 44 out of the 215 projects have +1 priority areas with total value of EUR 3,988,400,061*
**** Non-priority, investments qualifying for the Modernisation Fund but falling outside the priority areas*

Source: ERCST, based on Modernisation Fund Disbursement Decisions. https://modernisationfund.eu/investments/

5. Competitiveness and Socio-economic delivery

5.3. Measures to address Competitiveness

5.3.3. Innovation Fund

Figure 5.15: Innovation Fund funding by sector and call year (2021-2024)

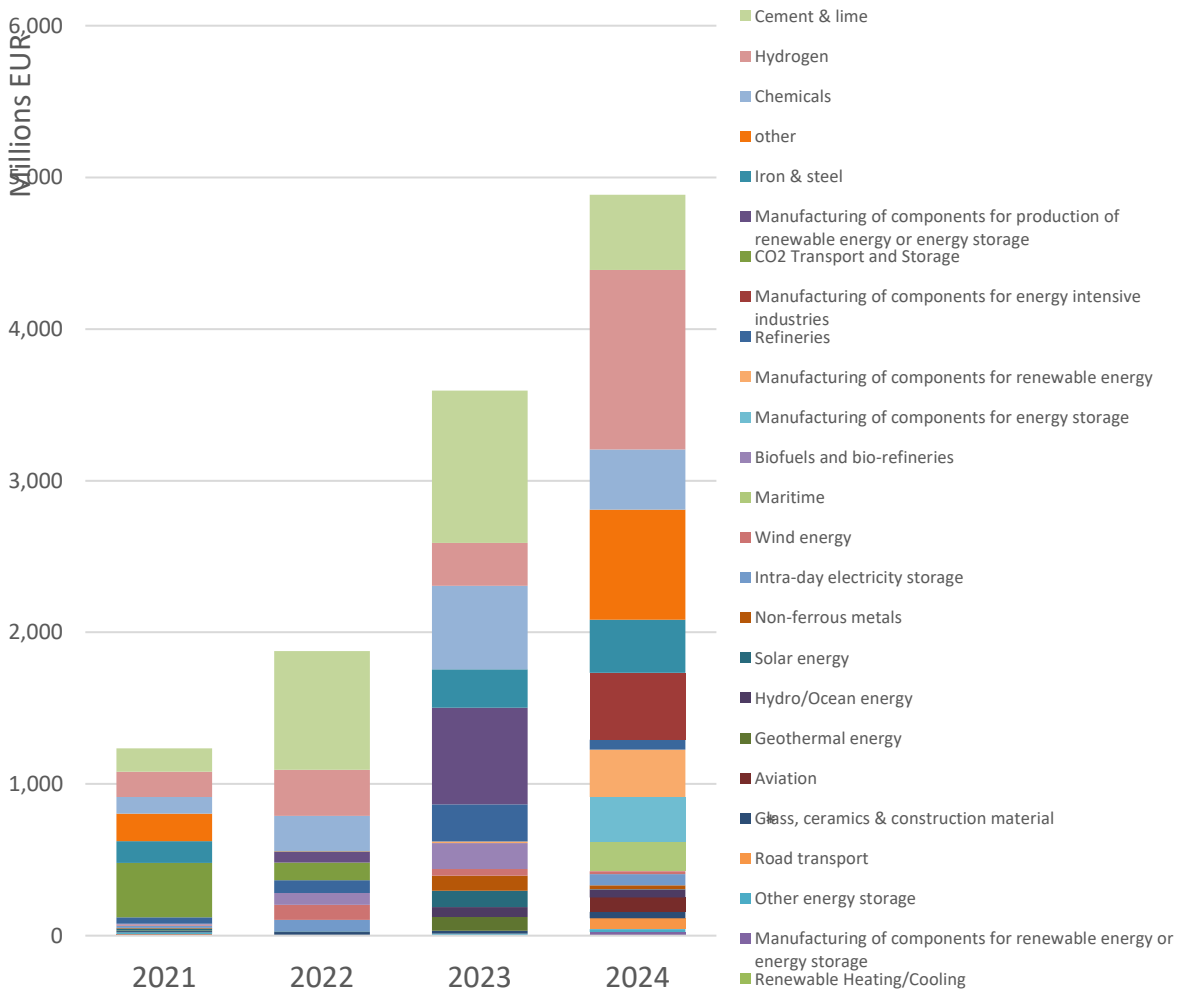
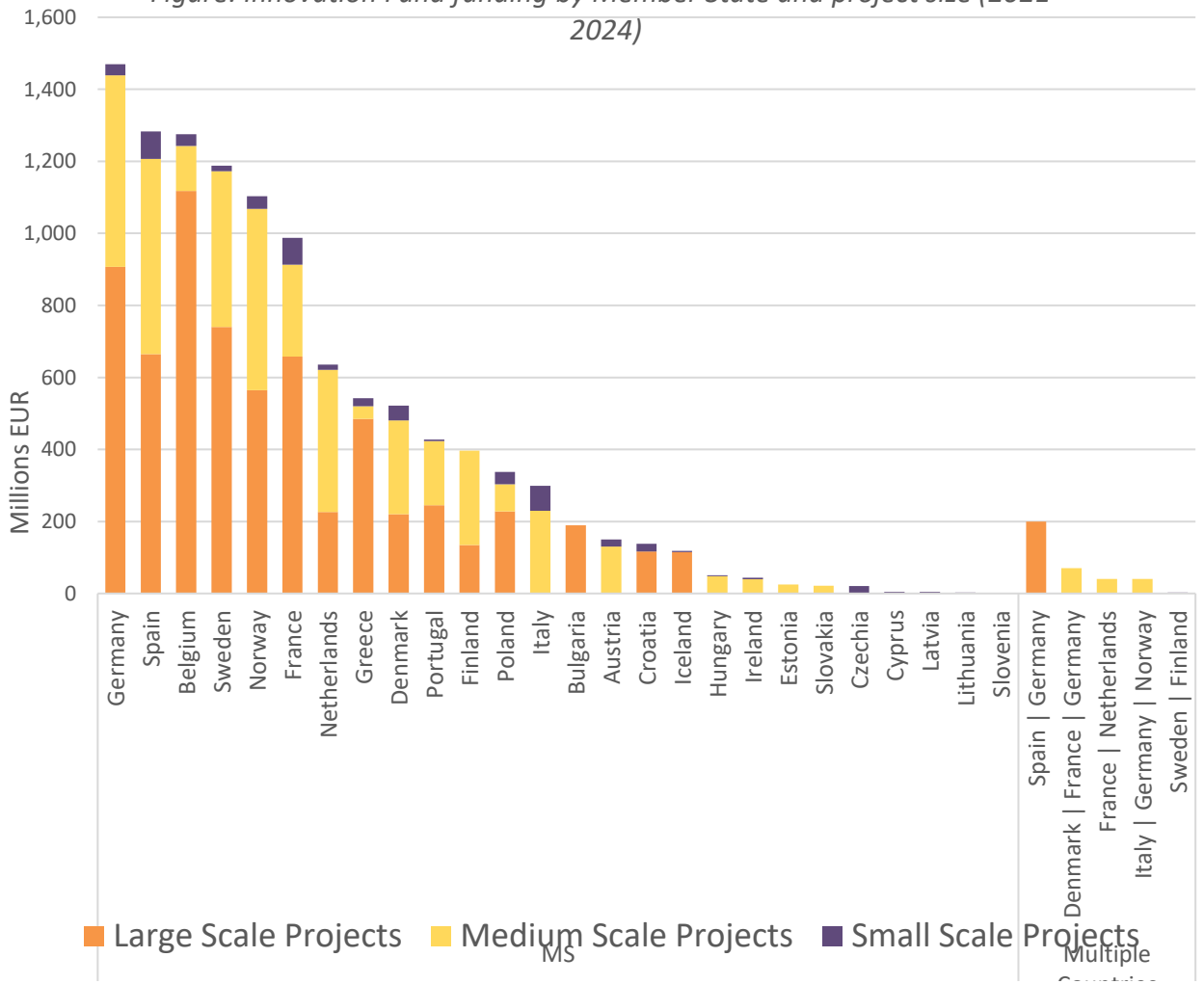


Figure: Innovation Fund funding by Member State and project size (2021-2024)



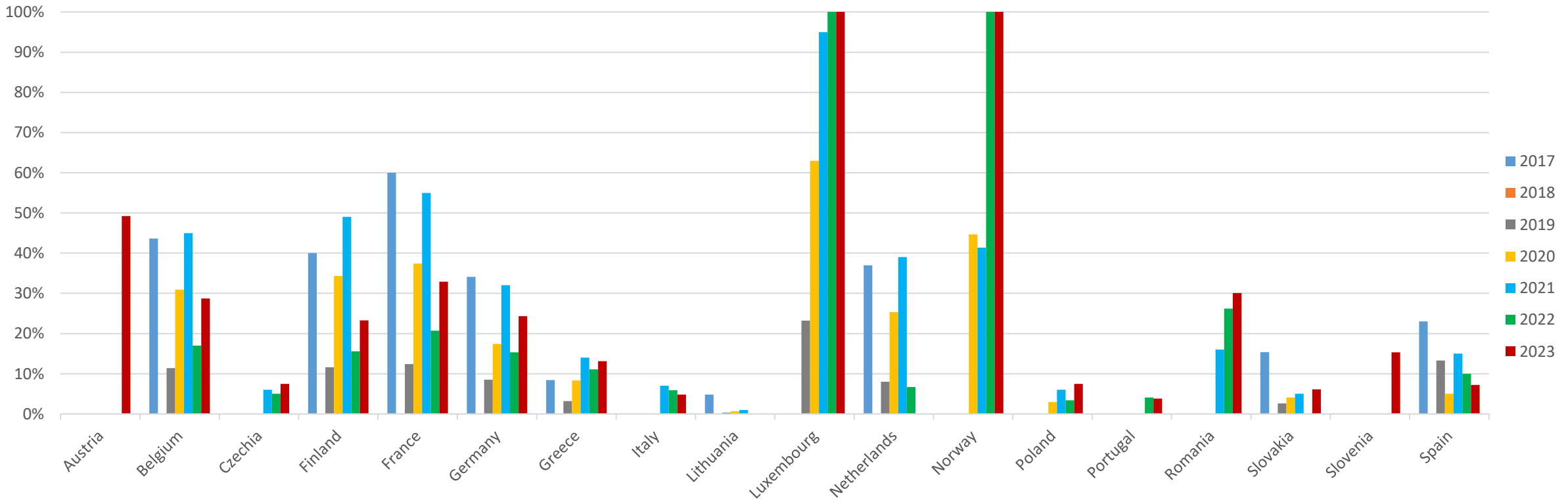
***Note: LSP: > €100 million, MSP: €100 million - €20 million, SSP: < €20 million. 'Medium Scale Projects' is a new category starting in 2024. ***Note: Projects across multiple Countries*

