EU ETS 101

A beginner's guide to the EU's Emissions Trading System

EMISSIONS TRADING EXTRA

LIFE ETX

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FURTHER INFORMATION

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EXECUTIVE SUMMARY

The EU Emissions Trading System (EU ETS) is often referred to as a cornerstone of EU climate policy. It aims to reduce emissions by pricing greenhouse gas (GHG) pollution from the power, industry and aviation sectors. It not only seeks to promote investments in emission reductions by making energy-intensive business as usual expensive, but it also offers a great opportunity for the EU to shift funding from polluting activities to climate action, innovation and energy sector modernisation.

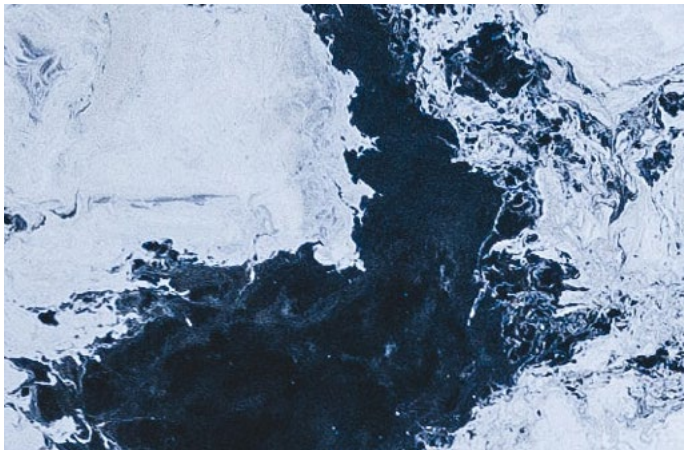
It covers over 10,400 industrial and power installations and approximately 350 airlines, across the 27 EU member states, Iceland, Norway and Liechtenstein (and there is a link with the Swiss ETS).[1]

Historically, it has suffered from credibility issues and low prices on pollution due to a buildup of excess pollution permits in the market. These low prices undermined the core objective of the EU ETS: driving down emissions. However, confidence in the EU ETS has been surging since the most chronic oversupply issues started to be addressed in 2018, leading to more accurate and fairer carbon prices. Nevertheless, these supply issues have only partially been resolved, with the oversupply standing at about 1.6 billion pollution permits in 2020.

The current EU ETS target, to reduce emissions from the sectors it covers by 43% by 2030 (compared with 2005), was already reached by 2020. Overall emissions from EU ETS installations fell by a whopping 11.4% in 2020 alone. Emissions from power and industry saw a 41% decline compared to 2005. This, however, hides differences in emission trends between sectors: emissions from electricity and heat production have fallen by nearly 45% since 2011, while industry emissions hardly decreased: a paltry 1.3% between 2013 and 2019. Emission reductions under the EU ETS are also partially due to other factors and legislation, such as the COVID-19 pandemic, the Renewable Energy Directive and the Energy Efficiency Directive.

These recent positive trends do not mean the EU ETS is a perfect tool. In fact, had it been a truly effective tool the required emission decline would have needed to be much steeper.

The EU ETS suffers from a major problem, notably billions of free emissions allowances that not only undermine the 'polluter pays' principle but also enabled businesses to extract some €50 billion in unearned profits at a time of environmental crisis.



We can draw a number of valuable lessons from the performance and reforms of the EU's Emissions Trading System to make the following recommendations:

Having a carbon market is not an aim in itself. It should be **aligned with EU climate goals and the Paris Agreement 1.5˚C target**, and help ensure that the EU delivers its fair share of climate action.

When demand is low, supply should follow. **Build in mechanisms to address any oversupply in the market**, be it structural or due to unexpected shocks. Letting a large oversupply accumulate over time depresses prices and undermines the polluter pays principle, delaying climate action. The EU ETS currently has approx. 1,6 billion surplus pollution permits. This oversupply has been addressed since 2018 by the Market Stability Reserve, but too slowly, especially considering that additional sources of oversupply loom on the horizon, such as the German coal and lignite phase out.

Don't undermine the polluter pays principle by granting free pollution permits, allowing for the use of international offset credits or finding ways to subsidise polluters through the backdoor. Free allocation of pollution allowances under the EU ETS has caused emissions from industrial sectors to remain stagnant or decrease very slowly, while aviation emissions are still skyrocketing, if we exclude the temporary effects of the COVID-19 pandemic.

Revenues from selling pollution permits should all be invested in climate action and in supporting a just transition to a climate-neutral society and economy. In the EU, that is currently not the case at all.

These are lessons the EU ETS has learned the hard way: trial, error and political horse trading. The ongoing process to revise the EU ETS is, once again, a critical one: it gives us the chance to correct the remaining flaws in the system and bring it in line with what the climate breakdown demands - while resisting forces that seek to weaken it.

This beginner's guide to the EU ETS aims to build knowledge and understanding of Europe's carbon market for civil society organisations who have little or no prior experience with EU climate policies, especially in countries in the EU neighbourhood. It provides introductory knowledge on how the EU ETS is designed and how it functions. Increased awareness should ultimately empower civil society to get involved in the ETS process and advocate for an effective and fair European carbon market.

