A CLEAN INDUSTRIAL REVOLUTION IN EUROPE

How the EU carbon market can accelerate decarbonisation by making polluters pay

February 2025

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1 Safeguarding the climate and competitiveness

Executive summary

We have very little time to stop the climate crisis from turning into a climate catastrophe, which would have severe consequences for the economy and for society.

For instance, the European Commission estimates that climate-related extreme events increased between 1980 and 2022, causing 220,000 deaths and €650 billion in economic losses over that period in the EU, of which about €179 billion were in the last five years. Without timely intervention, such impacts are set to intensify.

Embracing rapid and effective decarbonisation represents an opportunity for EU industry to remain competitive globally and futureproof itself against climate risks, while ensuring that the EU reaches its climate targets. This means that inaction or hitting 'pause' is no longer an option, both for the sake of the climate and the economy.

The European Commission's strategy for a new industrial policy focuses on how to financially support both the decarbonisation of energy-intensive industries and how to scale up green technologies (such as electrolysers for renewable hydrogen production and heat pumps) in Europe. With the EU debating its 2040 climate target and an upcoming Clean Industrial Deal, now is the right time to look closely at the highly polluting sectors under the EU Emissions Trading System (ETS), such as steel, cement and chemicals. To facilitate informed decision-making, it is important to assess the climate performance of companies in these sectors and how much state support they have received in recent years through both EU ETS free allowances and the Innovation Fund. This report sets out to provide this analysis.

Paying polluters

Our investigation found out that enforcing the 'polluter pays' principle remains a pipe dream: around 40 billion euros were lost to free allowances in 2023 alone, instead of being invested in the urgently needed decarbonisation of ETS sectors.

Sectors such as steel, cement, and chemicals still received free allowances representing more tonnes of carbon dioxide than they actually emitted in 2023. Once again, a handful of companies make up the lion's share of emissions in both the steel and cement sectors. For instance, ArcelorMittal and ThyssenKrupp were responsible for around half of the EU steel sector emissions in 2023. This disparity results in huge variations in free allowances received. The worst performers were steel behemoth ArcelorMittal, which received over €3.8 billion in free allowances in 2023, and the cement giant Heidelberg, which received almost €2 billion.

These figures demonstrate that the current architecture of the EU ETS continues to reward heavy polluters by granting them free allowances instead of incentivising emissions reductions. This includes fossil fuel companies. For example, even though oil refining is one of the most polluting activities in the EU, it still received over 73 million free allowances in 2023, worth around €6 billion, enabling the sector to pollute at no cost to itself but at significant cost to the climate and society.

While initially set up to shield the EU from the risk of industrial conglomerates from relocating due to climate rules, this system has let heavily emitting companies off the hook for decades: while the energy sector has almost halved its CO_2 emissions since 2013, the manufacturing industry only decreased its carbon pollution by less than 15% (and even less from sectors such as oil refining or cement).

Meanwhile, both a strong carbon price, and implementation of the Carbon Border Adjustment Mechanism (CBAM) as it was originally conceived, are key parameters to increase the budget of the Innovation Fund. Delaying CBAM by two years, as some are now proposing, would deprive the Innovation Fund of about €20 billion of much-needed resources. For the year 2030 alone, around €9 billion would be lost to free allowances instead of being invested into industrial transformation.

To date, the Innovation Fund has mostly financed carbon capture and storage (CCS) and carbon capture and utilisation (CCU) projects, which should not be prioritised over technologies that directly reduce emissions, and instead only be used to tackle residual industrial emissions in targeted sectors, such as cement and lime. In fact, the analysis suggests that out of €6.4 billion (the total budget of the Innovation Fund from 2020-2022), more than €2.5 billion went directly into financing CCS and CCU projects.

Cement and chemicals were the top two sectors benefiting from the Innovation Fund. In fact, the cement sector received nearly €2 billion in grants (for the period 2020-2022), and was promised half a billion euros in grants for the year 2023.

End free allowances

Our analysis makes clear that heavy industry continued to receive billions of euros to pollute in 2023. The rational approach would be to stop this now by phasing out free allowances and using the additional revenue to support investment in industrial decarbonisation (for example, through the Innovation Fund). True competitiveness of EU industry lies in rapid decarbonisation, closing the innovation gap and scaling up green technologies, not in giving heavy industries a licence to pollute with impunity. Meanwhile, it is clear that substantial investments are needed to support the decarbonisation efforts of energy-intensive industries in Europe. A larger Innovation Fund could support some of these investments in clean technologies. To enable this, carbon pricing instruments such as the ETS and CBAM will need to be properly implemented and strengthened over time. Given the significant value of the Innovation Fund, it must be ensured that its total budget is also spent on green solutions such as the uptake of clean energy and energy savings rather than massively allocated to CCS/CCU projects. Finally, given the amount of financial support received by energy intensive industries through the ETS, any new financial support directed towards these sectors must come with strict conditions to invest in decarbonisation and quality jobs.

Policy RECOMMENDATIONS

To address the flaws in the current system discussed above, EU policy-makers should:

1 Stop free emissions allowances from undermining industrial decarbonisation

- End free allocation of allowances for all sectors as soon as possible and by 2030 at the latest
- During the phase out period, only give free allowances to companies that demonstrate significant improvements in energy efficiency and a clear commitment to bringing down their carbon footprint in line with EU climate goals and the Paris Agreement
- Increase the share of allowances allocated to the Innovation Fund

2 Support effective climate policies and industry transformation through a better targeted Innovation Fund

- Include a mandatory criterion on raw material savings
- Prioritise scalable production technologies with zero direct emissions

3 Implement a well-functioning and robust Carbon Border Adjustment Mechanism (CBAM) to push climate-friendly technologies

- Start implementation in 2026, with the current phase-in factors or higher
- Broaden the scope of the sectors covered, starting with bulk chemicals, including refined fossil fuels
- Include indirect emissions for all products

4 Ensure any additional financial support to ETS sectors comes with binding climate and social conditions

- Additional public financial support must be conditional on the achievement of clear decarbonisation goals
- Public funding aimed at industrial transformation must be linked to maintaining or creating quality jobs and upholding workers' rights

Introduction

Heavy industry is at the heart of the manufacturing system and plays a vital role in supplying the goods we need and providing jobs for EU citizens. It can also influence the social and cultural identity of its workers and host communities.

However, heavily polluting industrial sectors also have significant harmful effects on the climate, the environment and public health. While the profits made by industry are private, the massive costs of this pollution are borne by society as a whole. In the EU, the costs to health and the environment of industrial air pollution amount to €268 and €428 billion a year, according to the European Environment Agency in recent years.

Minimising these external costs while maximising the European Union's long-term prosperity, sustainability and wellbeing requires every sector of the economy to become cleaner, more competitive and resilient to the disruptive and destructive power of climate change.

For steel, cement, chemicals and other energy-intensive sectors, this requires a green industrial transformation that centres on innovation and decarbonisation, a fair deal for workers and respect for our planet's ecological boundaries.

The distress signals from European industry started long before EU institutions made it a top priority within their portfolios, and had little to do with climate action. Many heavy industrial sectors saw production decrease in recent years due to growing inflation, cheaper imports from countries with lower wages and laxer social and environmental protections, all made worse by the energy price spikes following the war in Ukraine.

Despite the dominant narrative of an industrial sector left to wither, energy-intensive industrial sectors and companies have been the recipients of generous state largesse - often without any real strings attached.

Faced with the threat that companies would relocate to other parts of the world and with protests by workers who have lost or are at risk of losing their jobs and with the fears of vulnerable communities that such departures would tear at their economic fabric, many governments have provided a steady stream of state aid[1] to energy-intensive industrial sectors. They have also provided abundant exemptions in the form of forgone fees or levies, including free allowances under the EU's Emissions Trading System and have allocated significant investment to such industries from EU ETS revenue.

However, all this public generosity has led to little in the way of decarbonisation and emissions reductions from top polluters. Compared to 2013, the cement industry reduced carbon footprint by only 12%, the steel industry managed less than 20% (mostly due to a combination of efficiency gains and reduced output), while the oil refining industry has barely shown any progress, with emissions falling by less than 10%.

This must change. Rapid emissions reductions in energy-intensive industries are needed before 2030 if we want to reach our climate targets on time, but our current policies have proved to be a grossly inefficient use of public resources.

1 List of state aid decisions by NACE sector C.

THE FREE ALLOCATION SYSTEM

Free emission allowances are the key mechanism used to shield heavy industry from the supposed risk of carbon leakage, meaning a situation in which companies transfer production to countries with weaker climate policies in order to lower their costs.

Up until 2021, approximately €200 billion worth of allowances were handed out at no cost to heavy industry. Although the default rule in phase 4 of the EU ETS (2021-2030) is that companies are meant to pay for their pollution via an auction system, this remains the exception. More than 90% of industrial emissions are covered by free allowances. According to the European Commission, the value of these freely allocated allowances amounted to about €42 billion every year up to 2025. The full elimination of free allocation for sectors that will be covered by the CBAM is planned for 2034, while the phase out for sectors that do not fall under the scope of CBAM has yet to be determined.

For more information, check out 'EU ETS 101'.

INDIRECT COST COMPENSATION

EU member states can compensate electricity-intensive industries for costs arising from using electricity and heat that, under the current ETS, are subject to the full carbon price. This is a form of state aid that can be funded through EU ETS revenues. In 2023, 15 national governments disbursed indirect cost compensation subsidies totalling €3.95 billion. Germany alone paid energy-intensive industries €1.6 billion in 2023 to cover their indirect energy costs.

EU ETS REVENUES

In 2023, the EU decided that all future ETS revenue would be invested for climate-related purposes. That same year, total revenue amounted to €43.6 billion. Currently, some three-quarters of revenue goes to member states, around 12% to the Modernisation Fund and only about 5% to the Innovation Fund. The remaining 8% goes to the Recovery and Resilience Facility under the REPowerEU Regulation, which was set up to respond to the energy crisis caused by the war in Ukraine.

Competing for attention

The European Commission's proposed Clean Industrial Deal (due out on 26 February 2025) concludes an intensive, industry-led process that started after the energy price spikes in 2022 and 2023, and intensified in the run up to the EU elections.

In early 2024, representatives from 17 sectors, mostly coming from energy intensive and fossil fuels industries, signed up to the Antwerp declaration. Together, they called for a 'European Industrial Deal' that would focus on competitiveness as a strategic priority, underpinned by deregulation and more public funds for industry.

Since then, industry and its competitiveness has become a topic of intense debate among political leaders and other stakeholders in Brussels and in national capitals. As a result, in her speech for her re-election as European Commission President, Ursula von der Leyen stated that a new Clean Industrial Deal (CID) would be released within her first hundred days in office.

The CID builds upon the recommendations of the report on the future of competitiveness by Mario Draghi, the former Italian prime minister and former president of the European Central Bank, The Clean Industrial Deal tackles one key element, now taken for granted: the lack of investments in industrial transformation. In his report, Draghi calls for Europe's ambitious climate targets to be matched by a coherent plan to achieve them and turn decarbonisation into a competitive opportunity for Europe.

Draghi's report also identifies the four most energy-intensive industries: chemicals, metals (steel and aluminum), non-metallic minerals (cement, ceramics, glass and lime), pulp and paper products. Together, these sectors represented 16% of total manufacturing gross value added until 2021, accounted for 13% of jobs in manufacturing and were responsible for 68% of GHG emissions in EU manufacturing in 2021. As these sectors are capital intensive and subject to very long investment cycles, taking short-sighted financial decisions or investing in false solutions could lead to decades of further carbon lock in, harming the long-term competitiveness of EU industry, and seriously compromise the EU's ability to reach both its 2030 climate targets and 2050 climate neutrality goal.

In this regard, how the European Union spends revenues coming from the EU carbon market is critical. This means policymakers need to look closely at how much financial support energy-intensive industries received through the EU ETS to date, and see how making them pay for their pollution could instead be reinvested into innovative and green solutions that would lead to real decarbonisation and transformation of these sectors rather than maintaining an untenable status quo.

This report employs the same methodology as a previous Carbon Market Watch report, builds upon recommendations from previous WWF reports on the use of ETS revenues, and uses data from the European Commission's website on all projects financed by the EU ETS Innovation Fund. It presents an overview of which sectors and companies have the biggest carbon footprint in the EU, which received the most free pollution permits in 2023, and which sectors and technologies have so far benefited the most from the EU ETS Innovation Fund. It also draws conclusions from this analysis on how to improve the current ETS system to make sure it delivers on its purpose: to support industrial decarbonisation, to ensure rapid cuts in emissions and to help guarantee EU industry remains globally competitive.

2 Identifying the top polluters

The majority of EU manufacturing emissions come from a relatively small number of sectors. While the production of electricity remains the top polluting sector, it largely pays for its pollution under the EU carbon market and has been decarbonising rapidly. In contrast, steel, cement, oil refining and chemical production, which are all at the top of the polluting league, receive enormous volumes of ETS free allowances. Other highly polluting industries, such as aluminum, glass, and paper and pulp, also receive generous free allocations.

For each sector, we compare the volume of emissions with the amount of free allowances between 2010 and 2023. We also assess the budgeted free allocations to be handed out up to 2030. In addition, we identify the major polluting companies and the free pollution permits they received in 2023.

Finally, we highlight different decarbonisation options for each sector. The options presented do not reflect the view of the writing organisations, but they merely present a review of the existing technology paths.

Steeling the show

One of the most polluting sectors in the European Union, steelmaking must radically reduce its emissions if the EU is to achieve climate neutrality before 2050. Steel products can broadly be categorised into two types: flat steel products, such as steel sheets used in the automotive sector, and long products, such as beams or rods used for structural applications.

European steel producers release around 1.9 tonnes of CO2 per tonne (tCO2/t) of steel, with wide local variations. For example, Polish and German steel plants emit up to three times more CO2 per tonne of crude steel produced compared with Italian or Spanish plants (principally due to the differences in the countries' energy mixes). To bring the EU steel sector in line with the transition to climate neutrality in 2050, its emissions have to fall by at least 48% by 2030 and 97% by 2050 compared with 2020 levels.