Source: ERCST (2025), based on Innovation Fund project portfolio dashboard, 2025

5. Competitiveness and Socio-economic delivery

5.3. Measures to address Competitiveness
5.3.4. Indirect Cost Compensation

KPI: % of MS auction revenues spent on indirect costs EU 27 + Norway (2017-2023)



**Luxembourg over share of auction revenues spent on indirect costs in 2022 and 2023, was 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, while in Norway, indirect cost is partly financed by the Norwegian government's revenues from EU ETS and from the general budget.*

** Norway did not join the European ETS auction platform until June 2019 and therefore EUAs auctioned were reported as zero in 2017-2019. Source EEA (2019) Trends and projections in the EU ETS in 2019. Pp 49.*

***Total indirect cost compensation** paid out by MS in **2017-2023 raised to 11.55 billion EUR**.*

Source: ERCST (2024). Based on reports from the European Commission on the functioning of the European carbon market. Indirect compensation values for Norway are taken from: Veyt (2024) Norway shelves GO exit, yet fails to stimulate terawatts of demand (Updated). August 27.

6. Market functioning

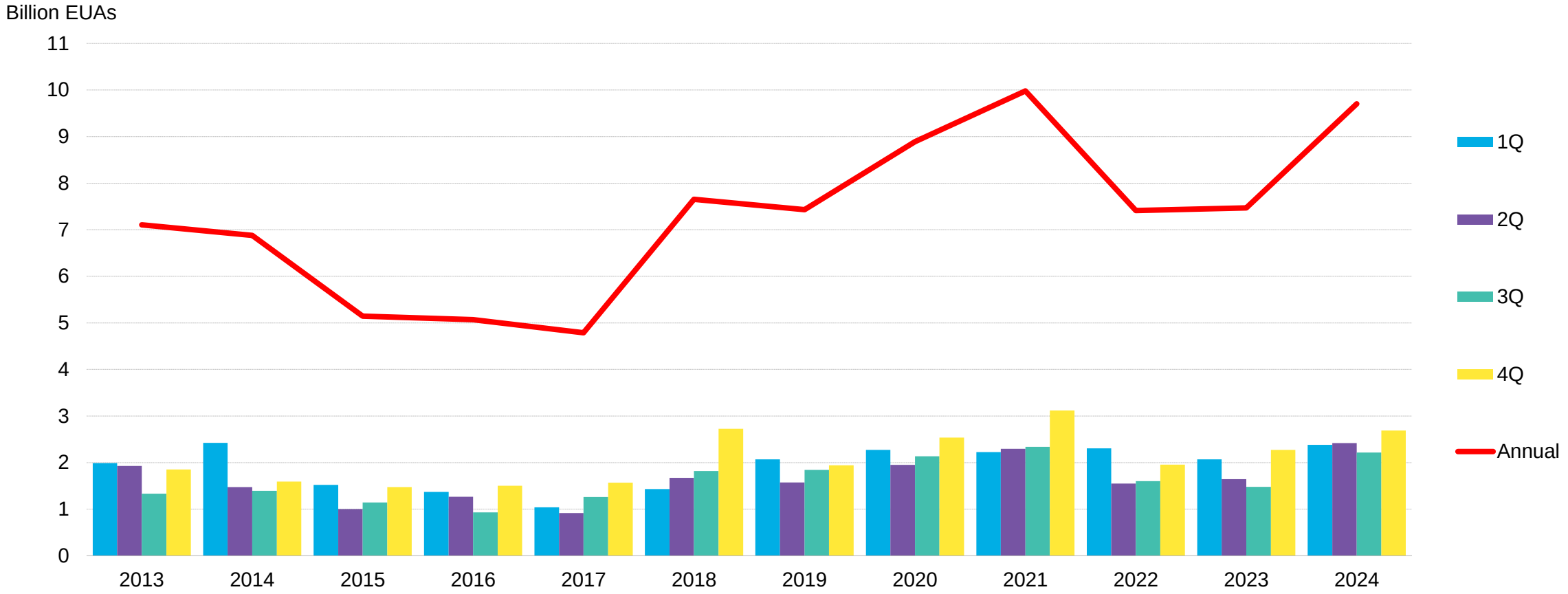
6.1 KPI: Market functioning trackers

Indicator	2022/23	2023/24
Volume		
Open interest		
Auction participation		
Auction coverage		
Auction-spot differential		
Cost of carry		
Ask-bid spread		
Volatility		
Liquidity		

Source: BloombergNEF. Note: Green indicates improvement, red worsening, amber stable.

6. Market functioning

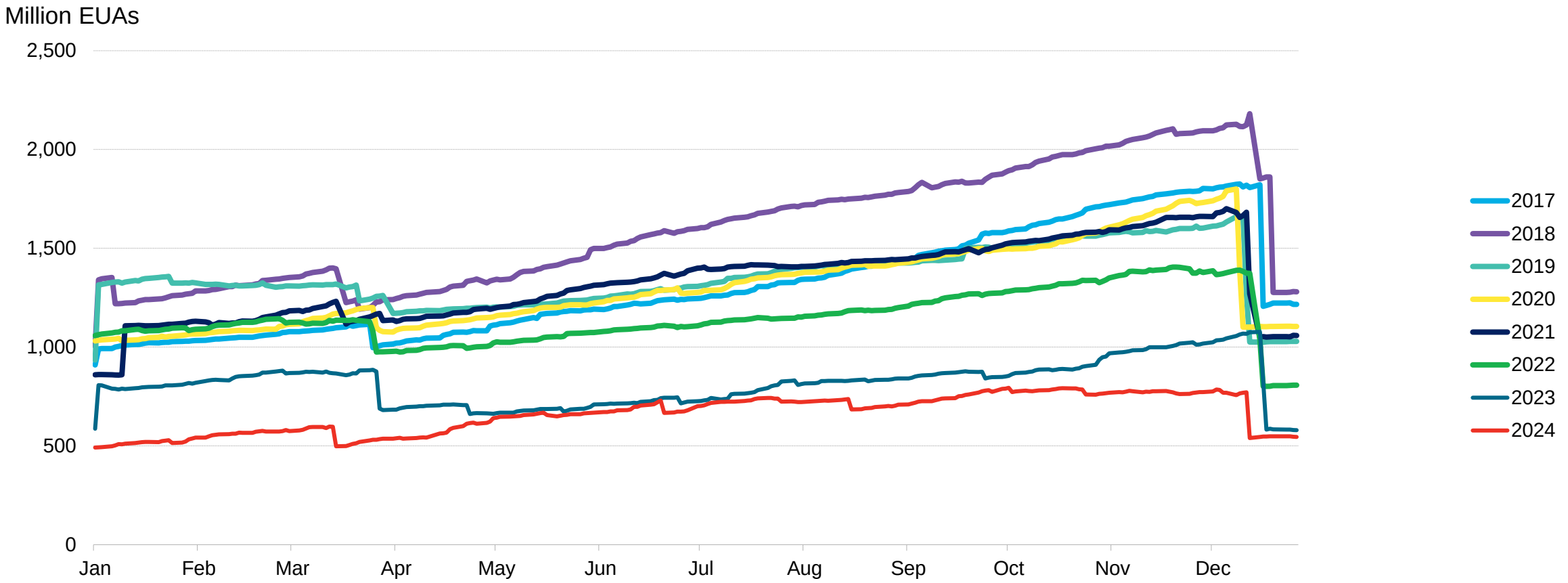
6.1.1 KPI: Traded volume



Source: ICE, EEX, BloombergNEF.

6. Market functioning

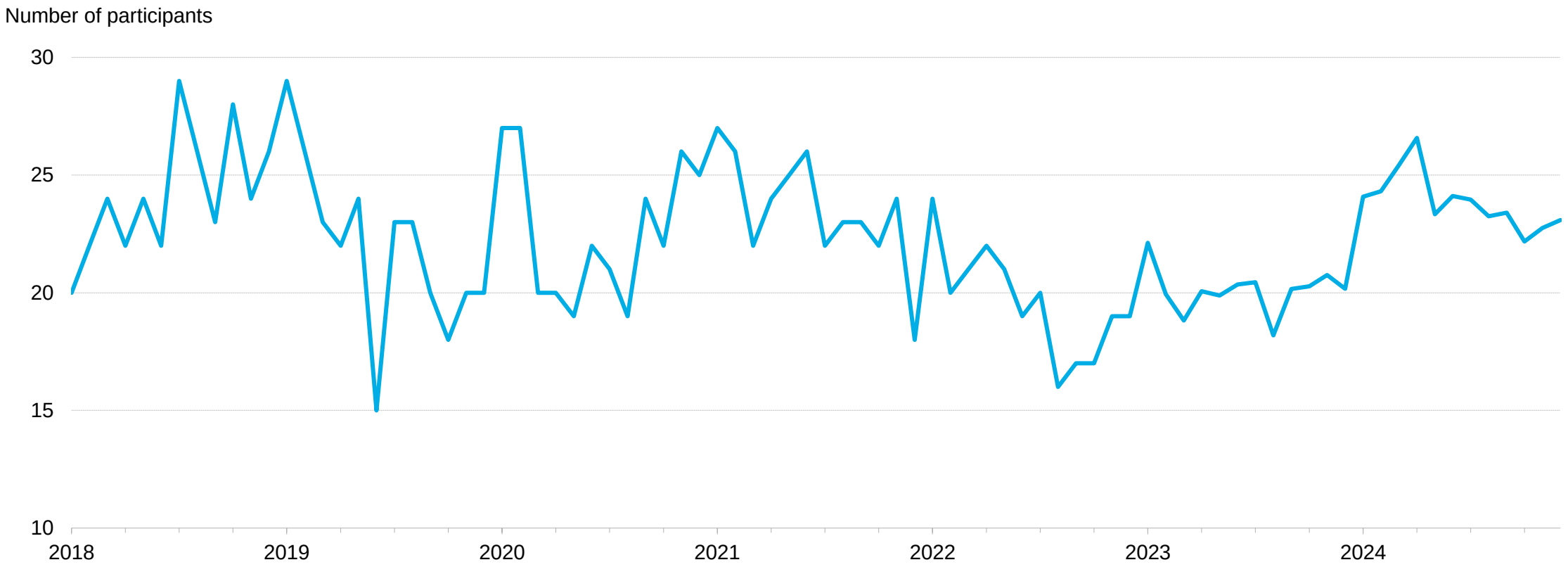
6.1.2 KPI: Aggregate open Interest



Source: ICE, EEX, BloombergNEF.