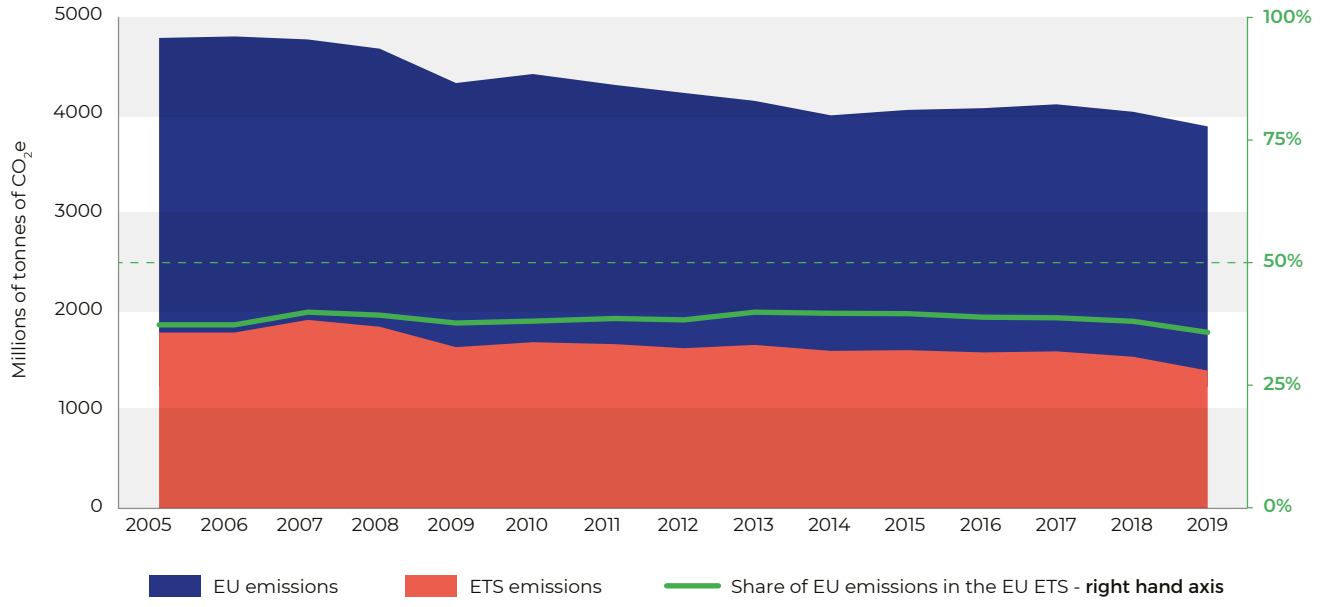
January 2022

WHAT IS THE EU ETS?

The European Union's Emissions Trading System (EU ETS) is one of the main tools with which the EU hopes to combat global heating and reduce greenhouse gas (GHG) emissions cost effectively.

- It is a regulatory market, meaning it has been created by policymakers instead of just being the result of market forces.
- The main legislation setting out the Emissions Trading System's governance and functioning is the EU ETS Directive, which aims to set in motion "cost-effective and economically efficient" and "scientifically necessary to avoid dangerous climate change".
- The EU ETS is meant to apply the 'polluter pays principle', meaning that the costs of pollution should be borne by those who create it.
- Launched in 2005, the EU ETS is the oldest emissions trading scheme in the world. It was also the largest until 2021 when the Chinese ETS kicked off.
- In 2021, the EU ETS covered over 10,400 industrial plants and power stations, as well as approximately 350 airlines, across the 27 EU member states, Iceland, Norway and Liechtenstein (there is also a link with the Swiss ETS, and power plants in Northern Ireland are covered even after Brexit).
- In 2013, the EU ETS covered approximately half of all EU's GHG emissions. That dropped to 36% in 2020 because EU ETS sectors, in combination, are reducing their emissions faster than the rest of the economy.

Figure 1: EU ETS and EU emissions

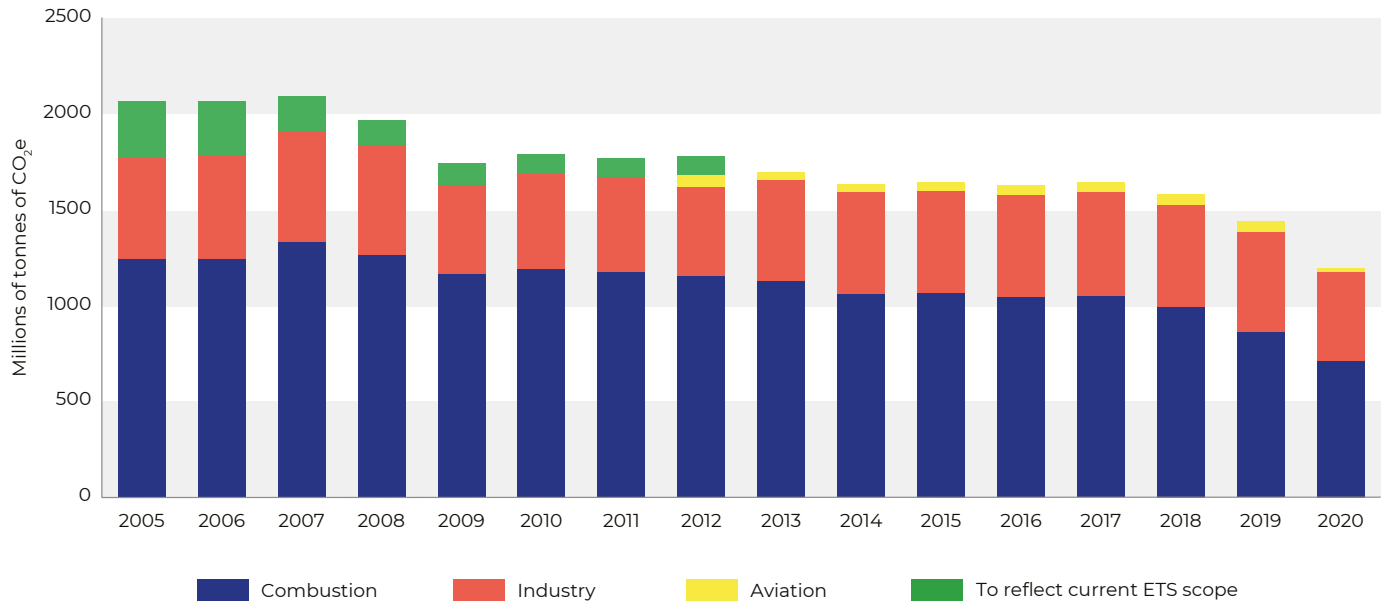


CAP AND TRADE

The EU ETS is a 'cap and trade' system. This means that it sets an overall limit (a 'cap') on the total volume of greenhouse gas (GHG) emissions that installations in the covered sectors can cumulatively emit. The reduction targets set for the EU ETS sectors by EU policymakers are achieved through the gradual lowering of this cap.

The key sectors in the EU ETS are the electricity sector, heavy industry[2] and aviation. The ETS deals with six greenhouse gases, though not in every sector covered.[3] For example, CO_2 from power and heat generation, flights and many energy-intensive industries is included, but only perfluorocarbons (PFCs) from the production of aluminium are included.

Figure 2: Sectoral emissions



The cap is divided into pollution permits known as EU Allowances (EUAs). One EUA represents one tonne of CO_2 equivalent emissions. In 2021, the cap was approximately 1.57 billion EUAs. Installations covered by the EU ETS are obliged to annually hand over (also known as surrender) EUAs equal to their emissions the previous year. For example, an installation that emitted 1 million tonnes of CO_2 in 2020 would need to transfer 1 million EUAs to the European Commission's central registry in 2021.