Decarbonisation options

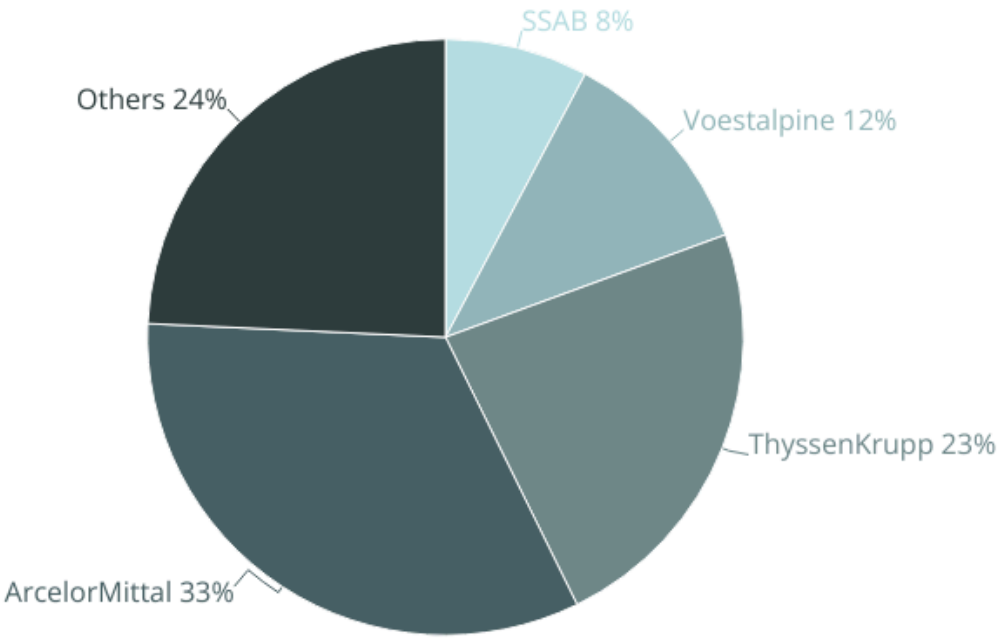
Replacing the gas-based blast furnace (BF-BOF) route with fossil-free hydrogen direct reduced iron (DRI) plants coupled with based electric arc furnaces (EAF), while increasing scrap recycling and usage and using fossil-free electricity in EAFs can bring the EU steel industry close to zero emissions. It's worth noting that, given the size of the industry, the amount of fossil-free electricity required for steel decarbonisation is immense, regardless of the production route. At the same time, hydrogen infrastructure (both for production and transportation) is lacking, making fast investments essential in achieving the steel sector transformation.

Worst performers

Huge conglomerates have dominated the capital-intensive European steel production sector for decades. Multinational ArcelorMittal is responsible for a third of the total EU steel sector emissions, with a gigantic 33 millions tonnes of CO2 emitted in 2023, which is higher than the annual emissions of Denmark, and represents a third of the EU steel sector's emissions. ThyssenKrupp emitted over 24 million tonnes of CO2, representing around 20% of the bloc steel production emissions. Together, the two companies account for half of the sector's total carbon footprint. Third, behind by a pretty big margin, is local producer Voestalpine.

Company	**Headquarters**	**Emissions** (tonnes/CO2 in 2023)	**Free allowances** (in 2023)	**Ratio of free allowances to emissions**
ArcelorMittal	Luxemburg	33,046,950	45,370,513	136%
ThyssenKrupp	Germany	24,062,605	22,140,195	92%
Voestalpine	Austria	12,029,030	9,472,960	78.7%
SSAB	Sweden	8,789,068	7,732,193	88%

2023 steel production emissions



ARCELORMITTAL BACKTRACKING

In late 2024, ArcelorMittal announced its plans to shelve its five direct reduced iron (DRI) projects in Spain, Germany, France and Belgium, after pledging to reduce 35% of its CO2 emissions by 2030. The steel giant ditched its decarbonisation plans despite generous support from taxpayers in three countries to the tune of at least €3 billion, not to mention the €3.76 billion worth of free ETS pollution permits it received in 2023 alone. One of the Belgian DRI projects for 2023 will be partly funded through the Innovation Fund.[2]

The company cited the slow development of green hydrogen, as well as policy and market uncertainties. The company said it was "expecting several developments in 2025, including the scheduled review of the EU Carbon Border Adjustment Mechanism (CBAM) and the publication of the Steel and Metals Action plan. When complete, these initiatives will provide the parameters needed to shape the business case for decarbonisation investments in Europe."

While regulatory certainty is key for long-term financial stability, the European Green Deal already offered that. Moreover, ArcelorMittal's history of backtracking from its climate commitments, from backing down from publicly funded projects to its flawed climate strategy, despite the generous state subsidies it has already cashed in,make its policy asks for the CBAM and steel action plan disingenuous.

ArcelorMittal is currently the single most CO2 polluting industrial company in Europe.

2 The project is named Zero Emission Steelmaking (ArcelorMittal), but we do not know the final amount of money to be granted by the Innovation Fund as the grant agreement is due to be signed in Q1 2025. See the European Commission website

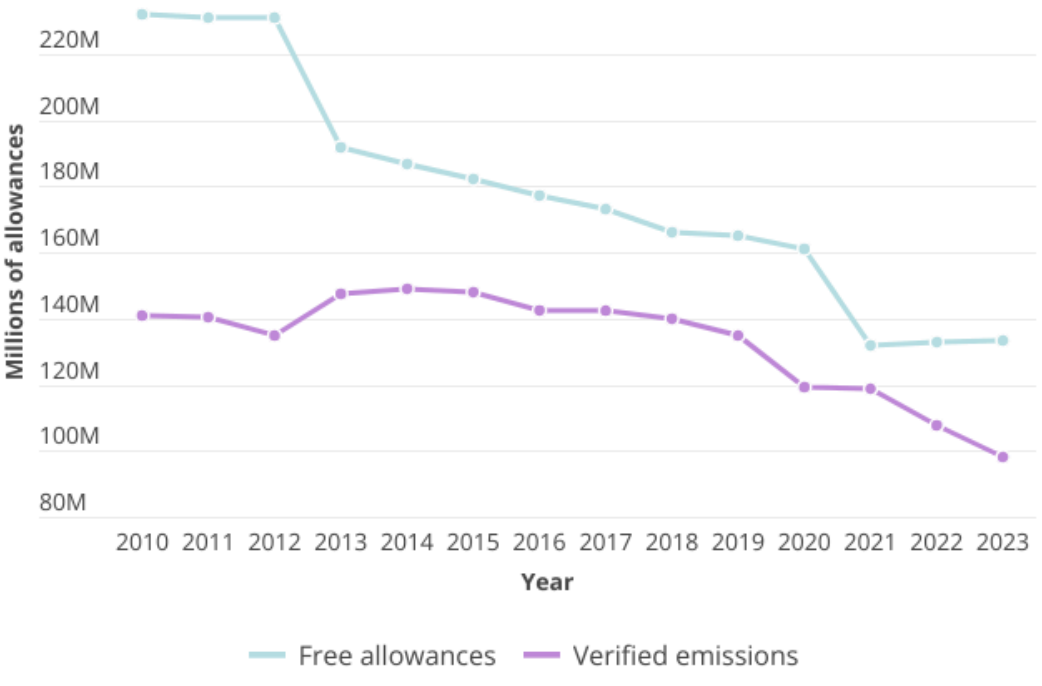
A brief history of freebies

Since the inception of the EU ETS, steelmakers have received billions of free allowances. Part of this historical overallocation can be explained by the fact that the steel producers received some free pollution permits to cover the emissions of blast furnace waste gases, which they then transferred to energy companies generate the required electricity or heat. However, phase 2 of the EU ETS (2005-2020) supplied the sector with so many free allowances that these not only covered their emissions but also allowed them to make windfall profit out of them, as documented by Carbon Market Watch. Even today, steel emissions are fully covered by free allocations. The situation will only start changing slowly with the introduction of CBAM pricing in 2026.

The European steel industry receives free allocation on the basis of five product benchmarks (coke, sinter, hot metal, electric arc furnace-EAF carbon steel, and EAF high alloy steel), as well as the fuel and heat fall back benchmarks for those processes that are not covered above. This approach, covering several steps in the value chain, does not favour low-emitting modes of production, such as EAF steel, but merely allocates more free allowances to those who pollute the most (BF-BOF).

Steel emissions and free allowances

Volumes in 2021-2030 (in millions/EUAs)



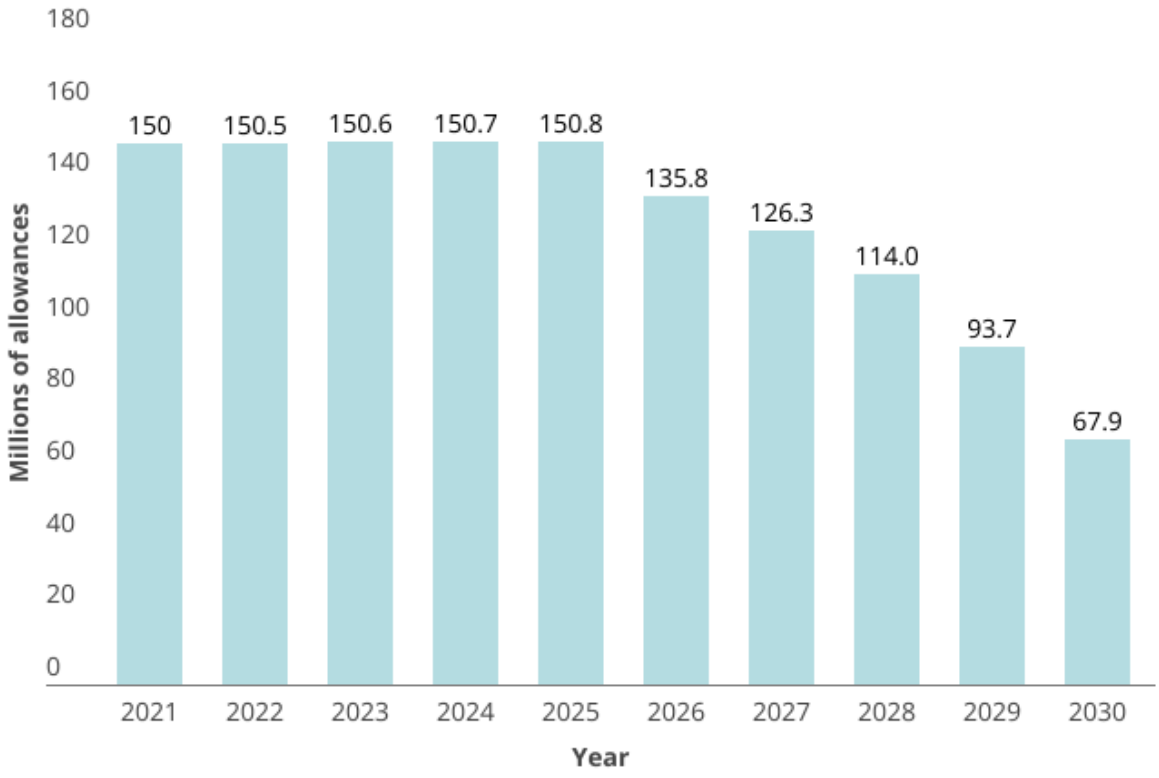
Free allocation: what to expect?

As explained above, the Free Allocation Regulation sets the rules for allocating allowances to steel products in such a way that does not incentivise cleaner production. From 2026 onwards, free allowances will start to decrease with the introduction of the CBAM factor, starting at 2.5% in the first year and gradually increasing up to 100% in 2034, when full pricing will kick in. This means that these freebies will only be eliminated almost a decade from now. In the meantime, as the graph shows, hundreds of millions of allowances will still be distributed, shielding the industry from the full price of their pollution. Beyond 2034, some free allowances will still reach the steel sector.

The current CBAM Regulation only takes into account direct emissions of carbon dioxide for iron and steel products (scope 1 emissions), but excludes ferro-alloys (ferro-silicon and ferro-phosphorus) and ferrous scrap. Therefore, not all steel precursors (or intermediate products) will be covered by CBAM, which means that free allowances for them will continue.

Steel free allowances

Volumes in 2021-2030 (in millions/EUAs)



Cemented in its ways

Cement is one of the most manufactured materials in the world. In Europe, cement is primarily used in the construction of buildings (50%), infrastructures (30%) and for various forms of maintenance and repair work across these two categories (20%).

Cement is used in construction to bind other materials together, and is mixed with sand, gravel and water to produce concrete. The production of clinker, which acts as the binder, is crucial to make “standard” cement (commonly referred to as Portland cement). Around 90% of CO2 emissions from cement manufacturing result from the production of clinker, an intermediate product used to manufacture cement.