6. Market functioning

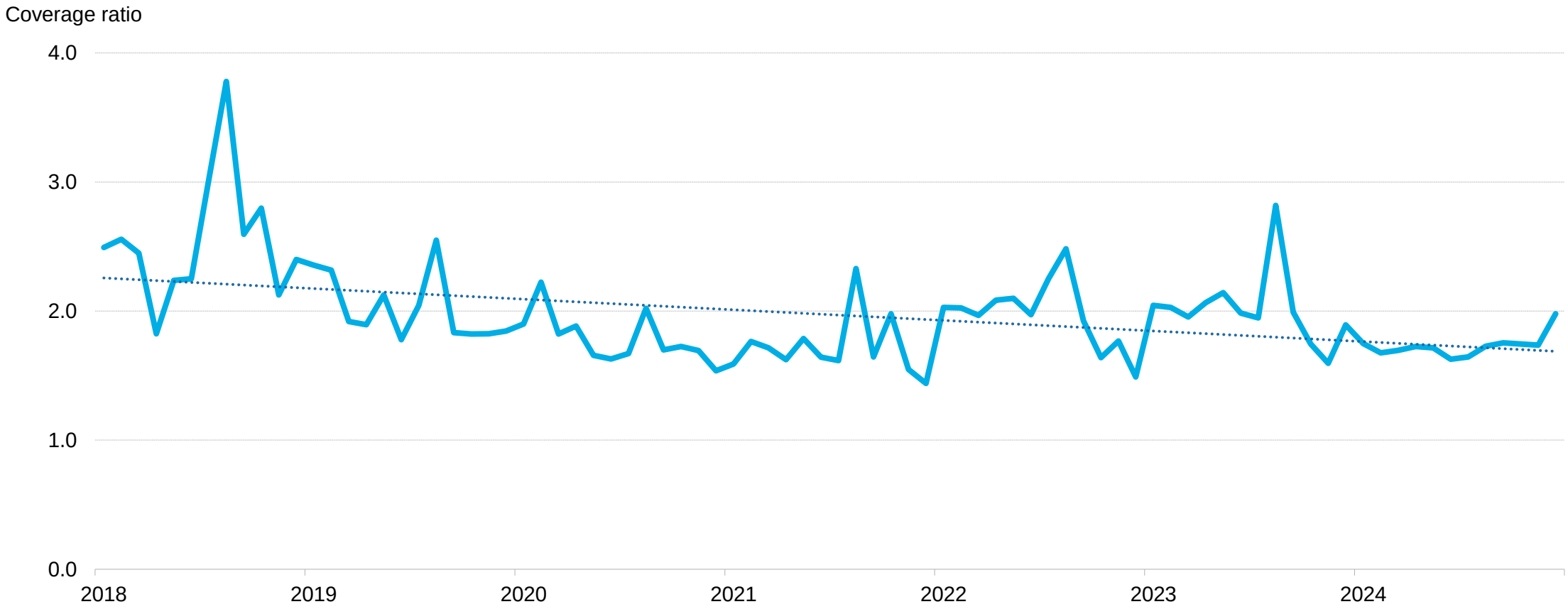
6.1.3 KPI: Monthly average auction participation



Source: EEX, BloombergNEF.

6. Market functioning

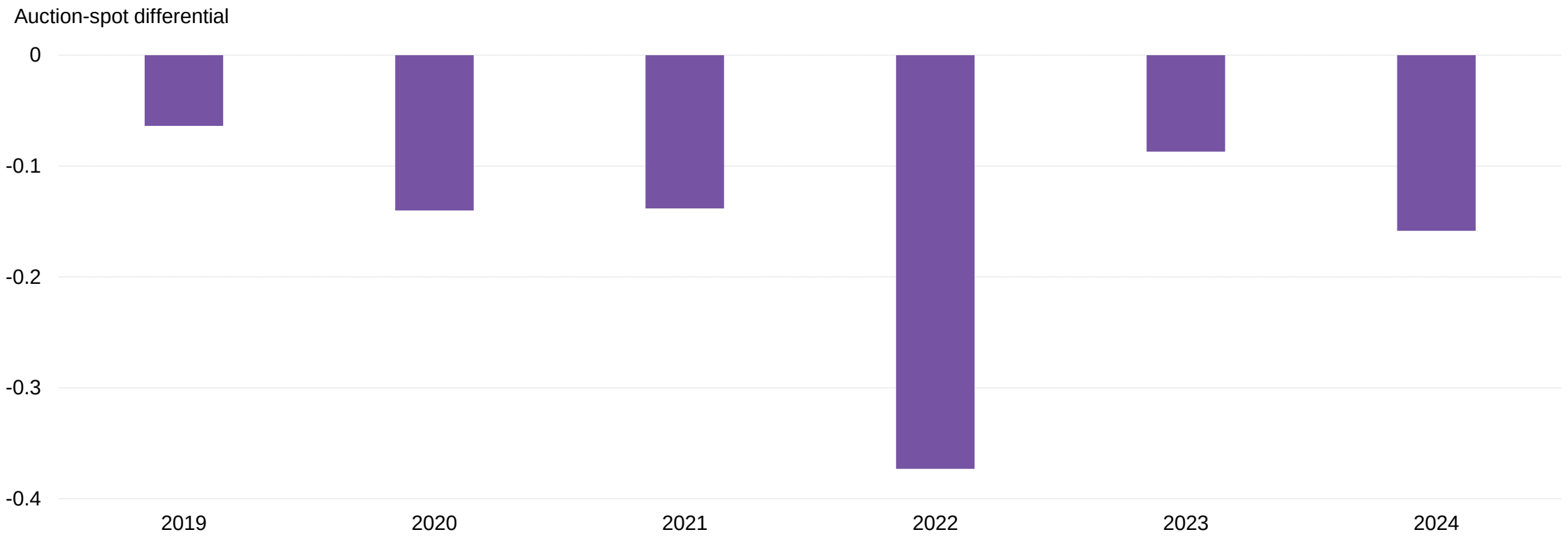
6.1.4 KPI: Auction coverage ratio



Source: BloombergNEF. Note: Coverage ratio is the total number of bids in an auction divided by the number of available EUAs.

6. Market functioning

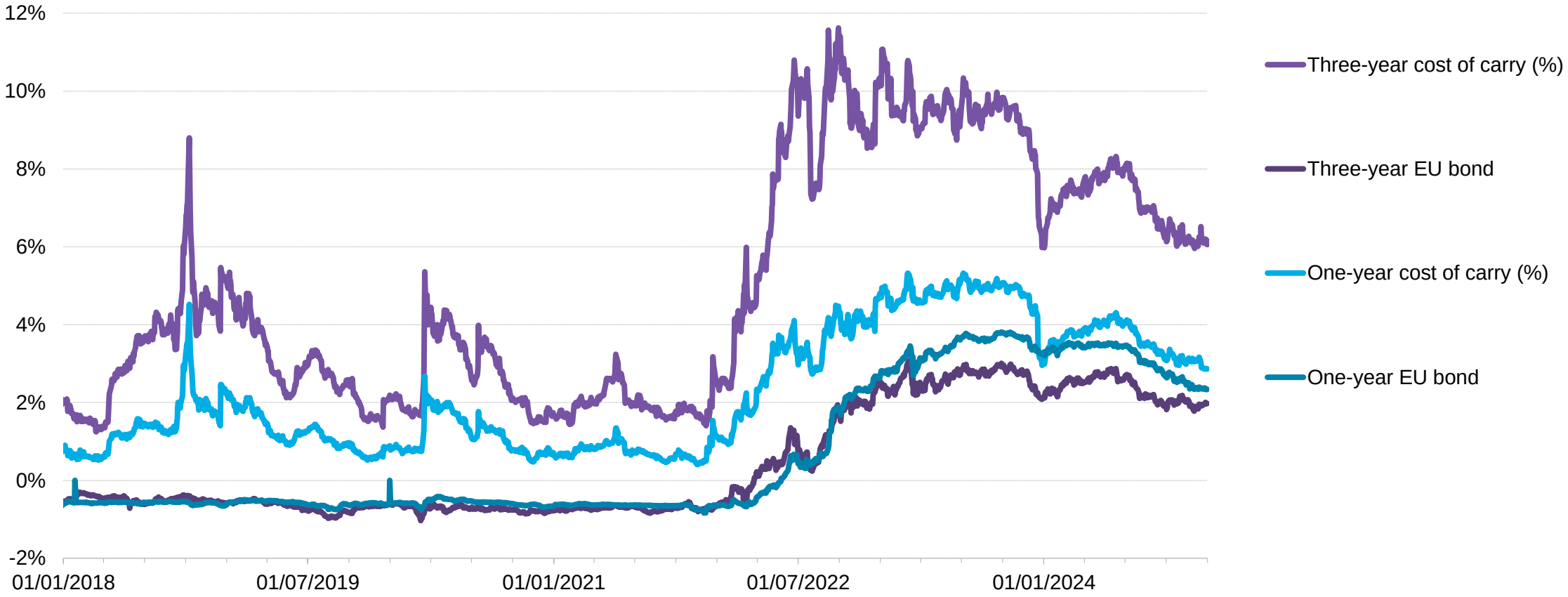
6.1.5 KPI: Annual average difference between auction and spot price



Source: EEX, BloombergNEF. Note: The auction-spot differential is the difference in the EUA price between auctions and on the secondary market.