Companies can acquire these EUAs through three main channels:

- Buy them at auction: auctions are organised by the European Energy Exchange, with the revenues going directly to the EU's 27 member states according to a predefined division key.
- Receive them for free: sectors deemed to be at the risk of carbon leakage,[4] the aviation sector, and for electricity production in some lower-income member states receive free allocations
- Buy them on the open (or so-called secondary) market: there are several trading platforms where ETS operators (or others such as financial institutions) can trade allowances between each other. Transfers of EUAs can also be included in other contracts (for example for the purchase of heat or electricity)

Companies can buy and sell allowances, including those they received for free, on the open market and trade them with each other. This is what the 'trade' part in 'cap and trade' refers to. For example, if a company has succeeded in lowering its emissions particularly fast, it can sell its spare allowances to another company or save them for future needs - this is called 'banking allowances'. This trading element is the part of the EU ETS that should, in theory, enable cost-efficient decarbonisation, meaning that the cheapest emission reductions take place first. However, a carbon market on its own is not fit to address non-market barriers (for example, lack of capital to invest in energy savings) or to help develop innovative clean breakthrough technologies.

The overall cap is enforced through limiting the supply of EUAs: each year only as many EUAs are made available through auctions and free allocations for companies as the cap for that year. The cap is reduced each year, to ensure GHG emission from the involved sectors decrease as well. Companies in the ETS are aware of this reality. They understand that, in theory, this means that EUAs will become increasingly scarce and costly over time, even if this was not the case in the early years after the system was introduced. The cost of acquiring an EUA now and in the future gives companies, in principle, a financial incentive to reduce emissions. Either these companies continue to pay for high continued emissions, or they invest in technologies and projects to reduce their emissions and thereby the amount of EUAs they need.

COOKING THE BOOKS

Companies have to comply with the obligation to accurately measure and report their emissions, and to surrender the appropriate number of allowances. For each tonne of emissions they fail to report and surrender an EUA for, they must pay a €100 fine on top of the EUA they must hand over.

By and large this has not been an issue, though some crimes related to the EU ETS have been committed. Criminal networks undertook value-added tax (VAT) fraud valued at €5 billion in the early years of the EU ETS, and by 2010 over 100 people had been arrested. The VAT fraud involved buying carbon permits in another country (free of VAT) and selling them on with VAT, but without transferring the VAT to the relevant tax authority.

More recently, in 2021, journalists uncovered that Hristo Kovachki, a Bulgarian coal magnate, had significantly underreported the emissions from two power stations from 2018 to 2020. Unlike the VAT fraud this does have a direct environmental impact as, if proven true, GHG emissions will not have been counted nor subjected to the polluters pays principle. In total, the two plants appear to have underreported between 1 and 1.5 million tonnes of CO_2 emissions - and avoided paying a sum of between €26.6 and €32.2 million euros, depriving member states of EU ETS revenues.

LOWER CEILING, HIGHER AMBITION

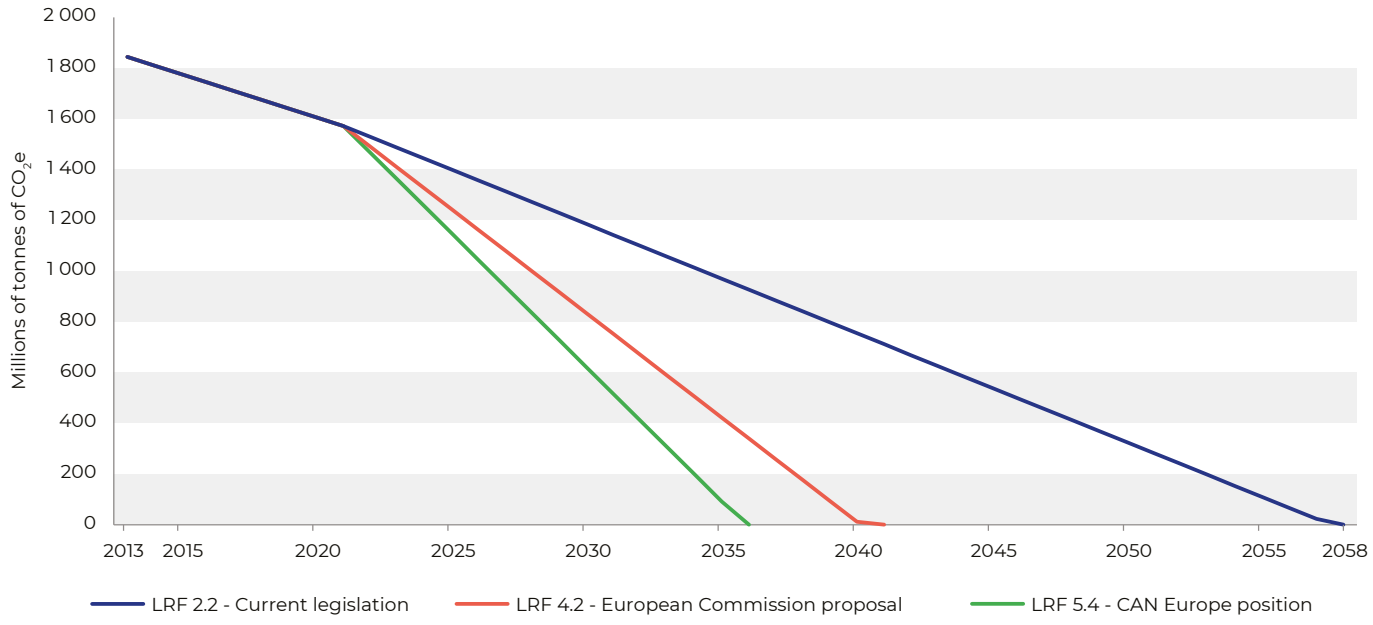
The cap decreases by a fixed amount each year, which is calculated using the so-called linear reduction factor (LRF). The LRF is expressed as a percentage of the 2013 total cap. For 2013 to 2020, the LRF was set at 1.74% (about 34 million EUAs a year), and starting in 2021 it is set at 2.2% (about 43 million EUAs a year).

There is a direct correlation between the LRF and climate ambition: the higher the LRF, the lower the emissions. Unsurprisingly, the size of this factor has become a central issue in negotiations around reforming the EU ETS. The European Commission has proposed to increase the LRF to 4.2% as of 2024. While this is an improvement, it does not go far enough and Climate Action Network Europe (CAN Europe - an umbrella organisation representing NGOs working on climate change in Europe) states that it should be 5.4%.