Decarbonisation options

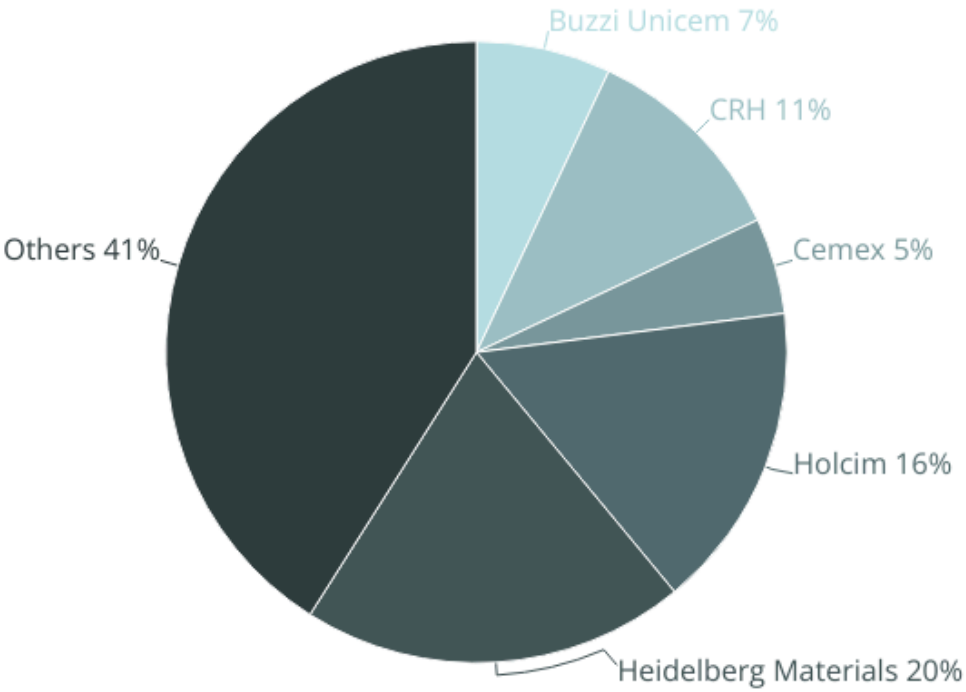
The EU cement industry has made glacial progress towards reducing its emissions. This is partly due to the fact that the sector has relied on measures to boost energy efficiency and to switch fuels, but put little effort into tackling the pollution from the chemical process of limestone calcination in the clinker kiln. Reducing these stubborn emissions will require enhanced circularity and material efficiency, as well as the roll out of some emerging technologies that would reduce the clinker-to-cement ratio. These include, but are not limited to, the use of clinker substitutes (commonly known as supplementary cementitious materials) to reduce the share of clinker in traditional Portland cements; the use of recycled clinker; the use of alkali-activated binders in concrete which substitute the need for traditional cement/clinker altogether (e.g. geopolymer concrete); or the use of alternative clinkers using different feedstock and/or production methods. Finally, technology options are available to capture emitted CO2 and either store it (carbon capture and utilisation, or CCS) or chemically bind it into construction materials through carbon capture and utilisation (or CCU) technologies.

Worst performers

The lion's share of emissions of the EU cement sector are caused by only a handful of companies: HeidelbergCement, Holcim, CRH, Buzzi Unicem and CEMEX were collectively responsible for around 60% of the sector's emissions in 2023. Cement companies seem to be able to cover all of their emissions through free allocation, and in several cases receive more allowances than tonnes of CO2 emitted.

Company	Location	Emissions (tonnes/CO2 in 2023)	Free allowances (in 2023)	Ratio of free allowances to emissions
HeidelbergCement	Germany	20,124,083	21,329,441	106%
Holcim	Switzerland	16,440,097	16,683,826	101.4%
CRH	Ireland	10,896,621	10,437,536	95%
Buzzi Unicem	Italy	7,604,778	7,673,814	100%
CEMEX	Czech Republic	4,688,919	5,800,617	123.7%

2023 cement production emissions



LIME FOR ACTION

Lime and plaster production is another highly polluting segment of the construction sector. In 2023, the combined emissions of cement and lime production made the construction sector the top industrial polluter in Europe.

Limestone is “calcinated” at high temperatures in a cement kiln to produce lime, leading to the release of waste CO2. This makes the lime production process unavoidably carbon intensive: while fuel emissions can be reduced by swapping fossil fuels for renewable alternatives and through the efficient use of energy, the chemical process can only be made less polluting by capturing the released emissions.

Averaging around 24 million tonnes of emitted CO2 per year since 2010, in 2023 the lime industry reached an unprecedented low of 18.9 millions tonnes, while receiving over 16 million allowances for free.

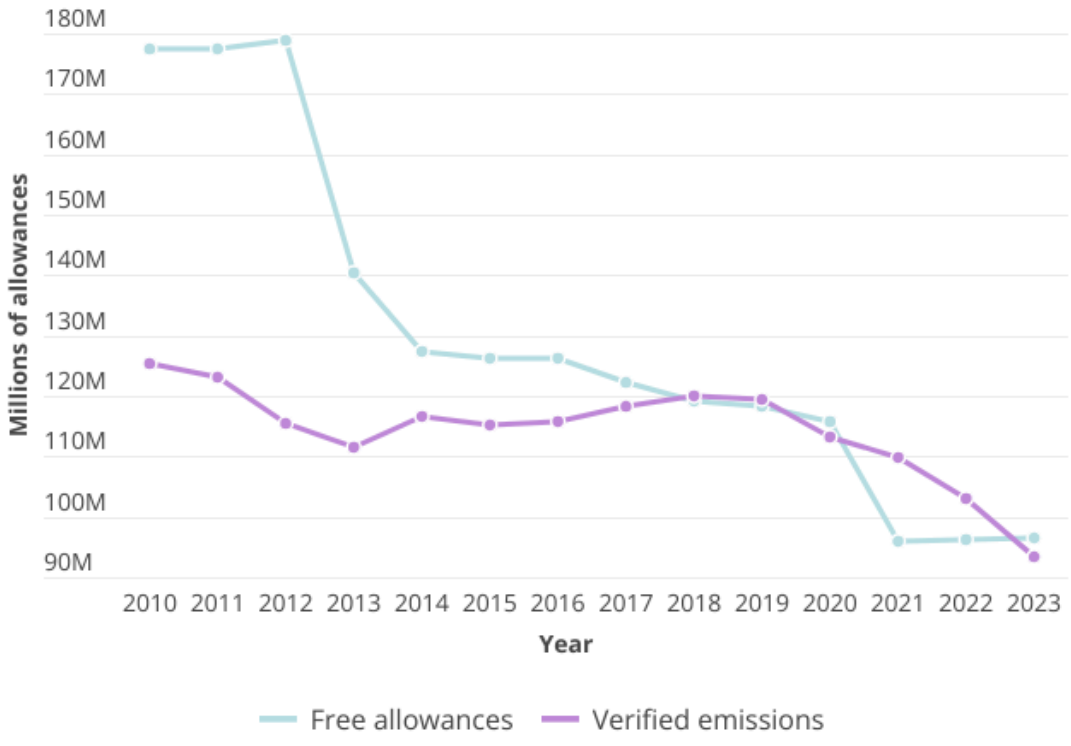
A brief history of freebies

The cement sector benefitted from consistent over-allocation of free pollution permits up until phase 3, which started in 2013 and ended in 2020. This meant that the sector received more pollution permits than it needed, paving the way for windfall profits. The beginning of phase 4 in 2021 led to benchmark improvements that reduced the volume of free, but the combined effects of high energy prices and economic stagnation led to reduced production from 2021 onwards, which led to current equal levels of emissions vis-à-vis free allocation.

The cement sector receives free allowances mostly under the two clinker benchmarks for grey and white clinkers, as well as any other hydraulic binder. A product-based approach, rather than process-based, would greatly encourage sectoral decarbonisation. Distributing free allowances based on the emission intensity of the end product would make the production of cement with low or zero clinker more viable, as the most efficient producers would receive comparatively more allowances and manufacturers producing high-clinker cement would have to pay for a bigger share of their emissions.

Cement emissions and free allowances

Volumes in 2021-2030 (in millions/EUAs)



Free allocation: what to expect?

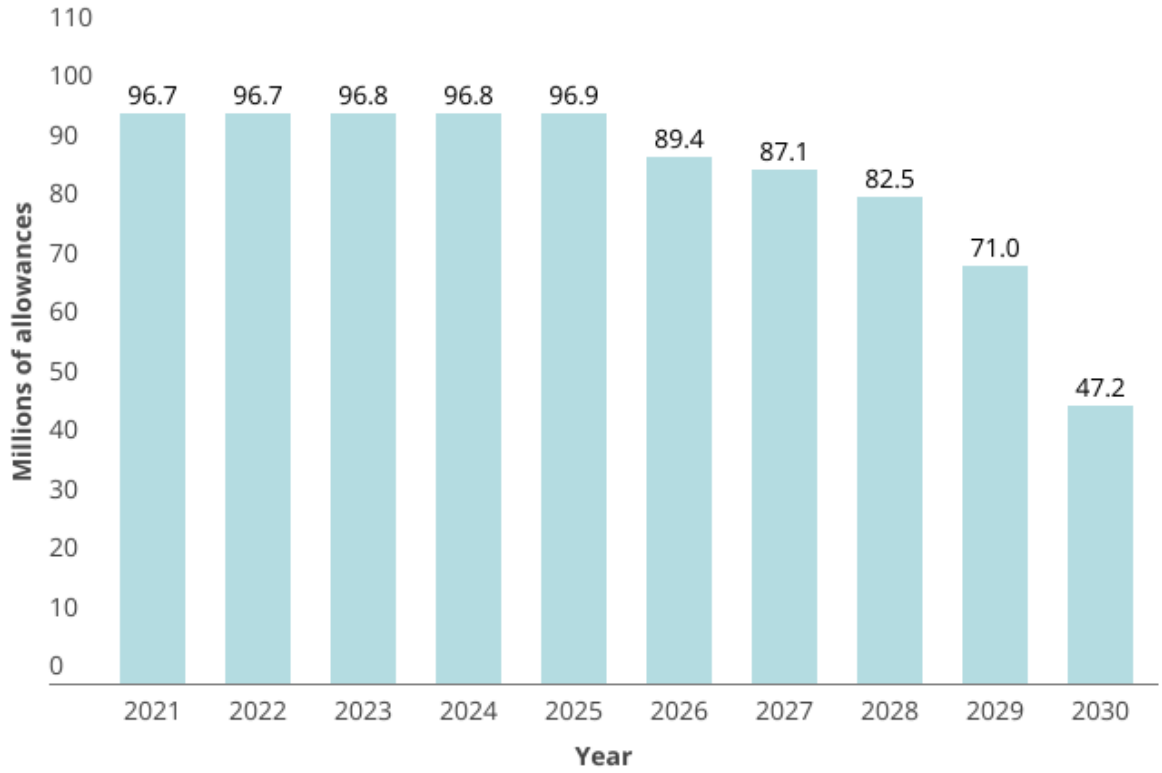
Similarly to steel, free allocation for the cement sector is set to be gradually phased out fully by 2034, thanks to the introduction of the CBAM. However, millions of free allowances are still to be allocated to the cement sector up to 2034, as shown in the graph above.

Cement is an emissions-intensive material, but is not traded much internationally This means that the risk of carbon leakage, a concept which underpins both the ETS and CBAM, is very low.

Despite this negligible risk, the current CBAM Regulation covers carbon dioxide emissions for clinkers, Portland cement and hydraulic binders. Both direct and indirect upstream emissions are covered: the CBAM Regulation defines indirect emissions as "the emissions arising from the generation of electricity used to produce the goods".

Cement free allowances

Volumes in 2021-2030 (in millions/EUAs)



Fossil fuels and chemicals: hard to break the bond

Refined petroleum products

The oil refining industry is one of the major polluters in Europe: in 2023, 10% of all EU ETS stationary emissions[3] came from oil refining. Refined petroleum production is inherently emission intensive because it deals with the distillation and chemical transformation of crude oil into various products, such as refined fuels, naphtha (essential for plastics production), and other byproducts necessary for the production of petrochemicals.

3 Energy production and industrial installation. It excludes aviation emissions.

Decarbonisation options

As the activity is based on the extraction, transport and refinement of fossil fuels, it is inherently polluting. Potential technology pathways can be the electrification of low and medium grade heating and the switch to green hydrogen. For process emissions (fluid cracking and distillation), carbon capture and storage (CCS) facilities directly attached to the plant can be an option. However, decreasing our reliance on fossil fuels and stopping oil refining is the most environmentally sound and most advisable path to follow.

Worst performers

Companies in the oil refining business are often vertically integrated (meaning they integrate under their ownership several segments of the value chain), and deal with extracting, transporting, refining, and burning the fossil fuels (be it oil to produce petroleum products, or gas to generate electricity). As such, it is complex to split which portion of a company's emissions to attribute specifically to oil refinement (in certain cases, they also produce base chemicals themselves, further complicating the value chain analysis). These numbers refer to the total company emissions.

Company	Location	Emissions (tonnes/CO2 in 2023)	Free allowances (in 2023)
TotalEnergies	France	18,269,856	10,075,193
ENI	Italy	16,119,902	4,944,485
Shell	UK	15,540,436	10,615,558
Repsol	Spain	12,195,624	7,551,710
OMV AKTIENGESELLSCHAFT	Austria	7,595,227	4,445,819
Saras SPA	Italy	5,603,437	2,143,510

3 Energy production and industrial installation. It excludes aviation emissions.

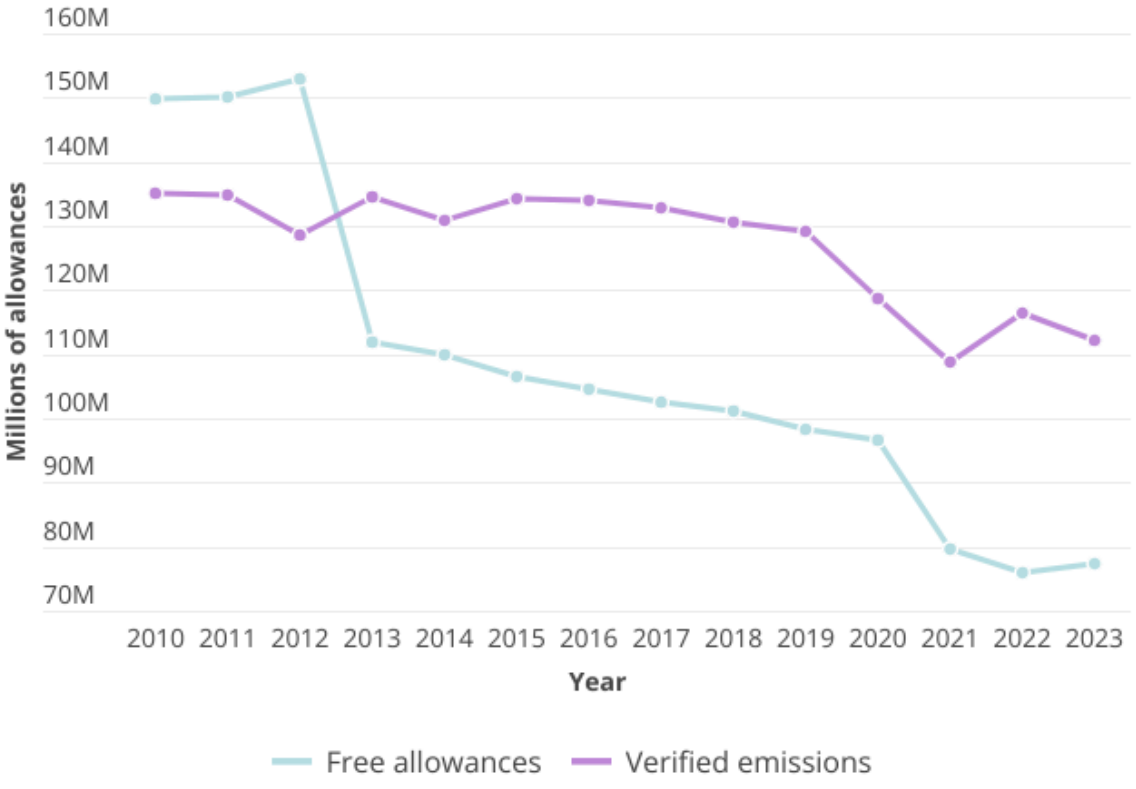
A brief history of freebies

The beginning of phase 3 in 2013 led to a noticeable and ongoing reduction of the free allowances handed out to the oil-refining sector. These free allocations are distributed through the refined oil benchmarks, which only includes certain fuel mixes.