6. Market functioning

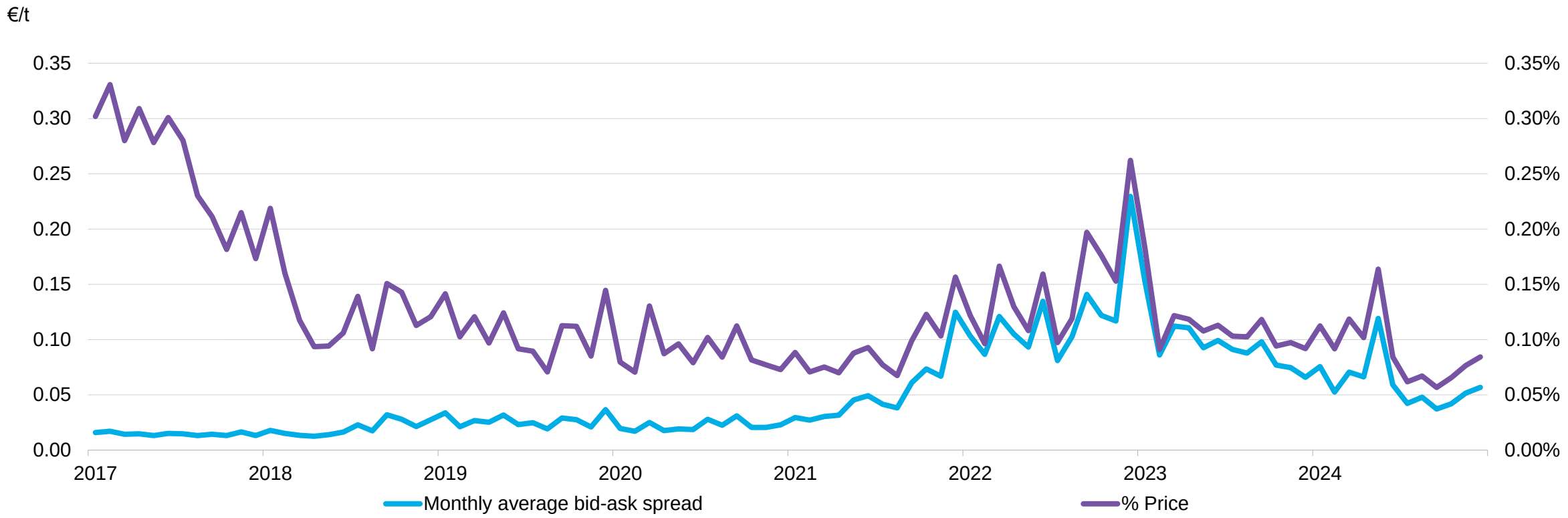
6.1.6 KPI: Cost of carry of EUAs versus AAA EU 3-year bond yields



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.

6. Market functioning

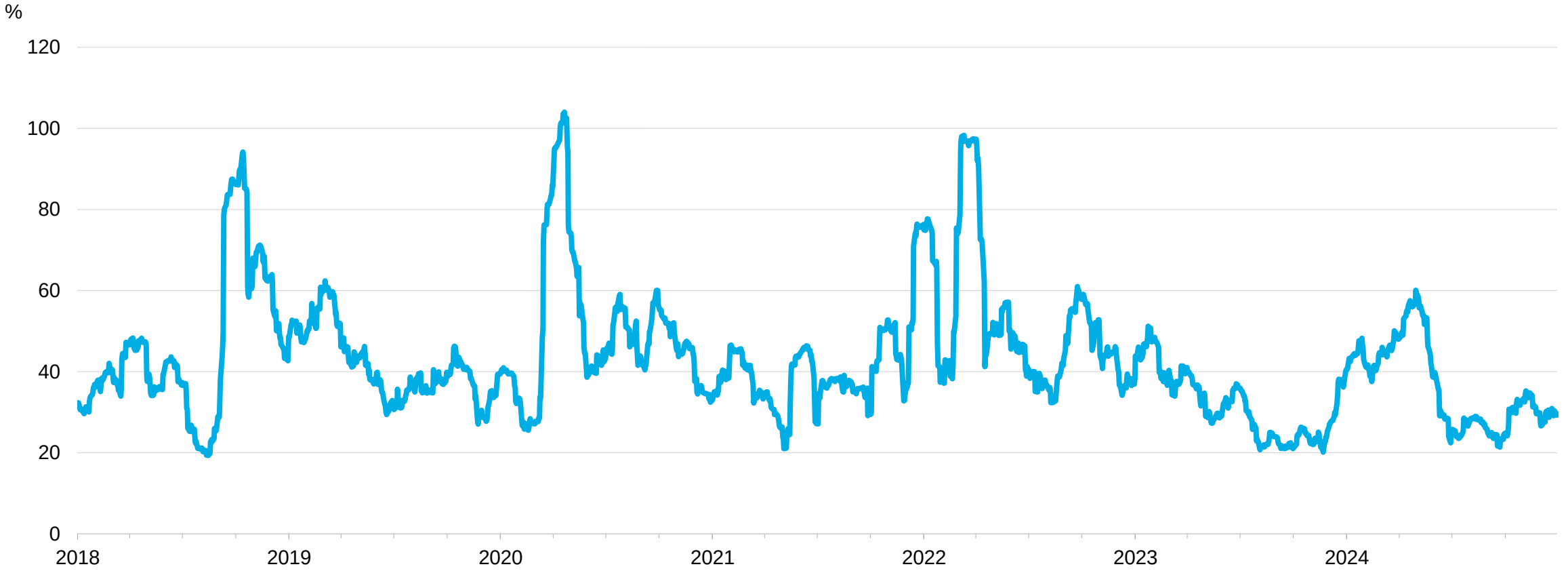
6.1.7 KPI: Monthly average ask-bid spread on ICE



Source: ICE, BloombergNEF. Note: ask-bid spread shows the difference between the lowest ask price and the highest bid price in the market at market close, in €/t and as a percentage of the closing price.

6. Market functioning

6.1.8 KPI: Volatility



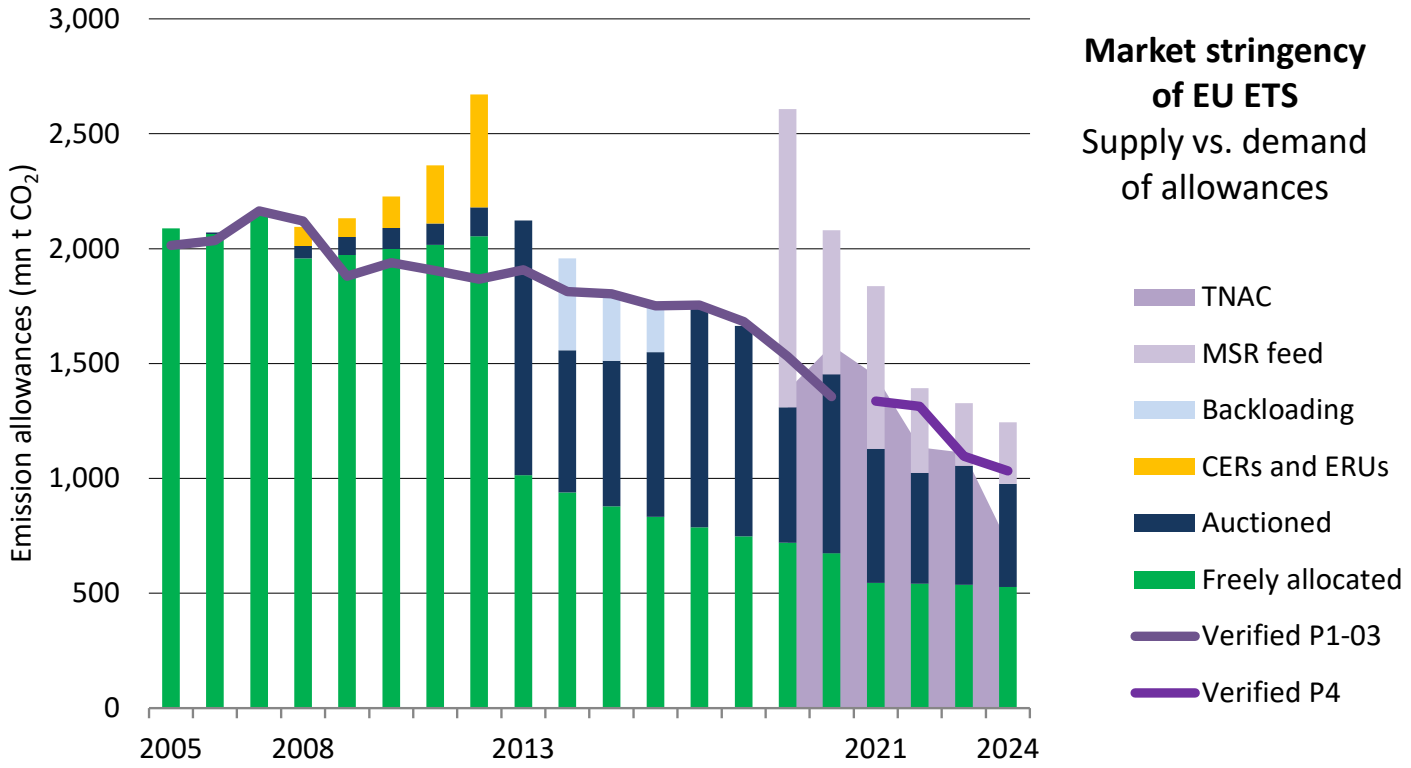
Source: ICE, BloombergNEF. Note: Volatility refers to the 30-day price volatility. It equals the annualized standard deviation of the relative price change for the 30 most recent trading days' closing price, expressed as a percentage.