The impact of the various heights of the LRF on the EU ETS cap[5] can be seen in the graph and table below. The current LRF of 2.2% (blue line) is compared to the European Commission's proposal of July 2021 (red line) and the LRF of 5.4% proposed by CAN Europe. This higher LRF is necessary to reduce the size of the Emissions Trading System by 70% by 2030 against 2005 levels (yellow line).

The more ambitious target proposed by activists would drastically lower the total emissions still available through the EU ETS, to just under 11 billion tonnes, compared with 14.3 billion tonnes under the Commission's proposal and a whopping 28 billion tonnes if the current status quo were to continue. In addition, the CAN Europe proposal would also bring the ETS to zero by 2036, more than two decades ahead of the status quo and five years earlier than the Commission's proposal.

Figure 3: the impact of the LRF on the stationairy EU ETS cap trajectory



Note that the cap for 2013-2020 is a simplified retroactive calculation from the 2021 cap to take Brexit into account, using the actual LRF for that period (1,74%).
Source: Carbon Market Watch calculations based on European Commission data

Table 1: the impact of the LRF on the total EU ETS emission budget

	Cumulative emissions from 2021 onwards, in millions of tonnes of CO_2e	Year that the EU ETS cap reaches zero
LRF 2,2 Current legislation	27,937	2058
LRF 4,2 European Commission proposal	14,262	2041
LRF 5,4 CAN Europe position	10,900	2036

Table 1 shows the impact of increasing the LRF in 2021, utilising the same three LRFs as in Figure 3.

So while the LRF may appear small, it is crucially important for the functioning and ambition of the EU ETS. It sets the supply of EUAs, determines the available decarbonisation pathways and the total carbon budget. This means that the LRF has a massive impact on the environmental integrity of the ETS and the behaviour of the companies governed by it.

CARBON CAP OR CARBON TAX?

The European Union initially planned to reduce greenhouse gas emissions by establishing a carbon tax. In 1992, the Commission made a proposal for a combined carbon and energy tax. Under the Treaty of the European Union, this move required the unanimous agreement of all EU member states (12 at the time). This failed and after almost a decade of difficult negotiations the carbon tax approach was abandoned.

The European debate on carbon pricing instruments then shifted from taxation to capping and trading emissions. The mantra of 'cost efficiency' took centre stage and, vitally, possible legislation for emissions trading at EU level would require decisions through qualified majority voting by member states instead of the unanimity required for fiscal measures like a carbon tax.

Placed against this backdrop, the eventual decision to establish a carbon market in the form of the Emissions Trading System was more a way to overcome the political and institutional stalemate that had blocked progress on EU-level carbon and energy taxation.

However, the idea of taxing emissions is enjoying a revival in the form of the proposed Carbon Border Adjustment Mechanism, which is designed to tax the emissions embedded in imports into the EU.

A BRIEF HISTORY OF THE EU ETS

The EU's Emissions Trading System is a regulatory market, which means that policymakers not only established it but also decide on how it is run and how it changes over time. The three main EU institutions (European Commission, European Parliament and Council of the European Union) are involved in any major modifications to the scheme, such as the ongoing 'Fit For 55' reform package that started in the summer of 2021.

This revision seeks to bring the EU ETS in line with the increased European Green Deal target of reducing emissions in the European Union by 55% (up from 40%) by 2030 compared to 1990. This current revision is critical because it will set the pace and scope of the EU ETS for the 2020s, a make-or-break decade for humanity to rein in its GHG emissions. The Fit for 55 revision package contains 15 legislative files, including the ETS and other existing laws, as well as some new ones, such as the Carbon Border Adjustment Mechanism.

Although modifying the ETS requires interinstitutional negotiations (known as trilogues at the end of the so-called 'ordinary legislative procedure') between the three EU institutions, the European Commission is responsible for running and enforcing the EU ETS - especially setting technical variables. The Commission is also required to report to member states, the European Parliament and (sometimes) the public on a variety of issues, including producing an annual report on the functioning of the EU ETS and reporting on how international negotiations relevant to the EU ETS develop.

EVOLVING WITH THE TIMES

The EU ETS has changed significantly since its launch in 2005. It has gone through three phases, and the fourth phase kicked off in 2021.

Phase 1 (2005-2007) was a pilot phase which built and tested the infrastructure needed to run an ETS. It also gave businesses time to understand the system. During this phase nearly all allowances were handed out for free.

The EU cap was set by summing up the separate national caps set by each of the member states (with European Commission oversight), which were called National Allocation Plans (NAPs). These early NAPs were extremely problematic. They were based on conservative emissions estimates and allocated most allowances for free or based on coal benchmarks for the power sector, thereby incentivising the most polluting technology. Moreover, a large supply of international offset credits could be used to comply without quality criteria for projects.

Absurdly, the resulting cap was so large that the total number of allowances issued actually exceeded the emissions of the covered sectors in 2006. Unsurprisingly, this caused the price of allowances to fall to zero. Fortunately, this oversupply was a temporary issue because Phase 1 credits could not be transferred over to Phase 2.

Phase 2 (2008-2012) continued the use of NAPs, but this time the overall cap was reduced and based on actual emissions data from Phase 1. Around 90% of all emissions under the EU ETS were still handed out for free, but the first auctions were held. International offsets were still allowed onto the market, and over 1 billion of these credits would enter the EU ETS by 2012. These international credits, an overgenerous cap and the effects of the financial crisis (when less economic output depressed emissions but the supply of EUAs not being adjusted) led to an enormous oversupply (reaching nearly 2.1 billion units in 2014).

This held EUA prices down until the Market Stability Reserve (MSR) started operating in 2018. The MSR is a supply control mechanism that can limit the number of EUAs in circulation on the EU ETS market. It is covered in detail later in the paper.

TOO MUCH CREDIT

Before 2021, the EU ETS allowed the use of international credits created by climate change mitigation projects established under the United Nations Framework Convention on Climate Change. These so-called 'international offsetting credits' were generated through two mechanisms set up under the Kyoto Protocol: the Clean Development Mechanism (CDM) and Joint Implementation (JI). This exception was scaled down over time and eventually stopped. This means that the EU's current emissions reduction target for 2030 is exclusively domestic and excludes the use of international credits.

The use of Kyoto credits hampered the functioning of the EU ETS by inflating the oversupply of emission allowances, thereby lowering the incentive for European industry to decarbonise. In addition, confidence in the climate benefits of these often cheap credits plummeted due to their lack of environmental integrity and the harm some of these projects caused local and indigenous communities.