Nevertheless, emissions from the sector have not significantly decreased due to the inherent carbon intensity of the activity.

Refined petroleum products

Volumes in 2021-2030 (in millions/EUAs)



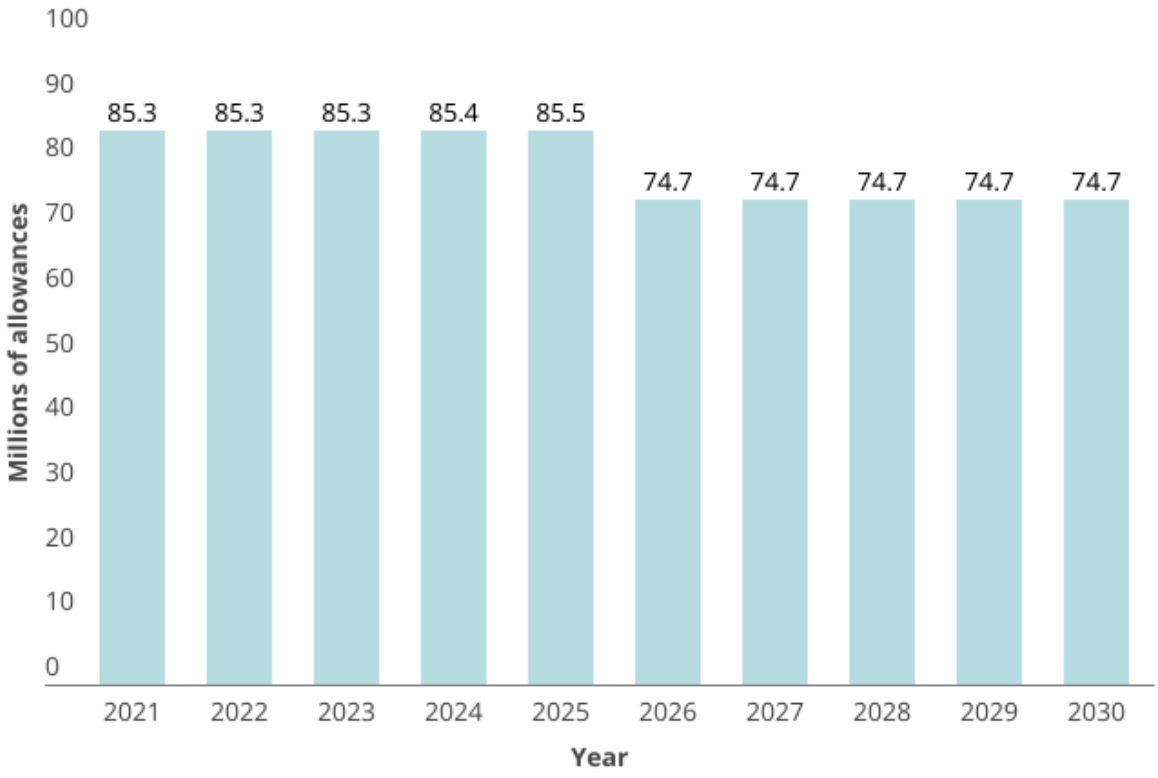
Free allocation: what to expect?

Refined petroleum products are not included in the CBAM, and under the current EU ETS legislation, they will not receive free allowances after 2030. Fossil fuel companies will likely ask EU policymakers to continue their free allowances after 2030.

Recent research highlights that current CBAM rules only cover 50-60% of production emissions for key chemicals (such as ethylene and polyethylene) and including refinery products and fossil feedstocks as precursors would allow the EU to maintain higher climate ambition and would boost the effectiveness of the policy.

Oil refining free allowances

Volumes in 2021-2030 (in millions/EUAs)

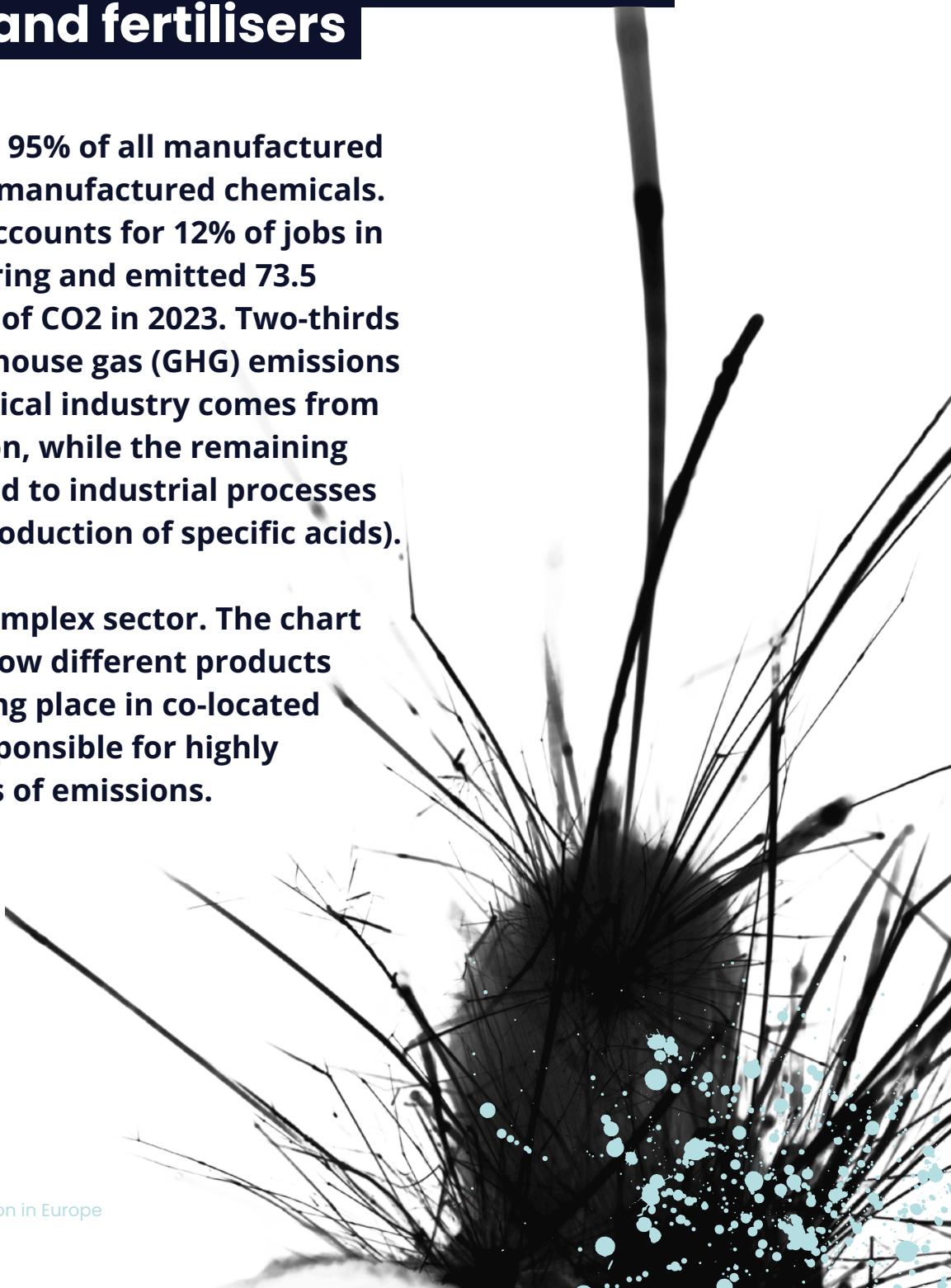


Fossil fuels and chemicals: hard to break the bond

Organic and inorganic chemicals, plastics and fertilisers

Approximately 95% of all manufactured goods contain manufactured chemicals. The industry accounts for 12% of jobs in EU manufacturing and emitted 73.5 million tonnes of CO2 in 2023. Two-thirds (67%) of greenhouse gas (GHG) emissions from the chemical industry comes from fuel combustion, while the remaining third was linked to industrial processes (such as the production of specific acids).

It is a highly complex sector. The chart below shows how different products (normally taking place in co-located plants) are responsible for highly different levels of emissions.



Decarbonisation options

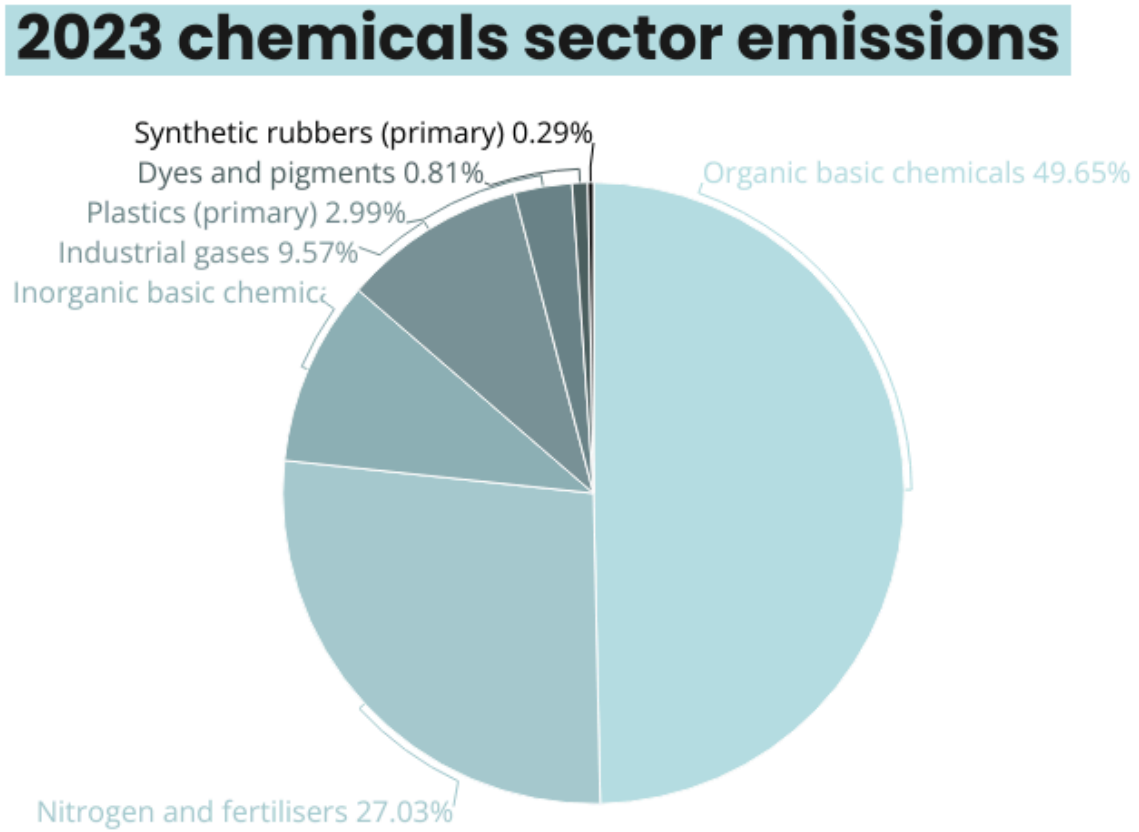
The complexity of the chemicals value chain and their omnipresence in the products we use and consume have kept the sector under the radar of decarbonisation efforts. While process emissions have slightly decreased (primarily due to nitrous oxide abatement technologies), CO2 emissions remain stubbornly high. Several non-mutually exclusive paths are available:

- Relying on circularity by enhancing mechanical and chemical recycling and increasing overall material efficiency are critical steps.
- Decarbonising processes by electrifying heat generation, improving energy efficiency through advanced process optimisation and heat recovery systems, and transitioning to green hydrogen for high-temperature processes.
- De-fossilising feedstocks by producing them from green hydrogen and/or a sustainable source of nitrogen, carbon, oxygen or other elements. These alternatives reduce dependence on fossil-based naphtha or gas.
- Developing alternative chemistries can lead to more sustainable polymer production. For example, bio-based materials, enzymatic pathways, and fermentation processes offer renewable and lower-emission routes for producing plastics and chemicals. Innovations in catalyst design and alternative reaction pathways can further improve efficiency and lower carbon intensity.

Worst performers

**Compared to other sectors, this list may be incomplete due to the integration of many chemical companies with oil&gas companies. Companies such as TotalEnergies, OMV, ExxonMobil produce chemicals alongside their oil refining activities. This list was compiled by taking into account the main companies producing chemicals that do not have an oil&gas segment in their business portfolio.*

Company	Location	Emissions (tonnes/CO2 in 2023)	Free allowances (in 2023)	% of free allowances over emissions
BASF	Germany	8,757,551	9,841,888	112.3%
Yara International	Norway	6,934,209	7,707,452	111%
INEOS	United Kingdom	5,525,022	6,022,439	109%
AirLiquide	France	3,695,387	2,943,518	79%
Solvay	Belgium	3,247,930	3,867,956	119%



DON'T FORGET PLASTICS

Plastic production is largely reliant on fossil fuels, specifically natural gas liquids or naphtha derived from oil refineries. The initial stages of production are especially energy-intensive and result in significant emissions. These processes involve cracking hydrocarbons (gas or naphtha) to produce monomers, which are subsequently polymerised to create various types of plastics. The complexity of these processes and their interconnected value chains makes it challenging to pinpoint the exact amount of CO2 emissions from plastic production. However, the European Environment Agency (EEA) estimates that plastic production could account for 20% of greenhouse gas emissions from the EU chemical sector, encompassing both refining and chemical manufacturing.