6. Market functioning

6.2 KPI: Supply-demand balance and evolution of TNAC

- In 2019, the MSR mechanism started, mainly fed by the 900mt allowances of the backloading amount in 2014-2016.
- In 2023 and 2024, allowances in the MSR were cancelled by 2,515mt and 382mt, respectively.
- The most recent TNAC value, published in May 2024, amounted to 1.11 $GtCO_2$
- On 1 January 2024, 381,7 of allowances were invalidated under Article 1(5a) of the MSR Decision.
- The remaining holdings in the reserve amount to 400 million allowances

Figure 6.11: Supply and demand of EUAs and TNAC

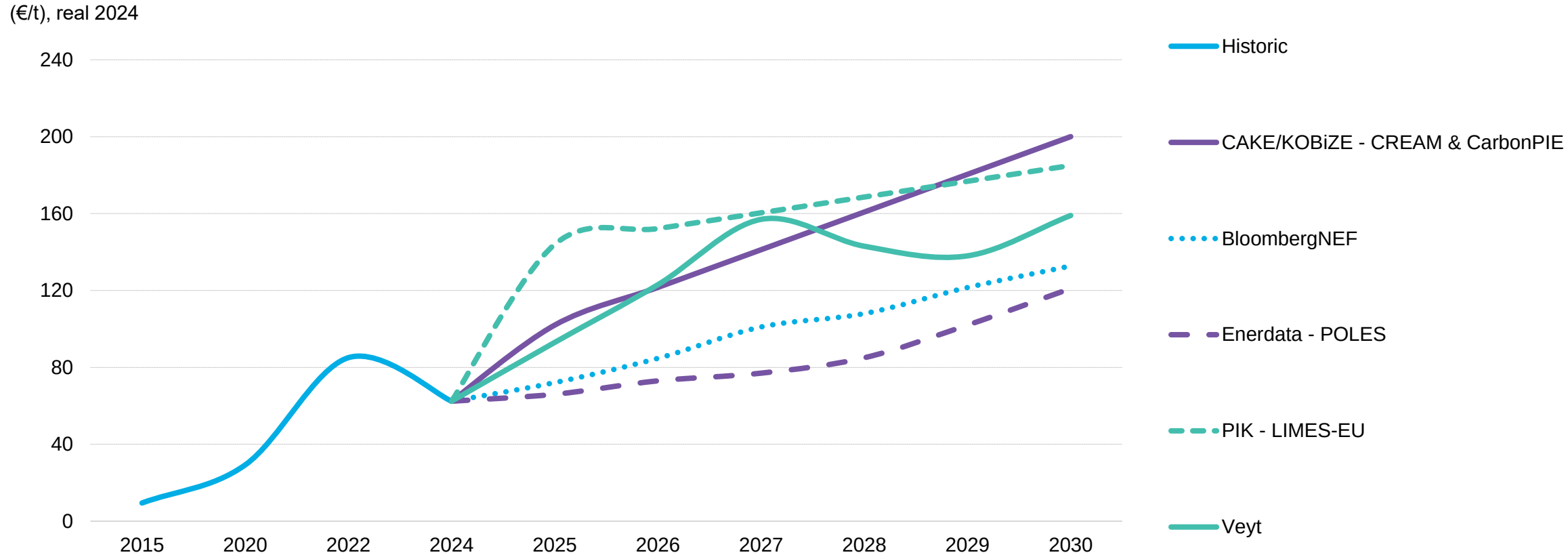


Source: Wegener Center based on EUTL (2024), EEA (2024), European Commission (2023).

TNAC expected value in August, once the transfer to the MSR will be made. The threshold will be probably reached in the middle of 2025

6. Market functioning

6.3 KPI: EUA Price forecasts

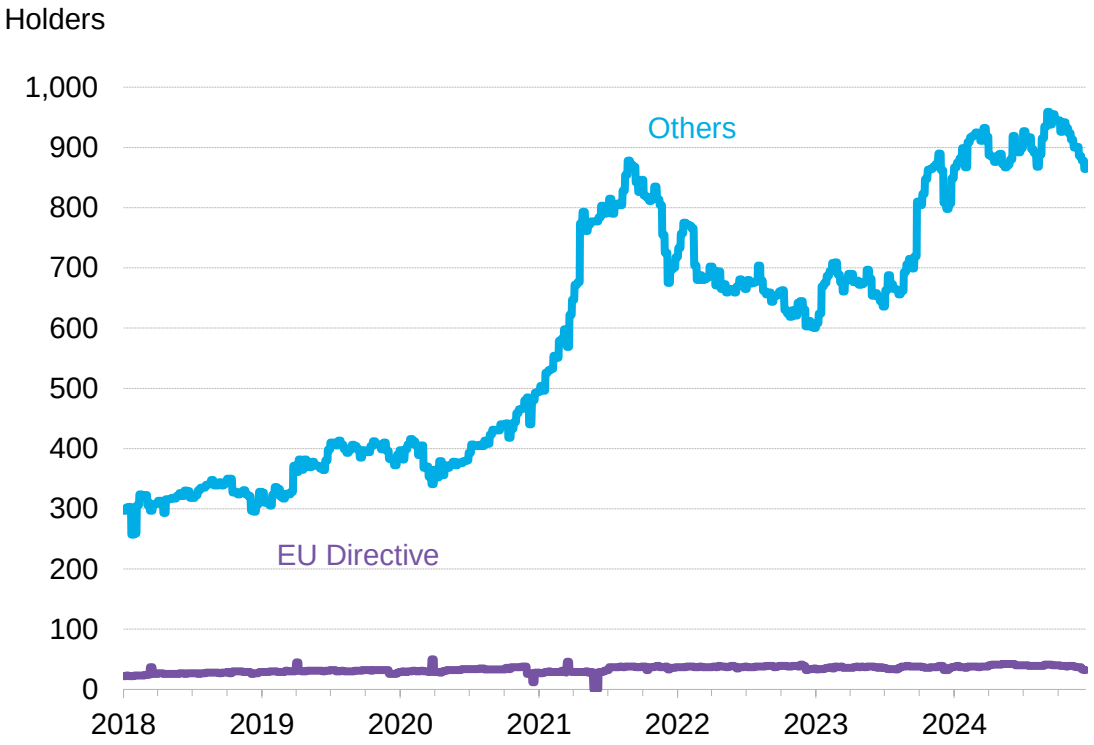


Source: BloombergNEF, CAKE/KOBiZE – CREAM & CarbonPIE, Enerdata, PIK, Veyt. Note: Prices are in real 2024 €/per metric ton.