Between 2013 and 2020, quantitative and qualitative limits were put in place on the credits that could be used under the EU ETS. For example, nuclear energy projects and forestry projects were not allowed. Moreover, only credits from eligible projects created after 2012 were allowed, except for projects in least-developed countries. Some 96% of the maximum possible international credits were used for compliance under the EU ETS system, which amounted to about 1.6 billion units by the end of 2020. The vast majority of international offset credits came from projects in a small group of countries. Over 422 million units came from projects in China, 212 million from Ukraine, 130 million from Russia and 108 million from India.

At the start of Phase 3 (2013-2020), the EU ETS was changed considerably, building upon the experiences and mistakes from the first two phases. A single, EU-wide cap on emissions was established instead of the previous system of national caps defined in NAPs. Auctioning became the default method for allocating EUAs, and the electricity sector did not receive any free allowances anymore, except limited quantities in some member states to support the modernisation of their power sectors (see box below). More sectors and greenhouse gases were included, as well as harmonised allocation rules applying to the allowances still given away for free.

International credits were still permitted but in far smaller quantities (around 500 million in Phase 3 compared with over a billion in Phase 2). These international credits had to be exchanged for EUAs and so no longer added to the oversupply. However, they continued to undermine the carbon price on the ETS and led to windfall profits for numerous companies as they were significantly cheaper than EUAs (which is discussed in depth later in this paper under the heading 'Money for nothing').

ELECTRIFYING EXCEPTIONS

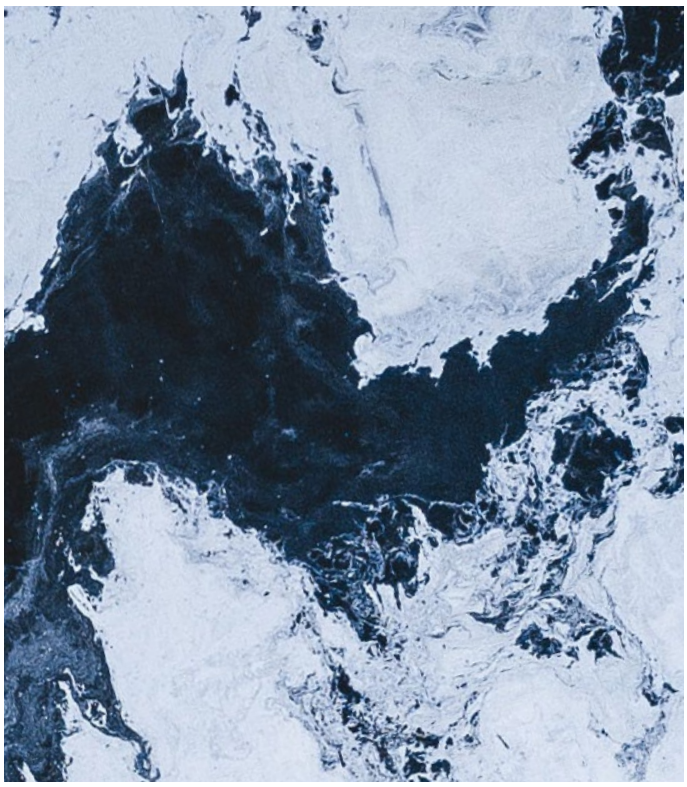
One of the major changes introduced in Phase 3 is that power plants stopped receiving free allocations and had to pay the EU ETS carbon price for their pollution. However, there was one notable exception. Lower income member states can provide limited amounts of free permits to power plants to support investments in diversification of the energy mix, restructuring, environmental upgrading or retrofitting, clean technologies or modernisation of the energy production sector and of the transmission and distribution sector. The projects selected for funding "cannot contribute to or improve the financial viability of highly emission-intensive electricity generation or increase dependency on emission-intensive fossil fuels" (Article 10c of the EU ETS Directive). A maximum of 40% of all EUAs a member state is entitled to auction may be used for this scheme. Any allowances used by a member state for this mechanism are deducted from that member state's auctioning quantity.

For the 2021 to 2030 period, 10 member states are eligible, but only three currently make use of this rule: Bulgaria, Hungary and Romania.[6] The other eligible member states have either shifted these allowances to the Modernisation Fund or have added them to their auctions. These three countries can freely allocate nearly 78 million EUAs over this period through this mechanism (out of a total of nearly 640 million that were available to all 10 eligible member states).

In 2015, the Market Stability Reserve (MSR) was created to address the structural oversupply in the market: 900 million EUAs that had been 'backloaded' (i.e. pushed back on the auctioning calendar) earlier in Phase 3 were placed in it. The MSR started actively sucking surplus EUAs out of the market in 2018, and ended a period of very low confidence (and prices) in the ETS.

Phase 4 only started in 2021, shortly after the EU ETS was adapted heavily. The MSR has been strengthened and will also cancel EUAs above a certain threshold. However, free allocation will still cover some 90% of industrial emissions. The Innovation[7] and Modernization Funds were created to invest (respectively) in low-carbon innovation, and energy sector modernisation and a just transition.

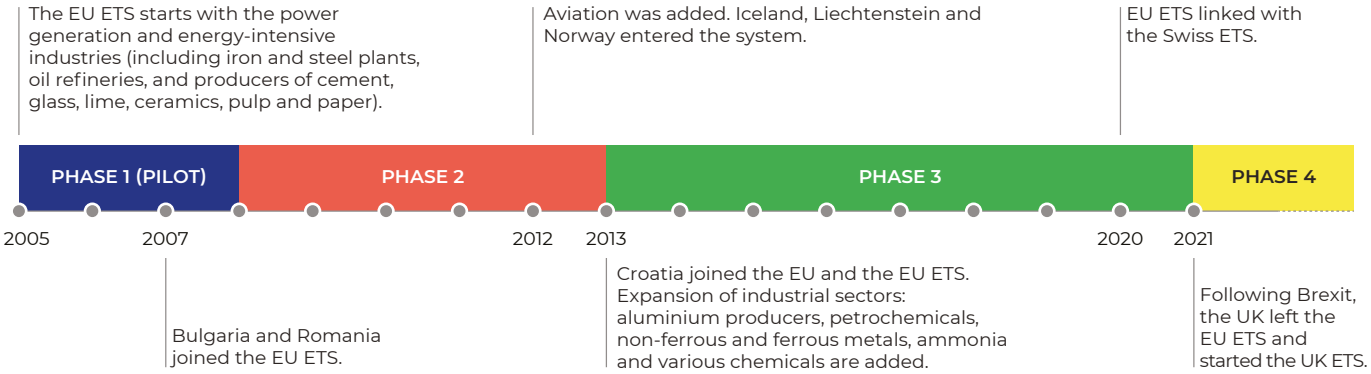
Despite the short time that has elapsed, all these Phase 4 changes are back on the negotiating table due to the ongoing revision of the EU ETS. Starting in 2023 or 2024 (depending on the length of the negotiations), the ETS could again be a very different animal.