Research highlights three primary sources of greenhouse gas emissions in the plastic life cycle: upstream extraction and transport to refineries, steam cracking of hydrocarbons to create monomers, and the incineration of plastics. Among these, only two sources are currently covered by the EU ETS: oil refining (part of source 1) and the production of bulk chemicals (source 2). Waste incineration is currently being monitored for a potential inclusion under the EU ETS. This may be tabled by the European Commission in 2026.

While it's technically challenging to fully decarbonise plastics, and a significant reduction in consumption of this material is the most important way forward, several decarbonisation pathways for the sector are available - each with different limitations (namely, mechanical recycling, chemical recycling, bio-based materials).

Including refined fossil fuels and all "bulk" chemicals under the CBAM (and thus phasing out their free allocation) as well as covering waste incineration gases under the EU ETS would push the decarbonisation of the plastics sector.

Plastics in primary form and free allowances

Volumes in 2021-2030 (in millions/EUAs)

The significant increase of free allowances
ı 2013 can be explained with free allocation
nked to the production/ use of heat to the
eat consumers: while the emissions
appen in the heat production facility, the
eat consumer receives the allowances (as
ney are deemed at risk of free allocation).

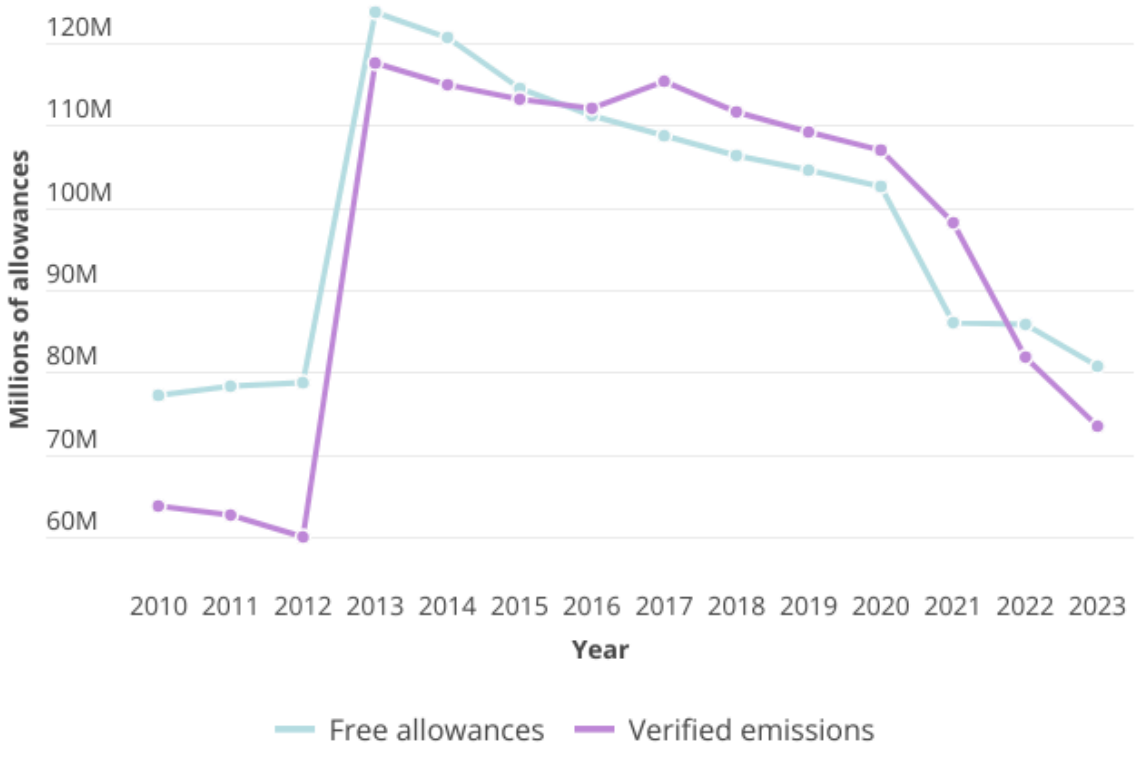
A brief history of freebies

In phase 3 (2013-2020), new sectors (mainly new chemicals) were added to the EU ETS, resulting in the net increase in 2013 shown in the graph above. From that point onwards, a gradual and very slight decrease in emissions can be observed, as mentioned above to be attributed to efficiency gains and abated process emissions. The start of Phase 4 in 2021 also led to a net decrease in free allocation, but the decreased emission (linked to increased efficiency and slightly decreased production) is allowing the total emissions to remain below the allowances freely allocated.

The sector receives free allocation under the benchmarks set for steam cracking, and the product benchmarks for soda ash, ammonia, styrene, ethylene, aromatics, syngas and hydrogen, as well as others. Default values for heat and process emissions also apply.

Chemicals emissions and free allowances

Volumes in 2021-2030 (in millions/EUAs)



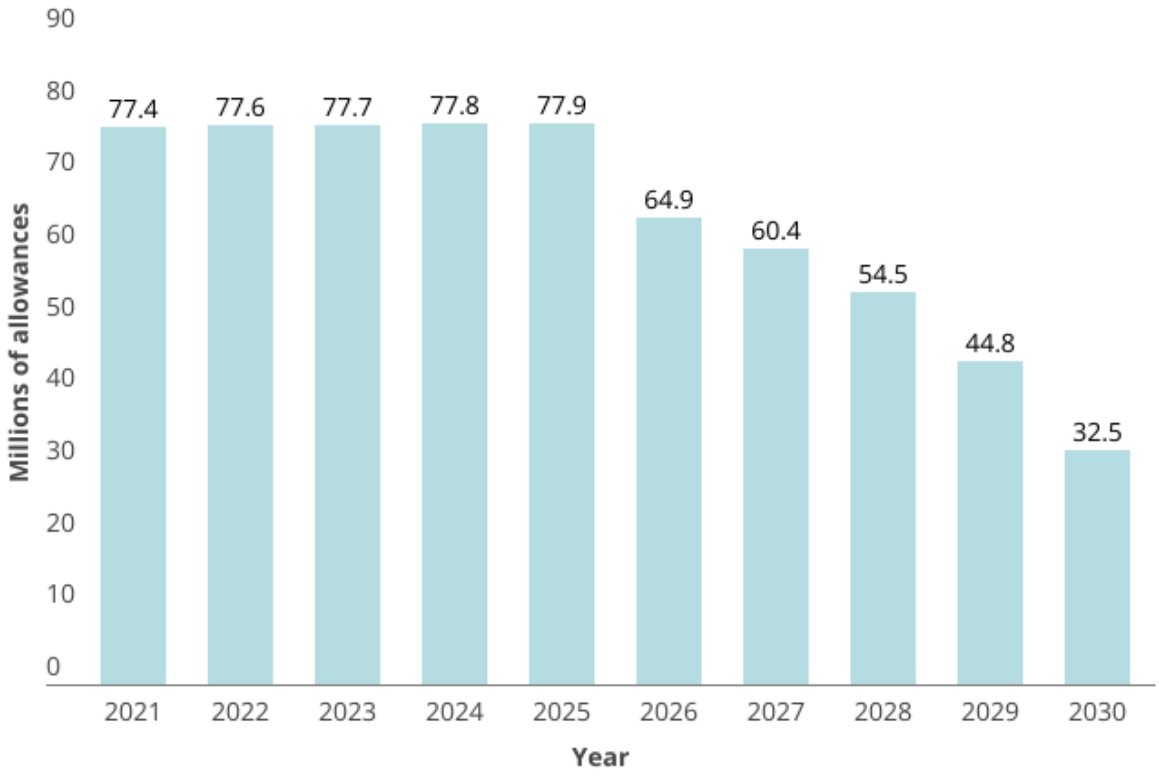
Free allocation: what to expect?

Only fertilisers, such as ammonia, nitric acid, nitrates of potassium will be included under the CBAM. As they are one of the main chemical pollutants, this will lead to a significant reduction of free allowances, but will still leave out relevant sources of pollution, such as inorganic chemicals or plastics.

Currently, the CBAM Regulation covers direct and indirect emissions of carbon dioxide and nitrous oxide deriving from fertiliser production.

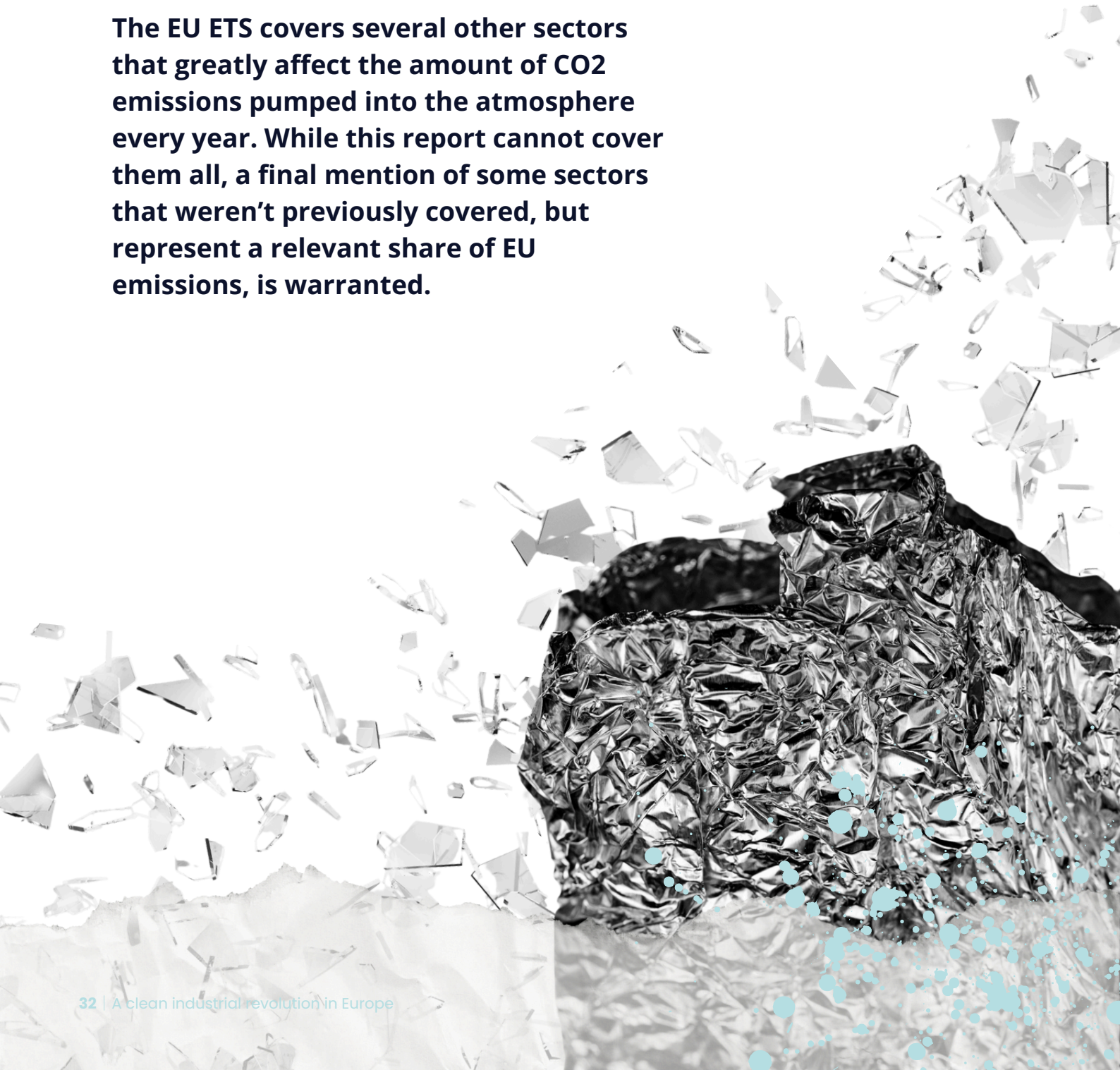
Chemicals, fertilisers and free allowances

Volumes in 2021-2030 (in millions/EUAs)



Last but not least: aluminum, glass, paper

The EU ETS covers several other sectors that greatly affect the amount of CO2 emissions pumped into the atmosphere every year. While this report cannot cover them all, a final mention of some sectors that weren't previously covered, but represent a relevant share of EU emissions, is warranted.