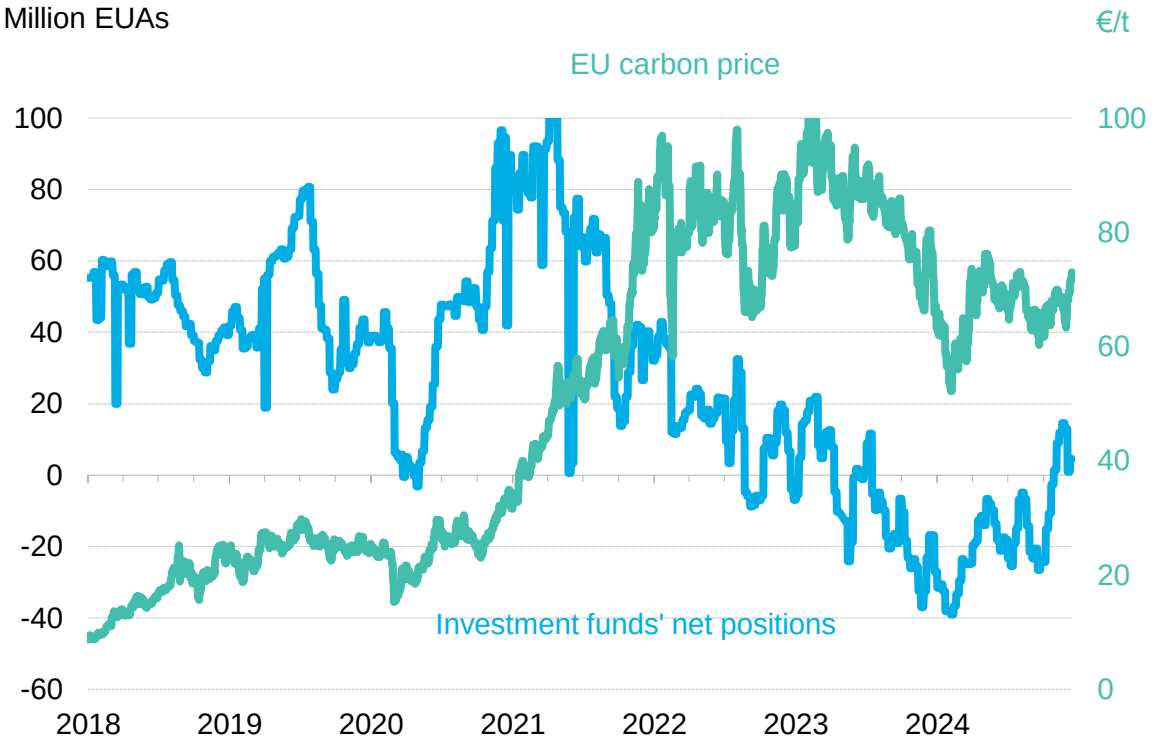
6. Market functioning

6.4 KPI: Market participation

KPI Net position holders



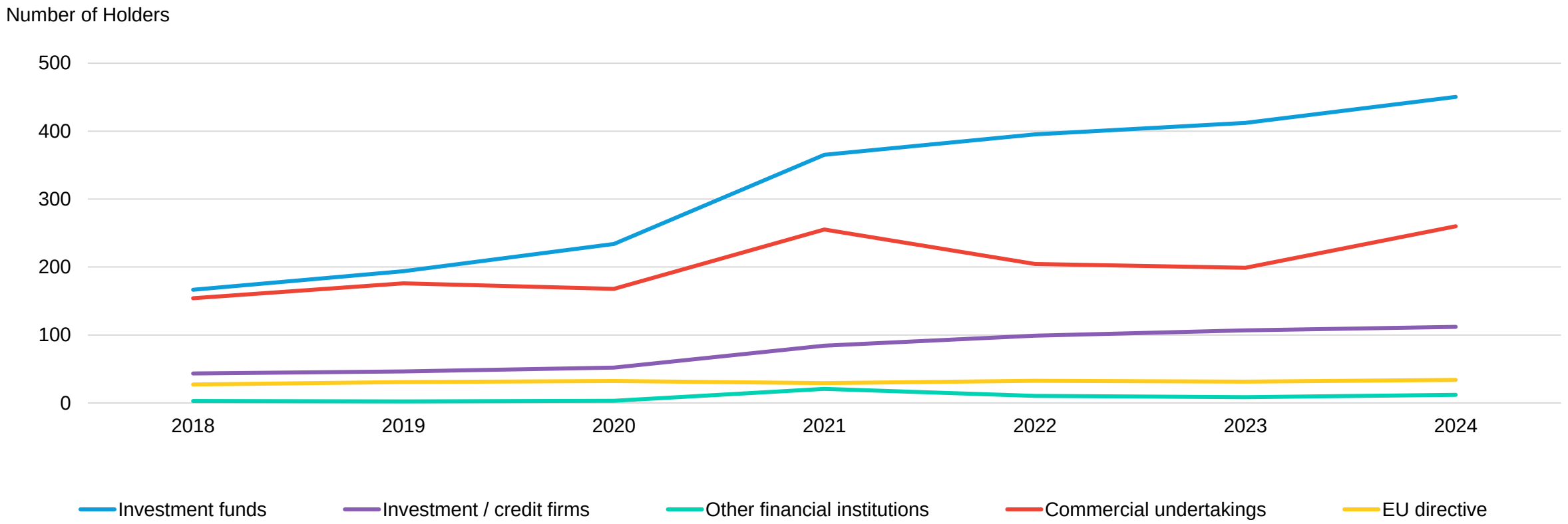
KPI Investment funds' net positions



Source: BloombergNEF

6. Market functioning

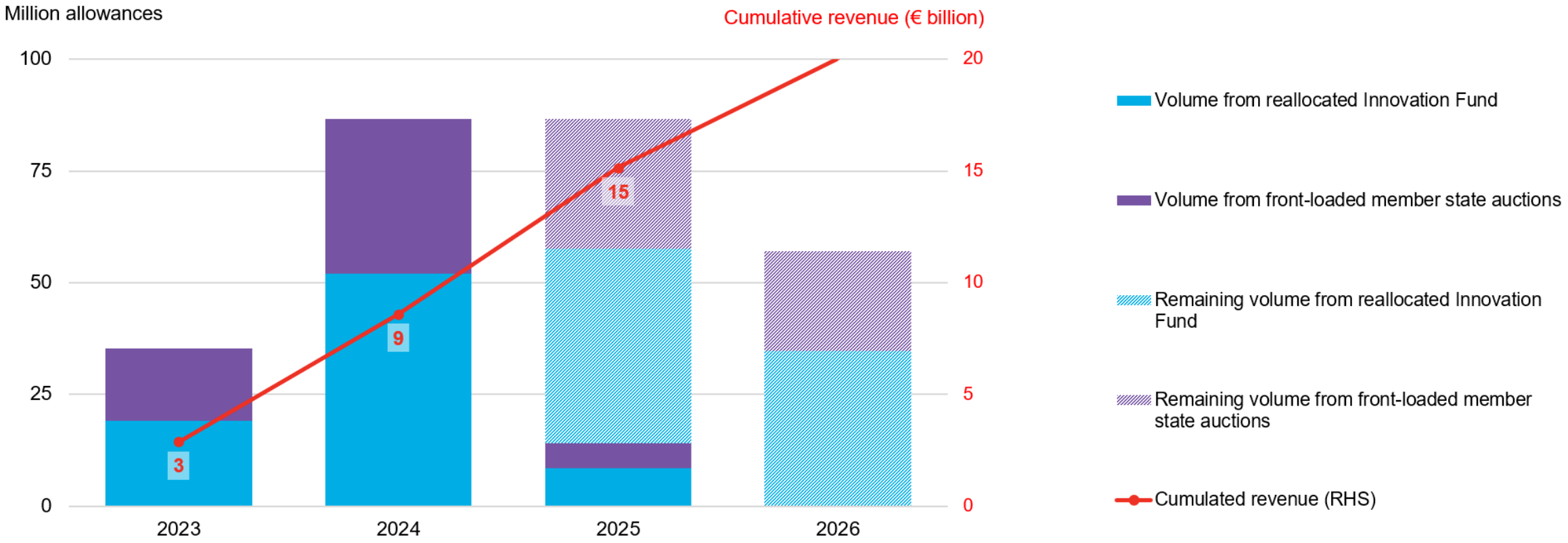
6.4 KPI: Number of EU emission allowance futures holders, by type of market participant



Source: BloombergNEF, Commitment of Traders Data (CoT)

6. Market functioning

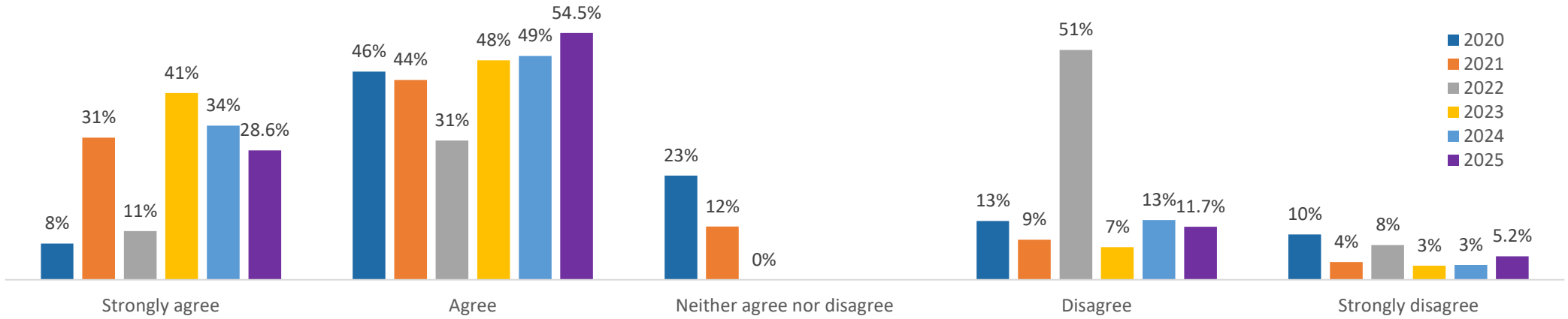
6.5 KPI: Other EU policies impacting carbon: REPowerEU volumes and revenue status



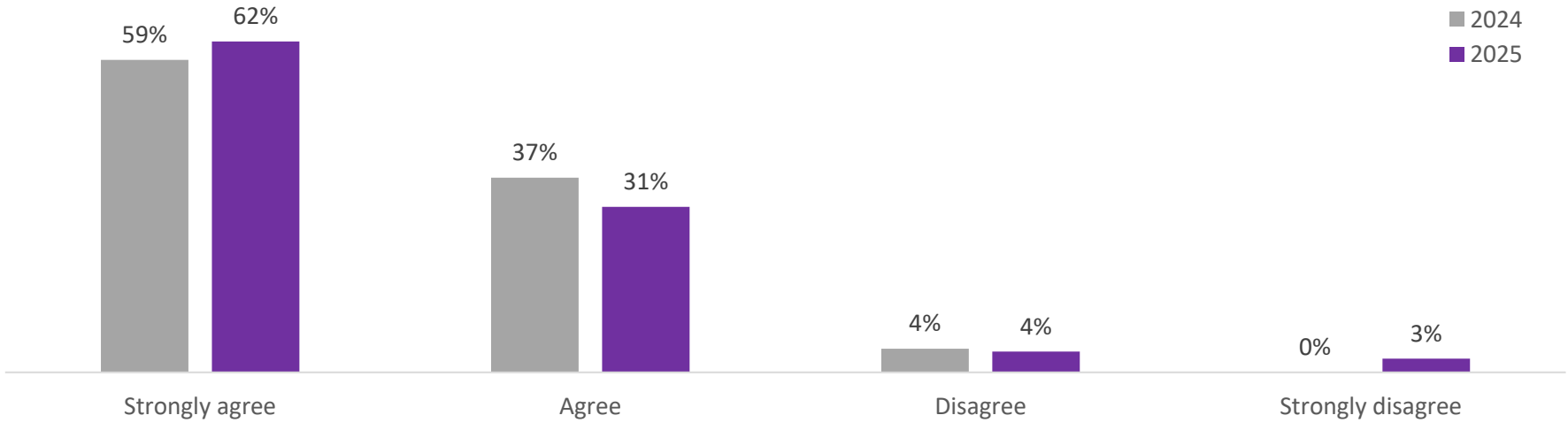
Source: European Commission. BloombergNEF. Note: European Commission carbon price forecast underpins calculations.