THE CHANGING FACE OF THE EU ETS

The scope of the EU ETS has changed over time, with economic sectors being added and countries entering or leaving the system.

Figure 4: Main changes to the coverage of the EU ETS



The current revision will most likely lead to maritime transport entering the EU ETS - likely both intra-EU shipping and (a part of) voyages to EU ports from third countries and vice versa.

The European maritime sector is a large source of climate pollution – responsible for 144 Mt of CO_2e emissions in the EU in 2019.

The inclusion of the aviation sector in the EU ETS was first proposed in 2008, with the objective of pricing emissions from all flights within the European Union, as well as flights to and from the EU (i.e. with either the departure or arrival airport located in an EU member state). This quickly sparked a political row as non-EU countries, led by the United States which is home to aviation powerhouse Boeing, engaged in a diplomatic battle to stop this.

When aviation was finally brought under the ETS in 2012, only flights within the European Union and the European Economic Area (EEA) were covered. Long-haul flights will continue to be exempted from EU ETS obligations until 2023, and a new proposal from the Commission might extend the exclusion of such flights beyond this date (the "clock was stopped" repeatedly on bringing international aviation into the EU ETS). This leaves over 50% of the EU's aviation-related emissions uncovered, as the majority of most EU airlines' emissions are from long-haul flights that are not covered by the EU ETS. Following the linking between the EU ETS and the Swiss ETS, as well as the Brexit deal, flights from EEA countries to Switzerland or the UK are also covered under the ETS (flights from those countries to EEA countries are covered by the respective national ETS).

In 2016, ICAO, the UN's aviation agency, agreed on an international carbon offsetting scheme, known as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), to compensate for the growth in CO_2 from international flights. Despite this scheme being very weak and relying on compensation instead of in-sector reductions, the European Commission proposed to implement CORSIA to cover flights not currently covered by the EU ETS. This would replace the currently planned scope extension scheduled for 2023. From an environmental perspective, this amounts to backsliding compared to the current EU ETS rules. Flights between and within EEA member states would remain covered by the EU ETS.

WHAT HAS THE EU ETS EVER DONE FOR THE CLIMATE?

The stated aim of the EU's Emissions Trading System is to push cost-effective decarbonisation across key sectors of the EU economy. This implies that the EU ETS should complement the EU's climate actions by reducing emissions from covered sectors to a level that is in line with the Union's climate goals. At the end of 2021, the EU ETS was required to decrease the combined emissions of all covered installations by 43%, relative to 2005, by 2030. This target was already reached by the end of 2020, indicating that this was not an ambitious climate target. The falling cap will reach zero by 2058, implicitly setting a longer term pathway for full decarbonisation.

The European Green Deal and the Climate Law raised the EU's climate ambition, with the EU economy-wide emissions reduction target increased to at least 55% from the previous 'at least 40%' (both compared to 1990). This higher ambition needs to be translated into sectoral targets. In July 2021, the European Commission proposed to raise the EU ETS target to a 61% reduction in emissions by 2030 (compared with 2005).

While these higher targets are a step in the right direction, they do not go far enough. Environmental NGOs are demanding that the EU ETS should aim to slash emissions by 70% by 2030, and that the EU should reach climate neutrality a decade ahead of the current official target by 2040 at the latest to stand a chance of keeping global warming below the crucial 1.5°C threshold and shoulder its fair share of climate action.

But is the EU ETS actually succeeding in its bid to decarbonize the sectors it covers?

IS THE EU ETS REDUCING EMISSIONS?

Total emissions under the EU ETS have fallen considerably. Figure 2 shows how EU ETS total emissions have evolved during Phase 3 (2013-2020). Notice also they have been significantly under the cap over the entire third Phase, so much so that the 40% reduction target for 2030 was already reached in 2020, a full decade ahead of schedule. This is the result, however, not of an abundance of success but of a shortage of ambition.