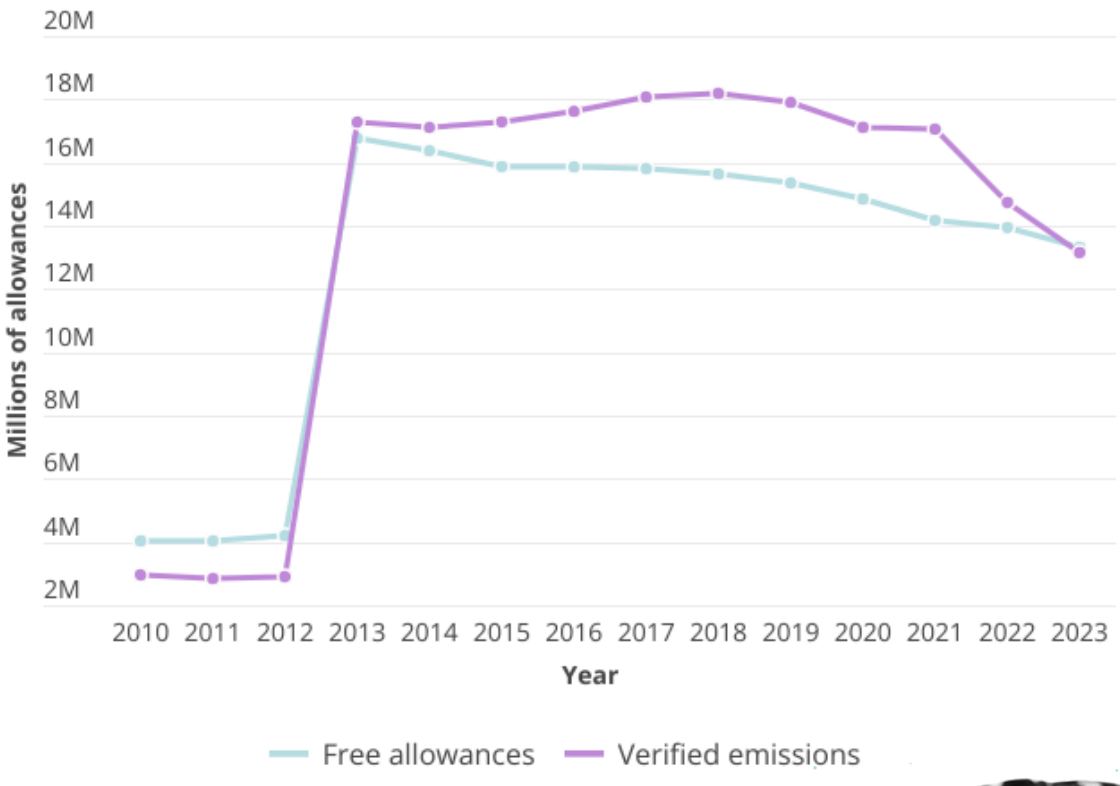
Aluminum

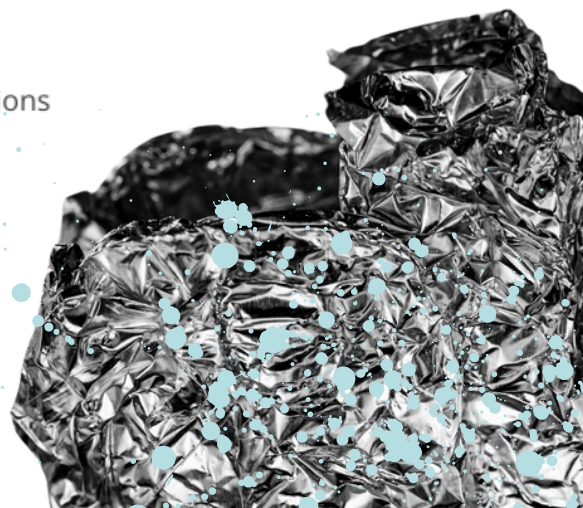
Aluminium is included under the CBAM and free allowances will be phased out starting in 2026. However, the sector is calling to close regulatory loopholes and for the inclusion of further finished or semi-finished products under the CBAM ahead of implementation due to the high risk of circumvention.

Currently, the CBAM Regulation covers both direct and indirect emissions for carbon dioxide and perfluorocarbons deriving from aluminium products.

Non-ferrous materials free allowances (aluminum, lead, copper, zinc)

Volumes in 2021-2030 (in millions/EUAs)



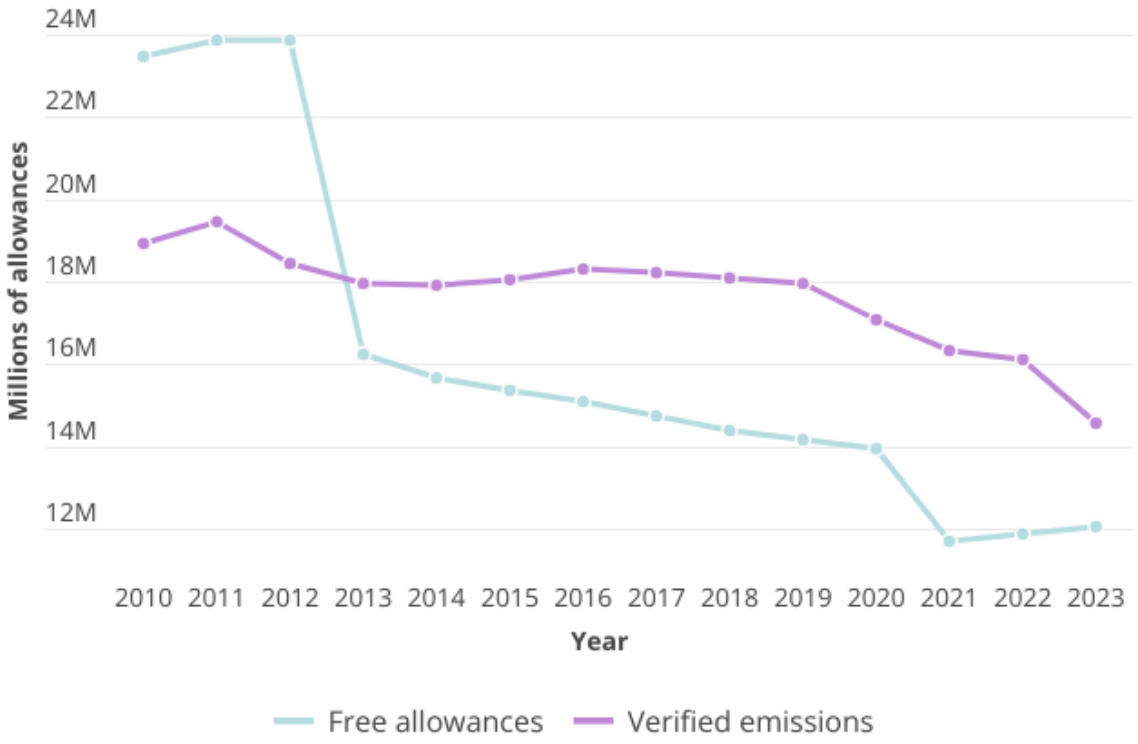


Glass

Most of EU glass production is directed towards containers for packaging beverages and food (around 60%) while 29% of production volume is flat glass for construction and automobiles. The remaining covers domestic glassware and special glass. The sector is not included in the CBAM and receives a considerable amount of free allowances.

Glass, glass products and free allowances

Volumes in 2021-2030 (in millions/EUAs)

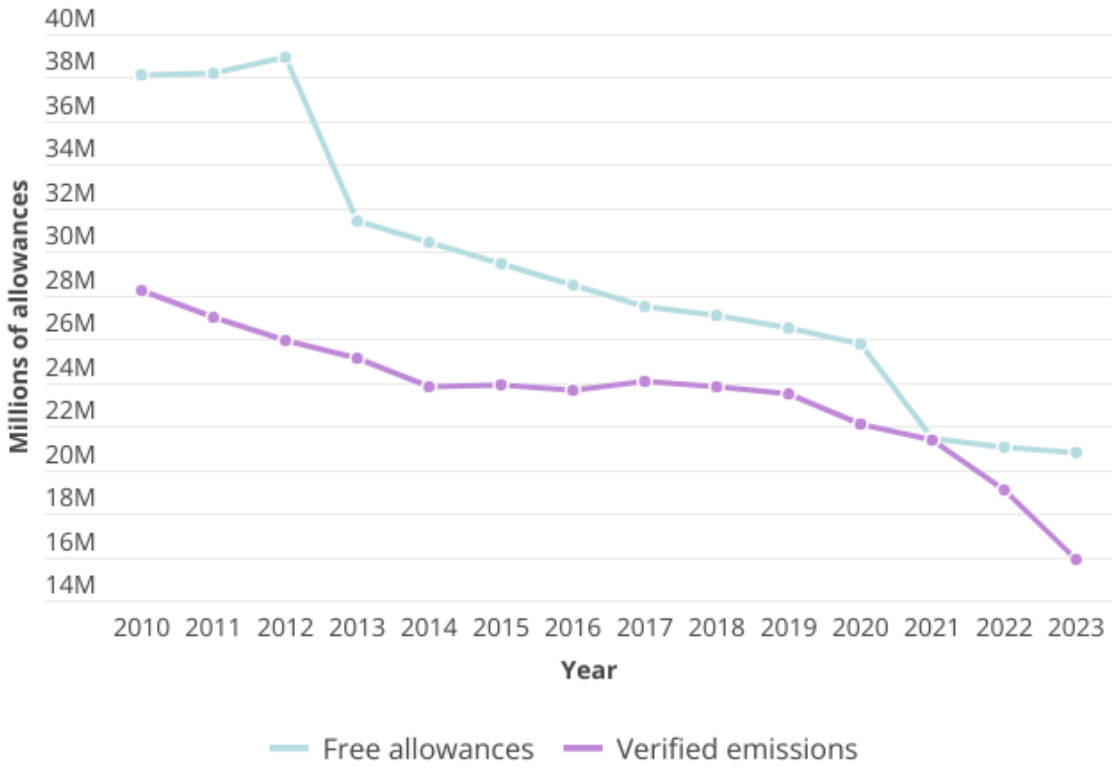


Paper

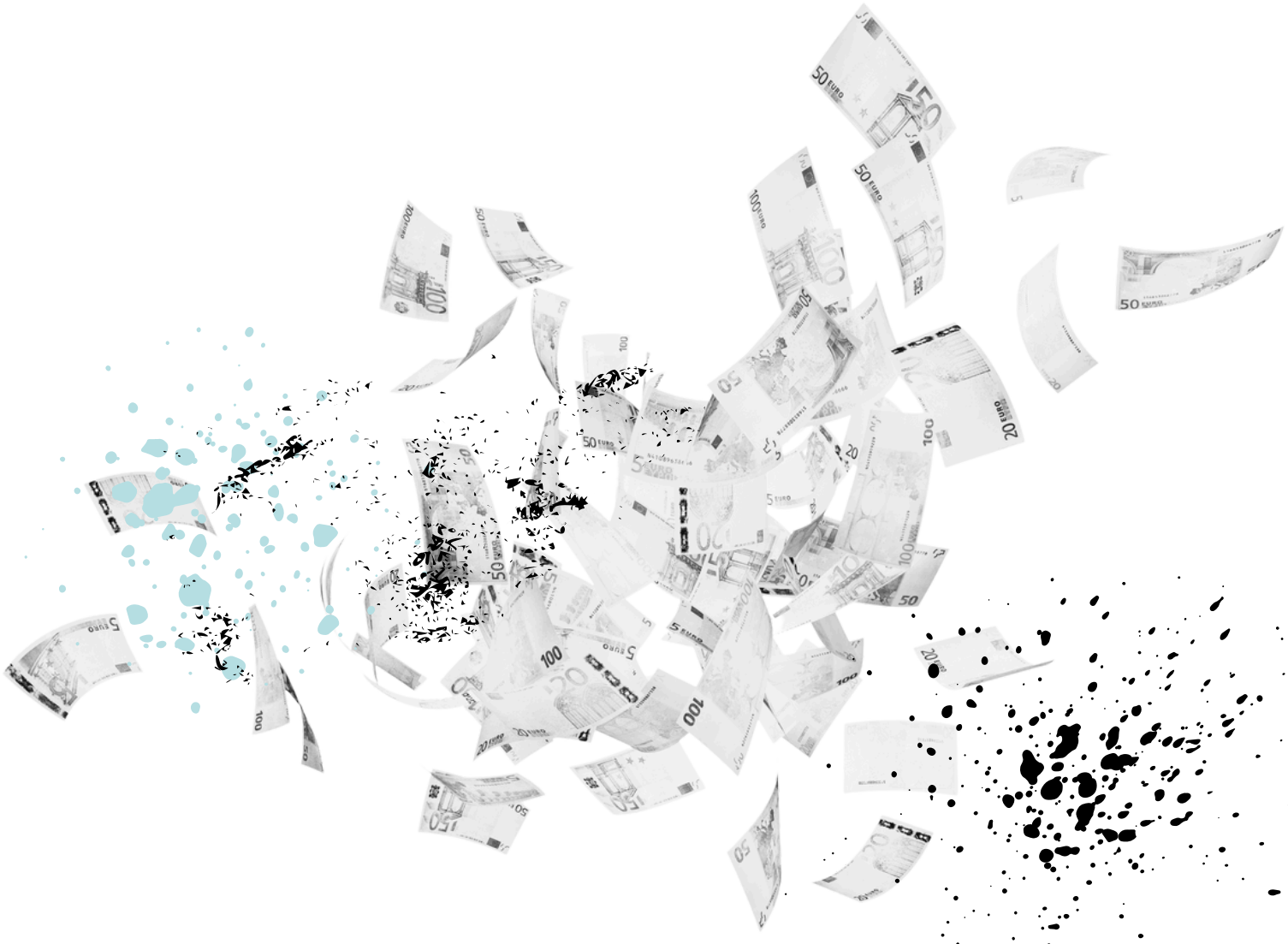
Paper and paperboard use varies greatly depending on the end product, from packaging to graphics and specialised paper grades. The sector relies heavily on circularity, with almost 80% of paper being recycled in 2023. It is also not included under the CBAM.

Paper, pulp, cardboard and free allowances

Volumes in 2021-2030 (in millions/EUAs)



3 Free allowances to heavy industry budget



EU ETS Innovation Fund
A fund-amental problem?

The way it works

The Innovation Fund is a key EU ETS funding instrument which was established to help finance low-carbon technologies and processes in the European Union, Norway, Liechtenstein and Iceland. It aims to support the roll out of low-carbon technologies in order to contribute to the decarbonisation of the sectors covered by the EU ETS, especially energy-intensive industries (for the period 2021-2030). Although agreed in 2018, the fund started functioning in 2020 with its first call for projects.

Innovation incubator

The Innovation Fund aims to finance, mainly through grants and auctions (since 2023), the scaling up of highly innovative technologies and flagship projects that are considered 'first of a kind' or not yet commercially available. To be eligible, projects must contribute to significant emissions reductions, be cost-efficient, mature and scalable. This means that projects which promote measures or technologies with a strong decarbonisation potential and which are ready to be commercialised but are not particularly 'innovative' (like high-grade steel recycling) are excluded from the fund's scope.

4 See art. 5 of the Commission delegated regulation with regard to the operation of the Innovation Fund, 26 February 2019, https://ec.europa.eu/clima/sites/default/files/innovation-fund/c_2019_1492_en.pdf.