7. Market Sentiment Survey

1. The EU ETS in its current form is providing signals for decarbonisation to 2030.

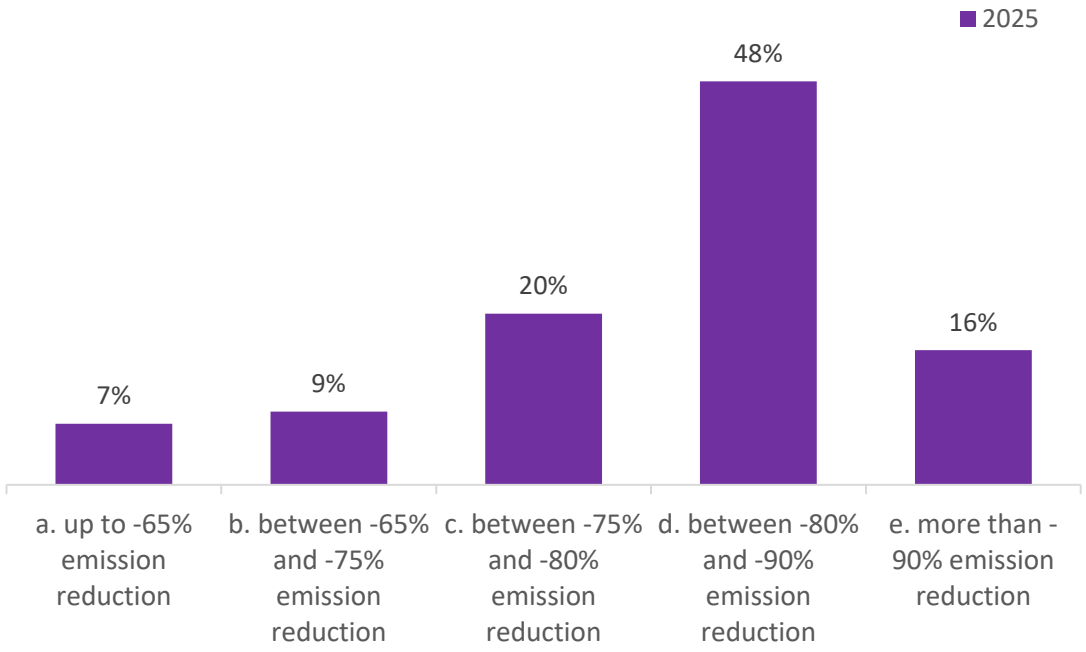


2. There is a need to examine what will drive decarbonisation of EU ETS sectors post 2030.

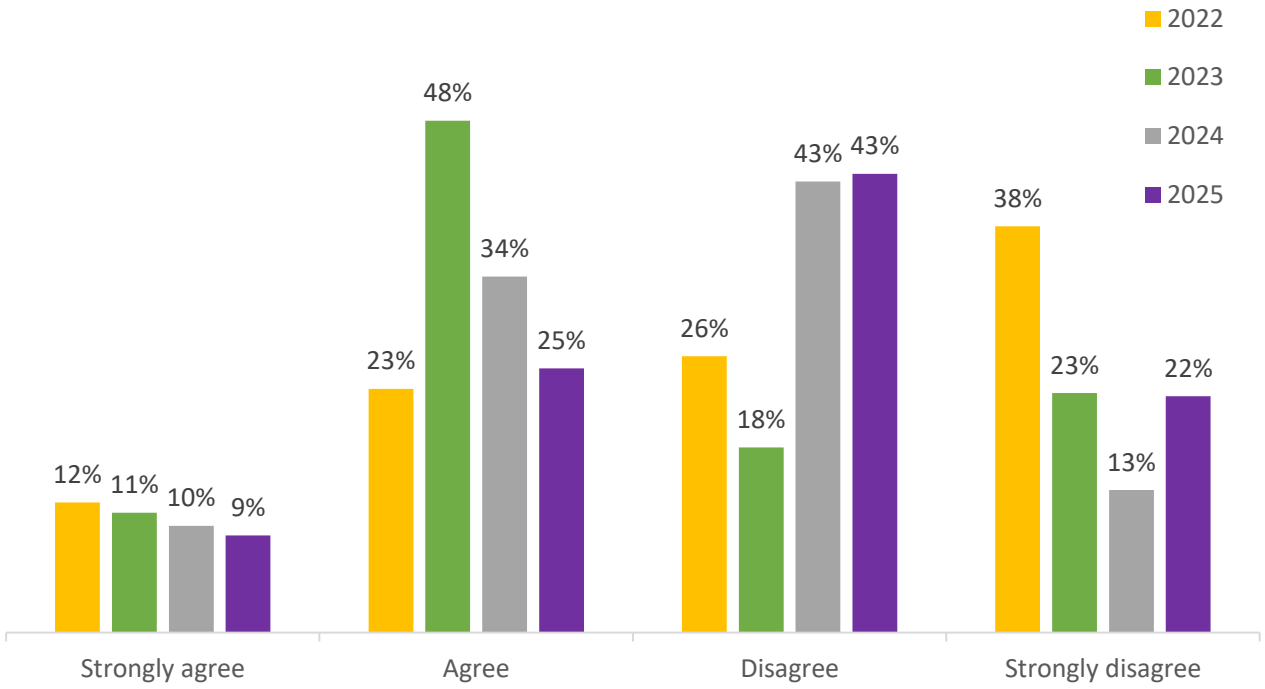


7. Market Sentiment Survey

3. At what level of decarbonisation should the EU set its 2040 target?

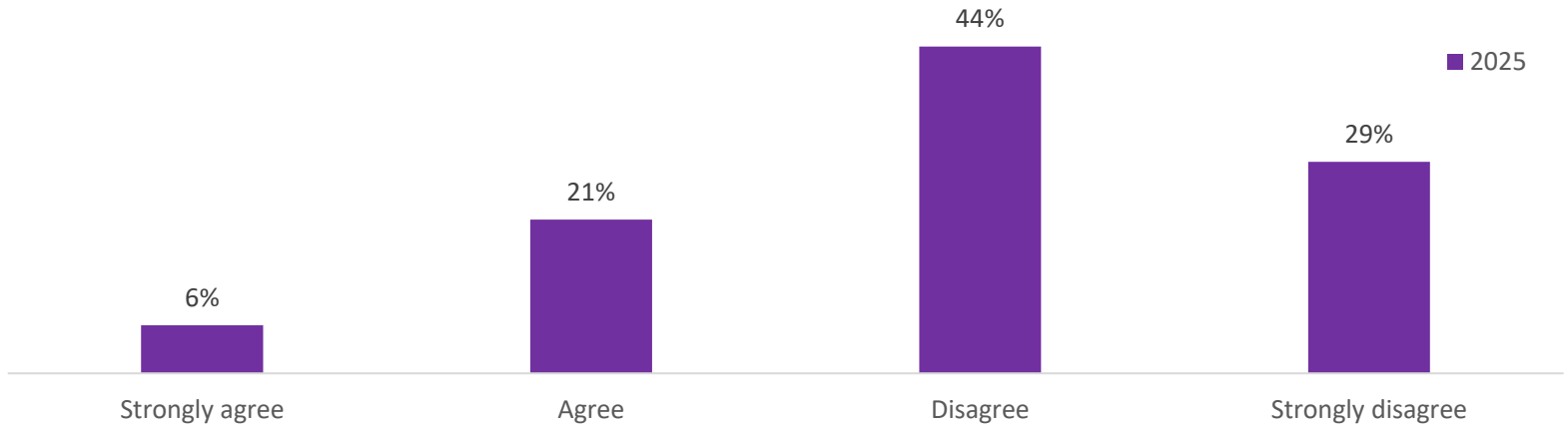


4. The combination of EU ETS and current CBAM for the EU will adequately address competitiveness and carbon leakage concerns for the EU industry.