Figure 5: EU ETS emissions vs. the cap

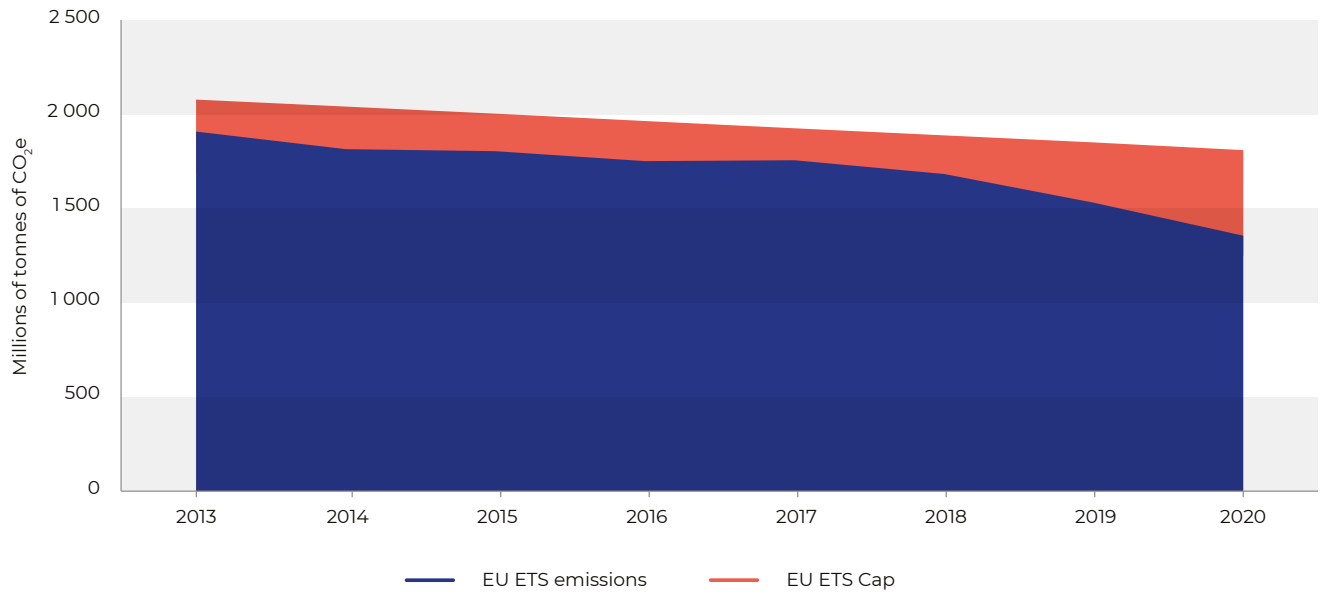


Table 2: Yearly changes in EU ETS emissions

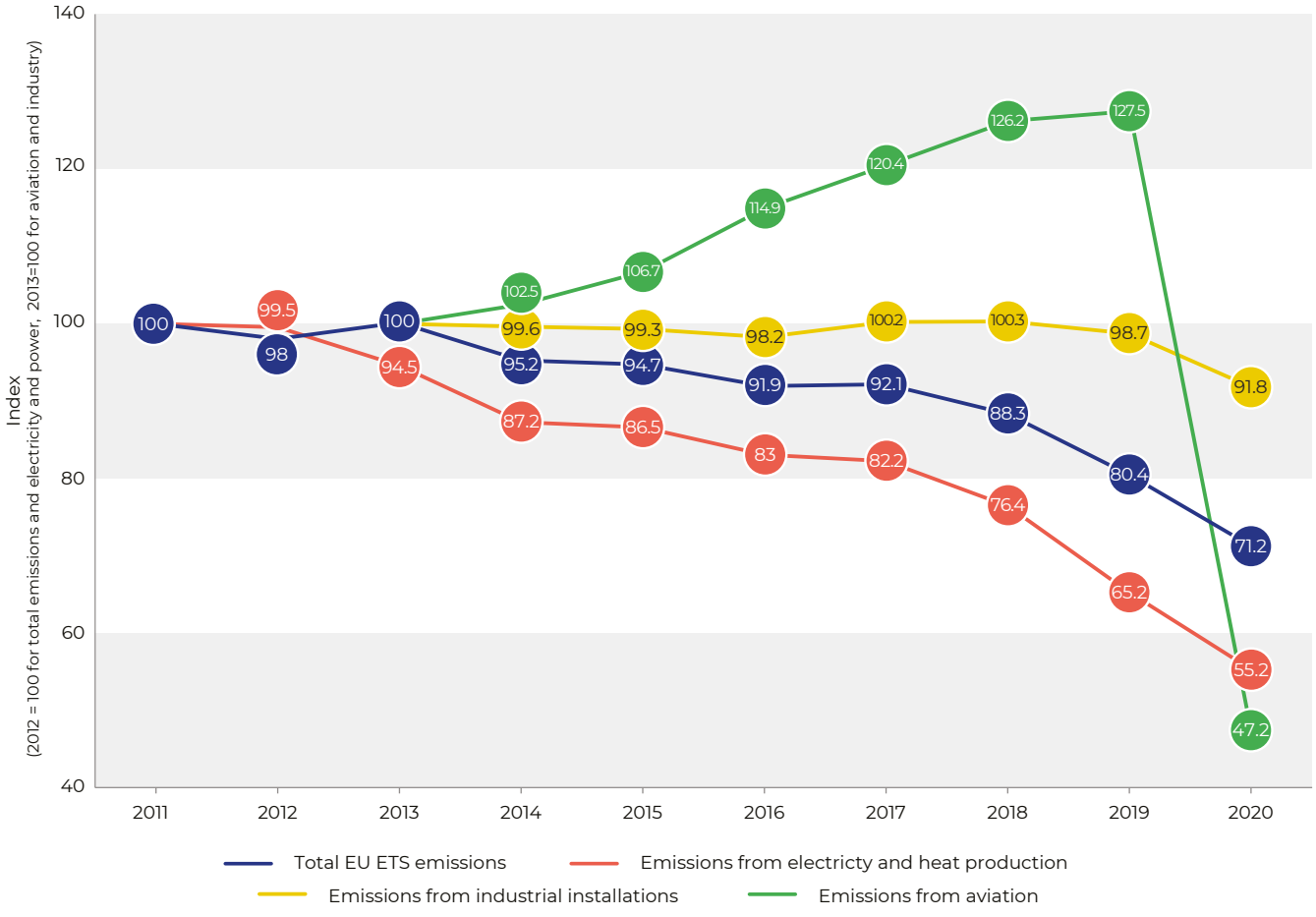
2012	2013	2014	2015	2016	2017	2018	2019	2020
-1.94%	2.20%	-4.93%	-0.61%	-2.88%	0.23%	-4.10%	-9.09%	-11.44%

Source: European Commission (2021), 'Report on the Functioning of the European Carbon Market in 2020'

Moreover, the total reduction in emissions camouflages major differences between sectors. Utilities (electricity and heating) are the key reason why EU ETS emissions have decreased over time. However, industrial emissions have been more or less stagnant since 2013 while aviation emissions have increased (with the notable exception of 2020 when the COVID-19 pandemic resulted in a temporary drop for aviation and industry). The main cause of this discrepancy is that the power sector has had to pay for the vast majority of its allowances since 2013,[8] while aviation and industry still receive massive amounts of units for free, resulting in no strong economic incentive for them to decarbonise their operations.

Figure 3 uses indices to highlight the differences in sectoral emission trends.