Circular finance

The Innovation Fund is financed by revenue generated from the auctioning of EU ETS allowances. This is taken from the pools of auctioned allowances, formerly free allowances which are then sold and of allowances held in the Market Stability Reserve. The European Investment Bank is in charge of monetising the allowances and managing the Innovation Fund revenues. In 2018, the EU decided to direct 450 million allowances towards the fund. This amount was raised to approximately 530 million allowances in 2022. This equates to a total budget for this decade of around €45 billion, based on a carbon price of €85 per tonne of emissions.

Purse strings

The Commission manages the fund by giving grants under competitive calls for proposals and through auctions (since 2023), with the support of two public implementing bodies, the European Climate, Infrastructure and Environment Executive Agency (CINEA) and the European Investment Bank (EIB). Up to 60% of the 'relevant project costs' can be financed, meaning the additional costs that are borne as a result of the application of the innovative technology.[4] Projects are evaluated based on their innovation potential, emission reduction impact, and financial and technical viability.

Little changes, main challenges remain

As part of the revised EU ETS Directive and the implementation of the CBAM Regulation, changes were made to the functioning of the Innovation Fund in 2023. These included an increase in the overall volume of auctioned allowances and cancelled free allowances that are then sold (from CBAM sectors) being directed towards the fund, the addition of an auctioning system, and a broader range of projects becoming eligible for financing.

Despite these positive changes, the reforms to the Innovation Fund are not enough to overcome the significant challenges the EU ETS faces when it comes to incentivising industrial decarbonisation. To truly support the decarbonisation of the EU industry, the Innovation Fund's budget needs to rise even further, by eliminating the remaining free allowances and pumping much of the resulting revenue into the Innovation Fund and other decarbonisation efforts. Moreover, the fund needs to be refined further to ensure it also supports the deployment of clean renewable and energy saving technologies, which may not be the state of the art in innovation but are more innovative and greener than current practices.

No such thing as a free lunch

The pot of money to finance innovative clean technologies in the EU is a fraction of the size of the free allowances gravy train. For the period 2021 to 2030, the Innovation Fund's total budget is, as noted earlier, about €45 billion, while heavy industry is set to receive some €226.7 billion in free allowances over the same period.

As the Innovation Fund is an essential tool to help industry build up viable technologies to decarbonise their carbon-intensive activities, making polluters pay the full price of their pollution not only provides a powerful economic imperative for industry to clean up its act, it will also raise billions to finance the decarbonisation of the industry sector and the necessary clean and green transition.

No delaying ambition

The ultimate size of the Innovation Fund's budget, until 2030, will mainly depend on two main factors: how high the carbon price is and how fully the CBAM Regulation is implemented.

EU ETS carbon price is expected to reach

€100

per tonne of CO2 by 2030

converting to

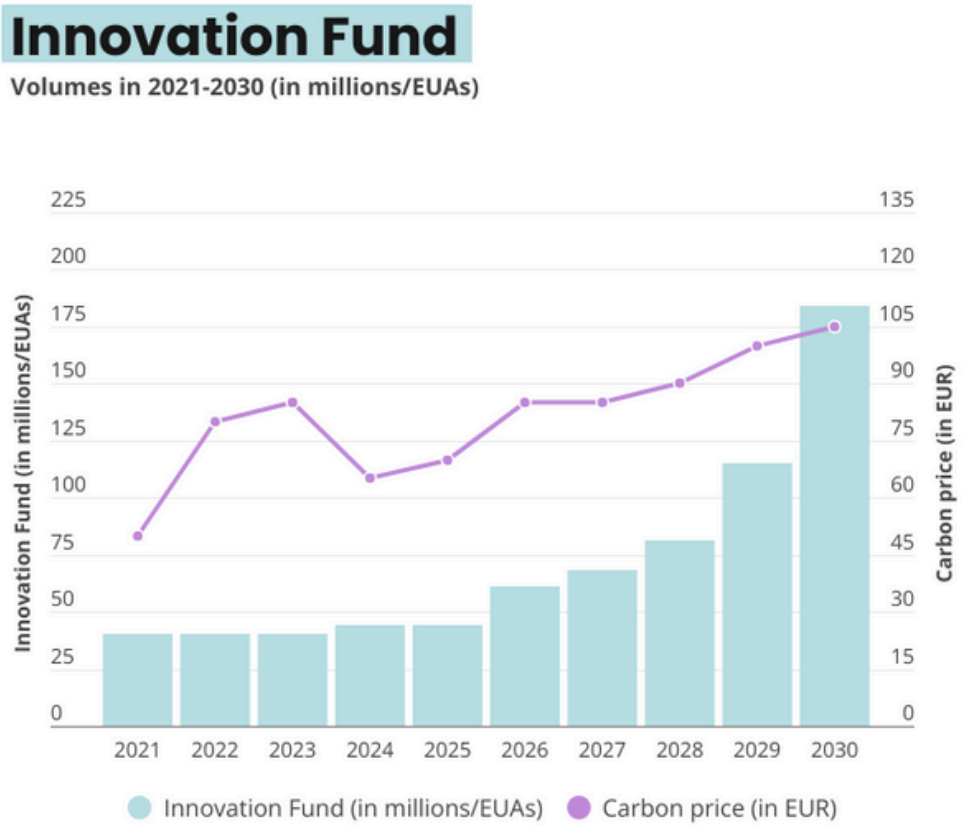
€18

billion of the Innovation Fund that year

A STRONGER CARBON PRICE

The amount of the fund's total budget depends on the carbon price. A stronger carbon price would have a direct impact on the overall budget of the Innovation Fund. The EU ETS carbon price is expected to reach at least €100 per tonne of CO2 by 2030, which would mean that the size of the Innovation Fund that year could reach €18 billion.

A strong carbon price is a driver for investments in low-carbon technologies. As the carbon price is expected to rise over the coming years, the Innovation Fund's total funding will continue to increase, provided that the number of allowances allocated to the Innovation Fund remains the same. However, as noted above, the expected value of the fund is woefully inadequate for the task it is expected to perform.



CBAM IN FULL

The size of the Innovation Fund not only depends on a high carbon price, but also on the full implementation of the Carbon Border Adjustment Mechanism (CBAM). This is because the revenue raised from auctioning the formerly free ETS allowances given to the CBAM sectors (cement, aluminium, fertilisers, hydrogen, iron and steel), which will be phased out progressively as of 2027, will be used to boost the Innovation Fund's budget[5]

As shown in the graph below, if the full implementation of the CBAM is delayed by two years, the Innovation Fund's budget will be way lower than what was agreed by EU policymakers in 2022. In terms of numbers, in 2030 alone, the Innovation Fund should, under the current scenario, reach about **184 million** allowances. However, if the implementation of the CBAM is delayed by two years (from 2026 to 2028), this number will more than halve, dropping to around **90 million** allowances.[6]

This means **94 million** allowances would be lost in free allowances by 2030, instead of being invested into the Innovation Fund. Instead of having an Innovation Fund worth about €18 billion in 2030, it would be about €9 billion. In total, a two-year delay of CBAM implementation would translate in **€20 billion** of foregone revenue that would not be invested in innovative clean technologies in the 2026-2030 timeframe. This would further hobble EU industry's ability to decarbonise and boost its clean tech competitiveness, while setting back the EU's climate goals.

The Innovation Fund should reach about

184

million allowances in 2030

dropping to around

90

million allowances if delayed

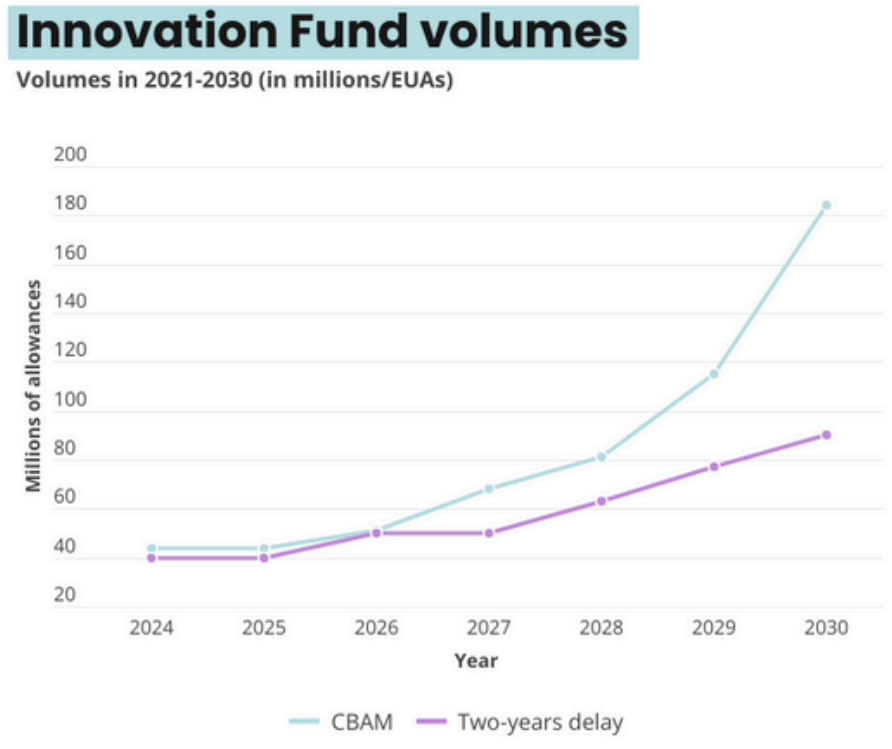
94

million allowances would be lost

A two-year delay of CBAM means

€20

billion of foregone revenue



6 Assuming an average carbon price of 85e/ton of CO2

The Innovation Fund heavily financing carbon capture technologies

Before the entry into force of the Innovation Fund

The Innovation Fund has supported innovation in such technologies as carbon capture and utilisation (CCU), carbon capture and storage (CCS), products substituting carbon intensive ones (such as hydrogen), and innovative energy storage technologies. Prior to the Innovation Fund, the New Entrants' Reserve (NER 300), was supported, also through grants, the same type of technologies between 2013 and 2020. It was worth €2.1 billion. One major focus of NER 300 was the financing of CCS projects. However, the Court of Auditors found out in 2018 that none of the CCS projects financed by NER300 saw the light of the day. This resulted in about €244 million of wasted investments.

Recurring error

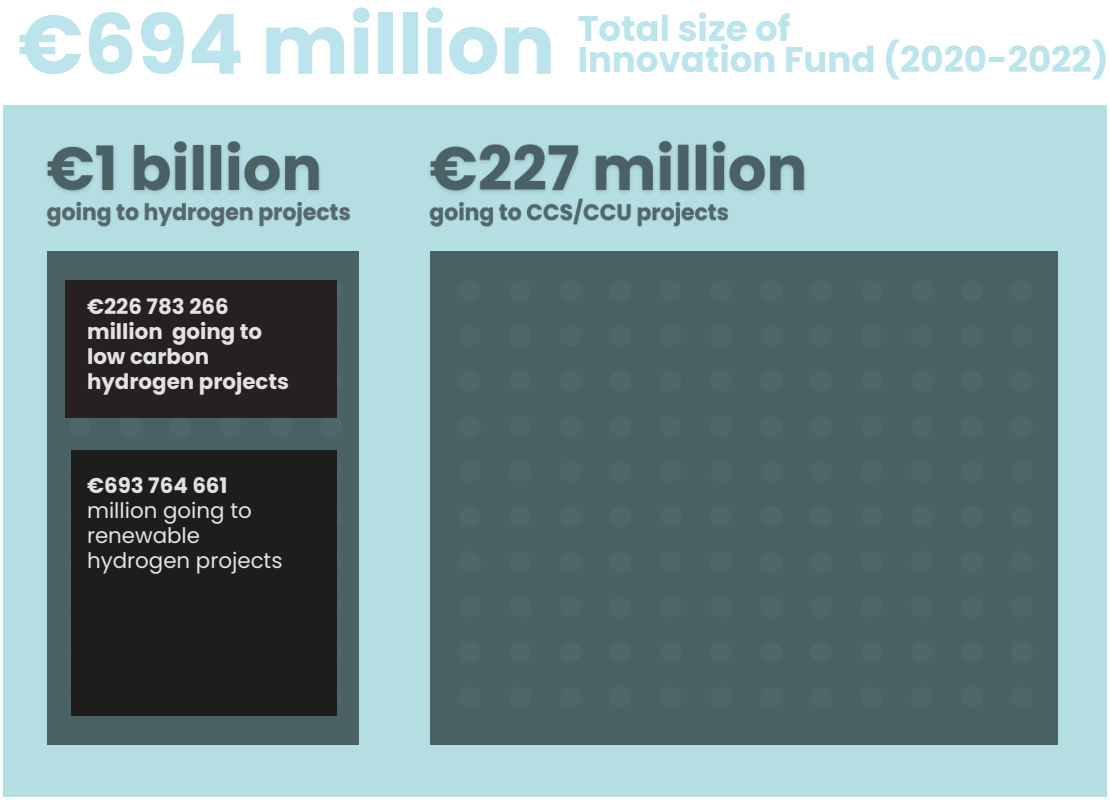
The From 2020 to 2022, the Commission ran six competitive calls for proposals, divided evenly between large-scale and small scale projects. Despite the failure of CER 300 investments, the selected large-scale projects focused heavily on the deployment of CCS and/or CCU projects for energy-intensive industries. In fact, out of **€6.4 billion**, more than **€2.5 billion** went directly into financing CCS and CCU projects. In comparison, a bit less than €1 billion was granted to low-carbon and renewable hydrogen projects.

Most of the small-scale projects for the years 2020 to 2022 focused on projects related to the power sector, such as the deployment of renewable energy and energy storage capacity. In addition to large-scale projects financing either low-carbon or renewable hydrogen, there are also eight large-scale projects focused on the manufacturing of components for the production of renewable energy, energy storage or renewable hydrogen (including electrolysers production), worth more than €600 million for the year 2022, and a single project for the year 2021 focusing on storage (battery).