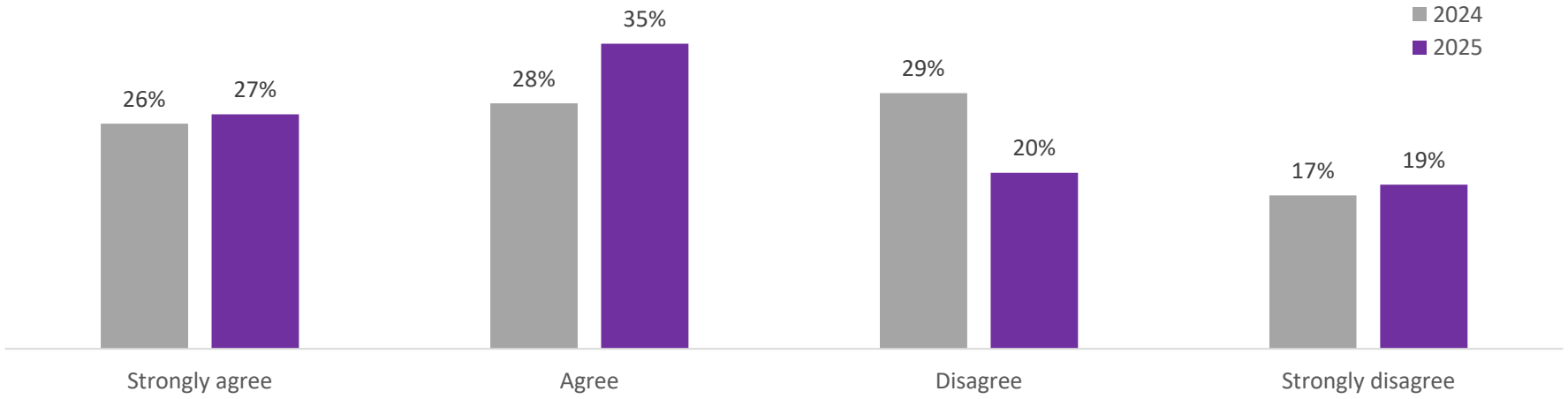


7. Market Sentiment Survey

5. The CBAM should be delayed until significant issues are addressed

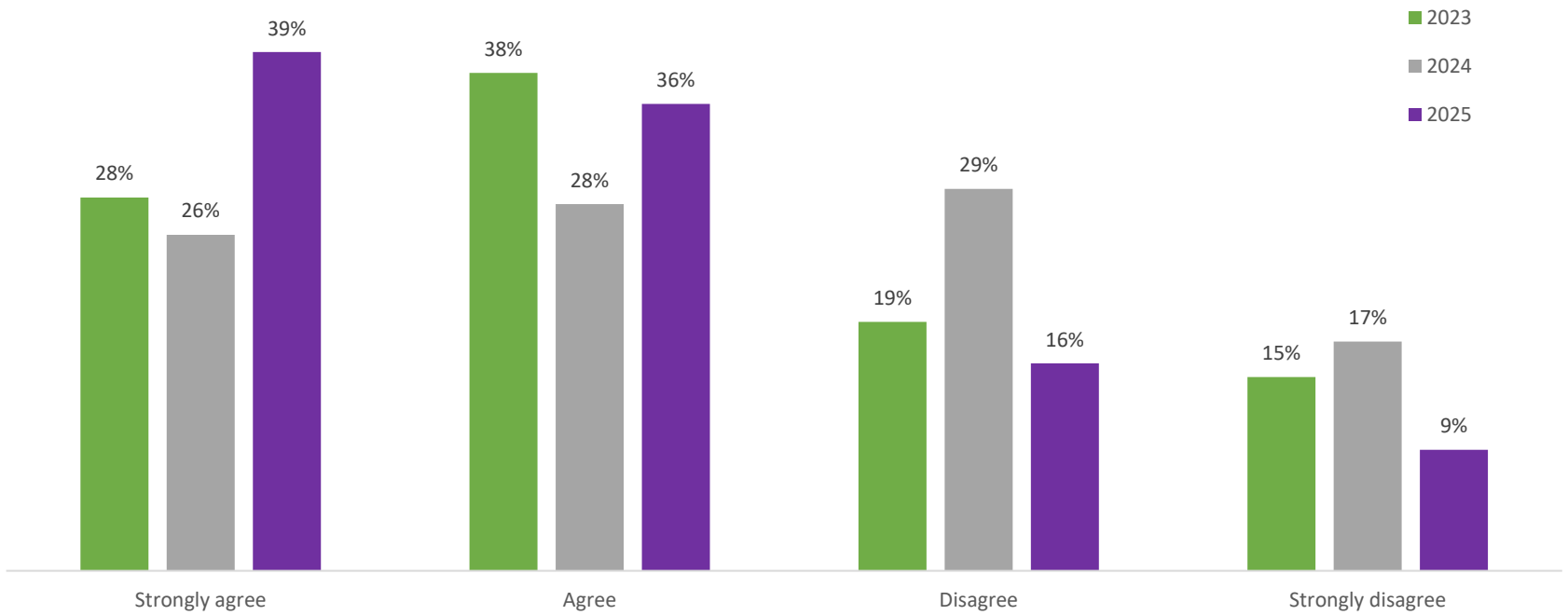


6. To reach the goals of the Climate Law, an international link through international credits is important.



7. Market Sentiment Survey

7. Early integration of removals in EU regulation, including in the EU ETS Phase IV, is critical to reach EU Climate objectives.



8. Looking forward

Policy	Market Stability Reserve (MSR)
Details	**Q1 2025:** Commission to review (Art 3 MSR Decision): • The **intake rate %** for the number of EUAs to be placed in the reserve (Art. 1(5) of the MSR Decision). • The value of the **threshold**. • The number of **EUAs to be released** from the reserve (Art 1(6) or (7) of the MSR Decision). • The impact on growth, jobs, and the EU's industrial competitiveness and on the risk of carbon leakage.
Impact?	A more stringent intake rate % could increase the speed of reduction of the TNAC supply. A shorter TNAC could have a bullish impact on carbon prices. The impact would be more stringent if the invalidation rule remains.
Policy	Carbon Border Adjustment Mechanism (CBAM)
Details	• **Q1 2025:** Commission to simplify the CBAM. • **Q3 2025**: Commission to review the CBAM, assessing the feasibility of extending to downstream sectors and indirect emissions, how to support exporters of CBAM products, and how to tackle circumvention risks. • **Q4 2025:** Commission to review CBAM's **impact on least-developed countries**. • **Q1 2026:** Commission to submit a legislative proposal on an extension of CBAM. • **Q4 2027:** Commission to review, evaluating progress in international climate negotiations. • **Q1 2028:** Commission must report on **CBAM's impact on carbon leakage, including exports**, every 2 years.
Impact?	CBAM simplification could reduce administrative cost. CBAM expansion to new sectors could accelerate the phase out of free allocations for sectors not currently covered by CBAM, thus increasing demand for EUAs from these sectors, and increasing prices.

8. Looking forward

Policy	Permanent, and non-permanent removals (CCU)
Details	**By July 31, 2026:** • Commission to publish a report on integrating **negative emissions** (including but not limited to BECCS and DACCS), **into the ETS1**. • Commission to review also whether double counting is avoided, and to assess ways to account for emissions that have been captured and utilised in a product but risk entering the atmosphere during or after normal use.
Impact?	If negative emissions are included in the EU ETS, in the long term, the increased supply of EUAs/CDRs could counterbalance the expected price increase of EUAs from a stricter cap.

Policy	Municipal Waste Installations (MWI)
Details	**By July 31, 2026:** Commission to release a **report** and if positive, legislation for the **inclusion of MWI into the ETS** by 2028. • **Q1 2028:** Emissions from **MWI installations** would be included **in ETS1**. • **Q1 2030:** Until 2030, Member States will have the possibility to opt out MWI from the ETS1 (Art 30 (7)).
Policy	Aviation
Details	• **2025 - 2026:** Flights within the EEA area will lose 50% of free allowances, with a **phased out by 2026**. • **By July 31, 2026:** The Commission **reviews CORSIA.** • **Q1 2027:** Possible inclusion of **flights** between the EEA and non-EEA airports into ETS1 in case CORSIA does not deliver.
Impact?	The inclusion of new sectors in EU ETS should increase the cap and bring additional supply of EUA.

8. Looking forward

Policy	Maritime transport
Details	• **2027 - 2028:** To include **offshore ships exceeding 5,000 gross** tonnage and potentially incorporate smaller offshore ships. • **Q1 2028:** Shipping 100% emissions on journeys between **EU and non-EU ports** if the IMO mechanisms is not ambitious.
Impact?	The extension of ships covered by the system should increase the demand of EUAs and bring market pressures, thus increasing prices. If additional trips covered, this trend could accentuate.
Policy	International Linking
Details	**Q2 2026:** Commission to review the possibility of **linkages between the EU ETS** and other carbon markets.
Impact?	Following the Swiss example, international linking will increase number of participants in EU ETS, increasing market size, trading and liquidity.
Policy	ETS for Road transport, buildings and other sectors not covered by ETS1 (ETS2)
Details	**By July 15, 2026**: • Commission to decide whether to include **installations below 20MW** total rated thermal input (Annex I) in ETS1. If not, they will join ETS2. • Commission to decide if **ETS2 will kick off in 2028** or **2027** (based on energy prices). • **Q1 2027:** ETS2 to commence. • **Q2 2027:** Commission to **review the ETS2**, evaluating its effectiveness, administration, and practical application. • **Q1 2028:** ETS2 commences if decision in 2026 to postpone one year later. • **Before 2031**: Commission to decide if EU ETS1 and ETS2 should be merged.
Impact?	Inclusion of ETS2 in ETS1 could increase market size, reduce transaction cost and increase supply.

8. Looking forward

Policy	Benchmark update
Details	**Before 2026:** Implementing Act updating, for the period 2026-2030, the benchmark values on the basis of 2021 and 2022 data, applying the annual reduction rate between 2008 and 2028 [Art 10a (2) (c) of the EU ETS Directive].
Impact?	More stringent benchmarks will reduce the amount of free allocation to compliant entities. By extension, it will increase the demand of EUAs to cover emissions, thus increasing carbon prices.

Policy	Industrial Decarbonisation Bank
Details	**June 2026:** EC legislative proposal aiming EUR 100 Billion funding to support industrial decarbonisation. • **Existing** Innovation Fund: 20 billion (starting from 2025) • 10% of Member States EUAs Auctioned in 2028-2037: **EUR 33 Billion**. • InvestEU: 2.5 billion (leverage factor of 10 to make total leveraged amount EUR 33 Billion).
Impact?	On Innovation Fund share, no indication that additional EUAs will be sold in the market, thus no expected impact. For auctioning share impacts, it will depend on the distribution of EUAs across periods (i.e. frontloading in REPower EU), otherwise no direct impact on EUA supply. An indirect impact could happen. If successful, the Bank could accelerate emission reduction in EU industry, leading to a lesser demand of EUAs. Still uncertainties remain until legislative proposal.

Take Aways

- The **2024 EU ETS context** is shaped by a volatile economic and political landscape. 2024 saw the launch of the Draghi Report, and the Clean Industrial Deal, placing carbon pricing at the heart of efforts to **address competitiveness**.
- Some uneasiness resurfaced with regards to **regulatory interventions**, as illustrated by the announcement of the **Industrial Decarbonisation Bank**, which is partly funded by EU ETS revenues, lacking in **transparency** and **predictability**.
- The EU ETS, like many of the EU climate change policies are facing **uncertainty** related to upcoming reviews as well as the impact of the delay in the 2040 target.
- The EU ETS cut emissions by **4.8% emissions** in **2024**, with over 50% of the 62% Phase 4 target (2030) already met, led mostly by the power sector and its shift towards renewable energy sources. Yet, industrial reductions partly stem from **lower production output**.
- EU ETS auction revenues reached **€32 billion** for **Member States** in 2023, a 9.8% increase from 2022. MS revenues made up 76% of the total EU ETS revenue generated in 2023.
- The 2025 Market Sentiment Survey reveals that despite 73% opposing the delay of introducing CBAM, 66% doubt that the CBAM can fully address carbon leakage and competitiveness, without **further refinements**. Support for integrating **carbon removals** into the EU ETS before 2030 grew to **75%** in **2025**. COP29's Article 6 progress spurred 61% of respondents to favour international credit linkages, signalling a shift toward broader carbon market strategies.
- From a market functioning point of view, with **9.7 billion EUAs traded** and a stable auction coverage ratio of 1.73, the EU ETS market functioned effectively in 2024. Though **open interest fell 19%** due to weaker demand from utilities, indicating a need to monitor liquidity trends.
- This makes the question of looking to the **future of the EU ETS** an important one for 2025 and 2026 for policy makers and stakeholders.