From 2020 to 2022, more than one third of the total Innovation Fund budget went to financing CCS and CCU projects. Most of these projects were targeted at the decarbonisation of the cement and lime sector, or to building CO2 storage capacity across the EU.

7 Large-scale projects are defined as projects that require substantial financial resources, often in tens or hundreds of millions of euros. To be eligible, CAPEX (capital expenditure) of the project must be above €100 million. While small-scale projects are projects with a CAPEX between €2.5 million and €20 million.

8 'Fixing the Commission's innovation fixation: three recommendations for the overhaul of the Innovation Fund', Sandbag and Carbon Market Watch, May 2023



While we acknowledge that there might be a need to support the deployment of CCS technologies to address unavoidable emissions in targeted sectors, such as cement and lime, the fact that a third of the Innovation Fund's total budget (from 2020 to 2022) went towards CCS technologies, which also tend to be energy intensive, is shocking. The fact that CCS/CCU technologies have been perceived as the primary solution to decarbonising the ETS sectors represents a monumental waste of time and resources.

As alternatives are being developed to support industrial decarbonisation, including in the challenging cement and lime sector through, for example, clinker substitution, more of the budget of the Innovation Fund should go towards technologies that encourage savings in the use of materials. This would mean that the rules of the Innovation Fund should be changed. To do so, materials saving should be explicitly assessed as a mandatory criterion with equal importance to the degree of innovation when assessing candidate projects.

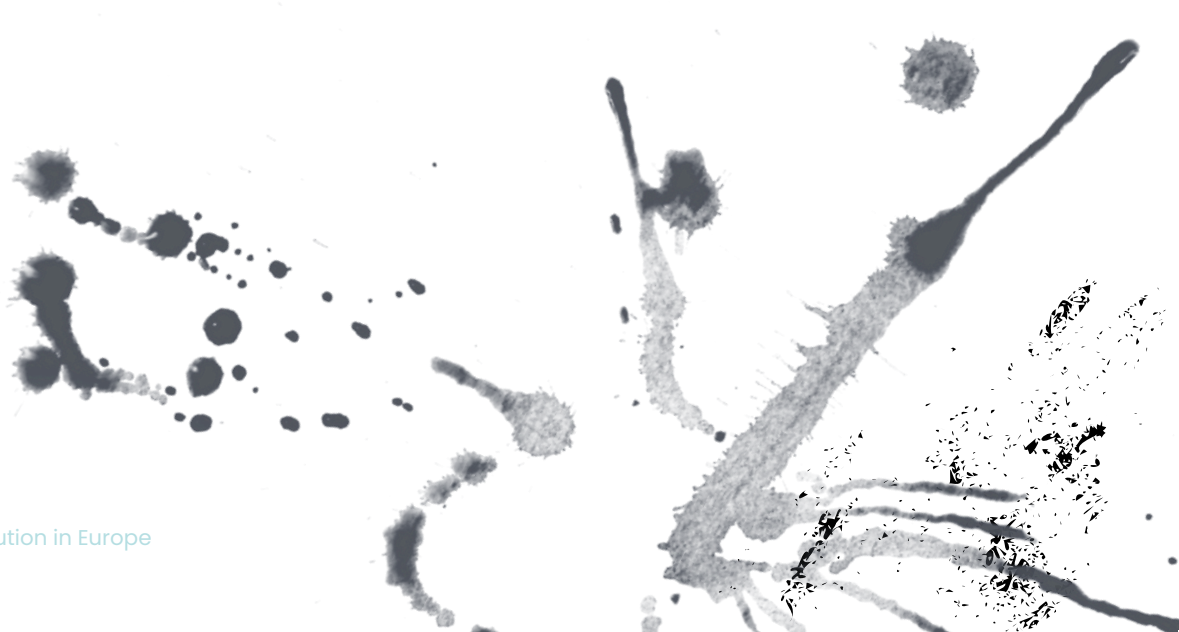
4 See art. 5 of the Commission delegated regulation with regard to the operation of the Innovation Fund, 26 February 2019, https://ec.europa.eu/clima/sites/default/files/innovation-fund/c_2019_1492_en.pdf.

Amount of large-scale projects selected focusing on CCS, CCU and BECCS in total Innovation Fund (for 2020 to 2022)

Date	Call for large-scale projects	Total number of projects selected	Total allocated to the IF	Number of CCS/CCU projects selected	Amount allocated to CCS/CCU projects	Number of BECCS projects selected	Amount allocated to BECCS projects
2020	1st call	7	€1.1 billion	2	€510,286,598	1	€180,000,000
2021	2nd call	17	€1.5 billion	7	€989,188,168	/	/
2022	3rd call	41	€3.8 billion	5	€1 billion	/	/

Amount of large-scale projects selected focusing on low-carbon (or fossil-based) hydrogen and renewable hydrogen in total Innovation Fund (for 2020 to 2022)

Date	Call for large-scale projects	Total number of projects selected	Total allocated to the IF	Number of CCS/CCU projects selected	Amount allocated to CCS/CCU projects	Number of BECCS projects selected	Amount allocated to BECCS projects
2020	1st call	7	€1.1 billion	2	€510,286,598	1	€180,000,000
2021	2nd call	17	€1.5 billion	7	€989,188,168	/	/
2022	3rd call	41	€3.8 billion	5	€1 billion	/	/



Reformed EU ETS

The implementation of the reformed EU ETS kicked off in 2023. It was the biggest call for large-scale projects so far, with a total budget of €4.8 billion in grants. There were 85 projects selected and announced by the Commission by the end of 2024. As we write this report, grant agreements between CINEA and companies responsible for the projects are expected to be signed (planned for Q1 2025). The specificity of this call for proposals is that it also considers projects which aim to develop the manufacturing of clean technologies, such as components to produce heat pumps, electrolysers, etc.

In addition, the year 2023 marked the launch of the Hydrogen Bank, with the first EU-wide auction for the production of renewable hydrogen or RFNBO (renewable fuel of non-biological origin hydrogen). Seven projects were selected and amounted to €720 million.

Sectors focus

The sector covered by the ETS benefitting the most from the Innovation Fund is the cement and lime sector; with about 11 projects worth almost €2 billion approved between 2020 and 2022. In addition, two small-scale projects, worth nearly €9 million, were selected. Most of the projects are focused on using CCS to reduce emissions from the sector through the deployment of CCS technology. Only one project is looking at clinker substitution (project Eraclitus in Spain, received €4.5 million from the Innovation Fund).

As a result of the call for proposal for the year 2023, three large-scale projects focusing on the decarbonisation of cement and lime sector were selected and promised around half a billion euros in grants. In total, from 2020 to 2023, the cement and lime sector received at least **€2.5** billion in grants from the Innovation Fund.

The second sector benefitting the most from the Innovation Fund is the chemicals industry, which received almost **€1 billion** (from 2020 to 2022). While the refineries sector comes third with about half a billion euros, and steel comes fourth with nearly €400 million (from 2020 to 2022).

9 The specificity of this call was that it targeted different projects: General decarbonisation (large scale): €1.7 billion, general decarbonisation (medium scale): €500 million, small)scale projects: €200 million, clean tech manufacturing : €1.4 billion for projects with a CAPEX above 2.5 million and focusing on component manufacturing for RE energy, energy storage, heat pumps and hydrogen production, pilot projects: €200 million for projects with a CAPEX above 2.5 million and focusing on deep decarbonisation (tech that can reduce relative GHG emissions by at least 75% compared to reference scenario)

Conclusion

Time for an ETS that slashes emissions and transforms industry

As shown by our investigation, there is a pressing need for EU policymakers to bolster the effectiveness of the EU ETS in order to make it work for the climate and for industry transformation. Our findings show that:

- In 2023, big polluters like steel and cement sectors have benefited enormously from free emission allowances, in direct contradiction to the polluter pays principle and with no long-term benefit. They still receive billions to pollute, which is harming both the climate and their competitiveness, as these are billions not invested in their urgently needed transformation.

- A high carbon price and the smooth implementation of the CBAM are necessary elements to guaranteeing a robust Innovation Fund. This fund will help industry to decarbonise and accelerate its transformation, while ensuring it remains globally competitive.

- Since 2020, the Innovation Fund has heavily financed CCS/CCU projects, making the cement sector the top beneficiary of the fund. Despite changes in 2023, the Innovation Fund does not finance enough alternative technologies that enable energy savings. It also does not support enough other innovative and green technologies, such as DRI for steel, and the manufacturing of components, including electrolysers and heat pumps, which are key for industrial decarbonisation.

10 We don't currently have access to the final grant agreements, which were supposed to be signed in Q1 2025. However, we know that for the cement sector, half a billion euros in grants from the Innovation Fund to finance three large-scale projects: CO2LLECT (CEMEX and Linde) is set to receive €157 million in funding; CarbonClear Tech (Lafarge) is set to receive €124 million in funding, and ACCSION (Air Liquide and Cementir Holding Group) is set to receive €220 million in funding.

To change this, a mix of targeted policy improvements is required before and after 2030. EU policy makers should:

1. Ensure the rapid elimination of free allowances for all EU ETS sectors. In the interim, free allowance should only go to companies that demonstrate improvements in energy efficiency and adopt decarbonisation plans (as agreed in the revised ETS Directive in 2022)

2. Require that additional financial support given to ETS sector is conditional on both environmental and social criteria

3. Implement a well-functioning CBAM, with a clear phase-out timeline for free allocation, and gradually expand it to more sectors covered by the EU ETS (starting with petrochemicals and chemical products) and to indirect emissions

4. Fix the scope of the Innovation Fund by recognising raw materials saving as a mandatory criterion for projects applying to the Innovation Fund

Annex

By sectors breakdown for data for 2020 to 2023

Cement & lime

Date	Call for large-scale projects	Total number of projects selected	Number of cement & lime projects	Total amount of euros allocated	Amount of euros allocated to cement & lime projects
2020	1st call	7	1	€1.1 billion	€ 153 386 598
2021	2nd call	17	5	€1.5 billion	€ 777 188 168
2022	3rd call	41	5	€3.8 billion	€ 1000 553 410
2023	4th call	19	3	€4.8 billion	€ 501 000 000

Date	Call for small-scale projects	Total number of projects selected	Number of cement & lime projects	Total amount allocated	Amount allocated to cement & lime projects
2020	1st call	30	0		0
2021	2nd call	16	1	€1.5 billion	€ 4,416,864
2022	3rd call	15	1	€3.8 billion	€ 4,500,000
2023	4th call	8	0	€4.8 billion	0

Chemicals

Date	Call for large-scale projects	Total number of chemicals projects selected	Number of chemicals projects	Total amount allocated	Amount allocated to chemicals projects
2020	1st call	7	1	€1.1 billion	€106,379,783
2021	2nd call	17	2	€1.5 billion	€232,000,000
2022	3rd call	41	6	€3.8 billion	€546,567,595
2023	4th call	19	3	€4.6 billion	Unknown

Date	Call for small-scale projects	Total number of projects selected	Number of steel & iron small scale projects	Total amount allocated	Amount allocated to steel & iron projects
2020	1st call	30	1		€4,386,624
2021	2nd call	16	0		0
2022	3rd call	15	1		€3,978,854
2023	4th call	8	1		Unknown

Steel & iron

Date	Call for large-scale projects	Total number of projects selected	Number of iron & steel projects	Total amount allocated	Amount allocated to iron & steel projects
2020	1st call	7	1	€1.1 billion	€ 143,000,000
2021	2nd call	17	0	€1.5 billion	0
2022	3rd call	41	1	€3.8 billion	€ 250,000,000
2023	4th call	19	2	€4.8 billion	Unknown

Date	Call for large-scale projects	Total number of projects selected	Number of iron & steel projects	Total amount allocated	Amount allocated to iron & steel projects
2020	1st call	30	1	€1.1 billion	€ 2,400,000
2021	2nd call	16	0	€1.5 billion	0
2022	3rd call	15	1	€3.8 billion	€ 4,150,000
2023	4th call	8	2	€4.8 billion	Unknown

Refineries

Date	Call for large-scale projects	Total number of projects selected	Number of refineries projects	Total amount allocated	Amount allocated to refineries projects
2020	1st call	7	0	€1.1 billion	0
2021	2nd call	17	2	€1.5 billion	€155,200,000
2022	3rd call	41	5	€3.8 billion	€450,885,184
2023	4th call	85	2	€4.6 billion	Unknown

Date	Call for small-scale projects	Total number of projects selected	Number of steel & iron small scale projects	Total amount allocated	Amount allocated to steel & iron projects
2020	1st call	30	3		€1,620,000
2021	2nd call	16	3		€12,969,877
2022	3rd call	15	0		0
2023	4th call	8	0		0

Methodology

The first part of the report was developed thanks to two dataset: the first dataset is an update of the Emissions' Aristocracy (Carbon Market Watch, 2023, page 34), connecting EU ETS Transaction Log installations and accounts data with the ORBIS database on company ownership. The second dataset collects sectoral emissions and free allocation data based on EU ETS Transaction Log public data on installations aggregated by NACE codes at level 2, 3 and 4. The NACE codes are inferred based on the leakage assessment of the Commission (Jan Abrell, 2024, page 5). The fraction of emissions where the sector is not known lies between 0-3%.
The second part of the report focusing on the Innovation Fund is based on in-house research conducted using data available on the European Commission website. Projects fiches, outlining the costs of the projects and amount being granted by the Innovation Fund, are publicly available on the Innovation Fund projects webpage (for the year 2020 until 2023) as well as on the Innovation Fund dashboard. While for the year 2020 to 2022, projects fiches are all available it is more complicated for the year 2023. As final grants agreements (between companies and CINEA) are being signed at the time of releasing the report Q1 2025, we don't really know the amounts allocated to certain selected projects.

Special thanks

The authors would like to thank all those who provided valuable input and/or reviewed this report, notably Laurent Millischer, and Joren Verschaeve (ECOS). Within CMW, the report benefited from review and inputs from Sam Van den plas. A special thanks to Gavin Mair, Khaled Diab, Miriam Vicente Marcos and Noemi Rodrigo Sabio for editing, communications and design support. Within WWF, the report benefited from a review and input from Alex Mason, with a special thanks to Florian Cassier and Angelika Pullen for the communications support.

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Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

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