Figure 6: Sectoral emission trends



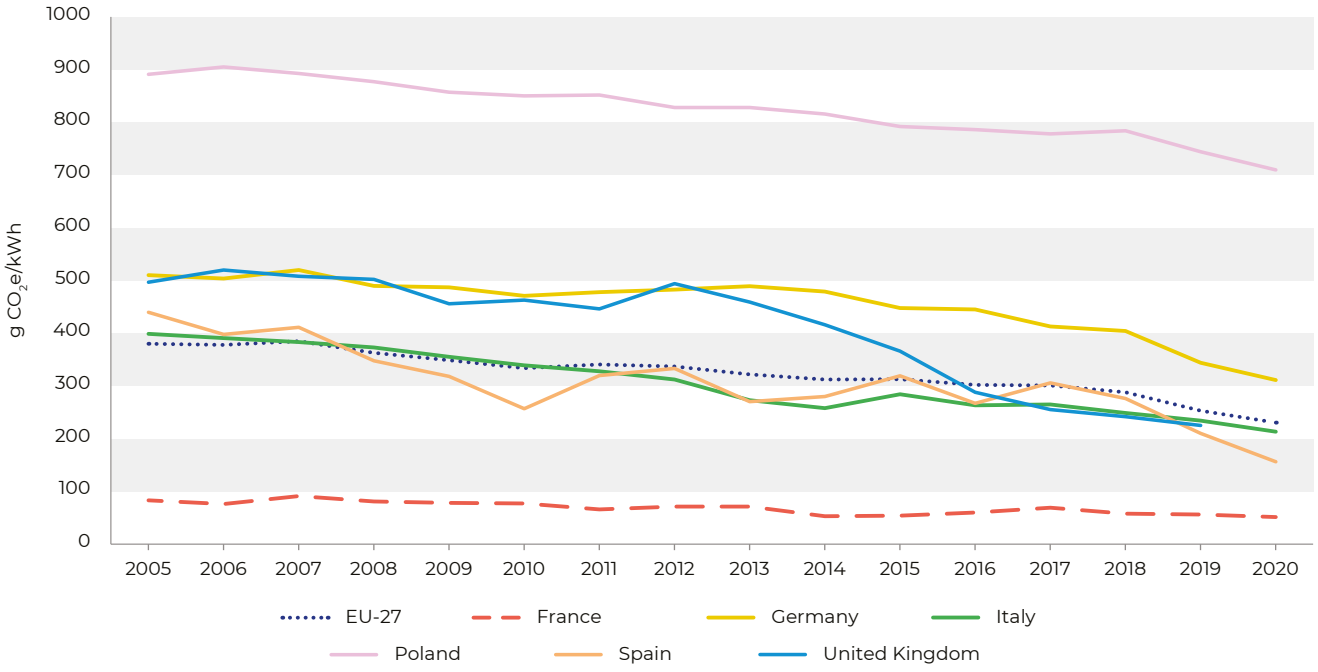
Source: European Commission (2021), 'Report on the Functioning of the European Carbon Market in 2020'

Note: aviation and industry emissions are only shown starting in 2013 when the EU ETS expanded to cover aviation and a greater number of industrial sectors. The drop in aviation and industrial emissions in 2020 is due to the temporary economic slowdown caused by the pandemic.

THE UTILITY OF PAYING FOR POLLUTION

Emissions from electricity and heat production have dropped sharply over the past decade, by nearly 45% since 2011. A key factor underpinning this evolution is the declining quantity of greenhouse emissions required to produce a unit of electricity, which is known as the carbon intensity of electricity production. Figure 4 shows that the carbon intensity of electricity production has decreased steadily since the inception of the EU ETS in 2005, especially in Germany, the UK and Poland, where electricity became relatively cleaner.

Figure 7: Greenhouse gas intensity of electricity production in the EU and selected larger member states (+UK)



Source: EEA (2021, 'Greenhouse gas emission intensity of electricity generation in Europe'

But how much of this is due to the EU ETS, and how much due to other factors?

The EU ETS is not the only policy driver affecting the decarbonisation of electricity production. A 2020 study showed that, between 2005 and 2018, the lion's share of the decrease in emissions from the power sector was due to renewable energy deployment across the EU. The authors noted that the EU ETS did play a role in spurring the transition towards renewable energy, but it was definitely not the main driver. By 2020 that picture had started to change, as energy market data suggest higher carbon prices caused a switch from that dirtiest of fossil fuels, coal, to less dirty gas. Other key drivers of the decarbonisation of the EU power sector include the Energy Efficiency Directive, which has helped tame the demand for energy, the Industrial Emission Directive, which as helped limit non-CO_2 air pollutants, and national plans for phasing out coal and lignite in the power mix.

A key lesson can be drawn from this. It is clear that the cost of allowances has not always been sufficient to spur a switch to renewables or less polluting fossil fuels, nor to make coal power plants durably unprofitable. Since 2019, rising carbon prices have had a marked impact on the profitability of coal power plants across the EU. This highlights the fact that carbon prices on their own may not be sufficient and that complementary policies and measures are necessary to truly incentivise decarbonising the power sector.

Note that the EU also imports electricity from neighbouring countries such as Bosnia and Herzegovina and Serbia, including coal-based power that is not included in the numbers and graphs above. The plants in question do not adhere to EU pollution control rules[9] nor do they pay a carbon price.[10] From 2018 to 2020, the Western Balkans exported 25 TWh of electricity into the EU (approximately 0.3% of EU electricity use), amounting to 8% of the total coal-fired power generation in the Western Balkans.

HEAVY INDUSTRY'S EMISSIONS GRAVY TRAIN

Industrial emissions barely decreased between 2013 and 2019, declining by a paltry 1.3% over that entire period. The main difference between how the EU ETS impacts power and industry is that while the power sector has to buy allowances (at auction or through the secondary market), the industry sector is still receiving most of the EUA it needs for free. More than 95% of industrial climate pollution is emitted at no cost to industry, but at enormous cost to the environment and society, due to energy-intensive industrial sectors being considered at risk of carbon leakage (see sections on Money for nothing and Carbon leakage protection).

With virtually no market incentive, most energy-intensive industries are not strongly committed to investing in cleaner technologies and making the necessary changes to decarbonise. In fact, the current long-term roadmaps presented by the industries themselves, if taken together, represent a mere 18% reduction of greenhouse gas emissions between 2016 and 2050. However, decarbonising energy-intensive industries is possible and a plethora of solutions have already been identified. These include increasing energy savings, scaling up renewable energy deployment and applying circular economy models that, if fully adopted, can put Europe's heavy industry on a pathway that is compatible with the goals of the Paris Agreement.

Under current legislation, the EU ETS would hand out up to 6.5 billion additional free emission allowances with a market value of about €325 billion between 2021 and 2030 (at EUA prices of €50).[11] This would drop slightly to 5 billion allowances, worth €250 billion, under the European Commission's Fit for 55 package. This pollution subsidy undermines the EU ETS goal of incentivising the reduction of industrial emissions, including from steel, chemical and cement plants, as well as oil refineries.

AVIATION'S SKYROCKETING EMISSIONS

In the aviation sector, growth in demand has outpaced increasing efficiency, which means that absolute emissions from this sector continue to rise. Emissions per passenger per kilometre are decreasing slightly every year, but this is of little benefit to the climate when more and more passengers take to the skies. The aviation sector is the only ETS-covered sector where emissions have been consistently increasing. While this trend was interrupted by the COVID-19 crisis, which grounded most planes, it is likely to be temporary and nearly all forecasts predict renewed growth in emissions by approximately 2025.

Some of the medium- to long-term emission reduction opportunities include more efficient and lighter planes, reorganising flight paths and times, and switching from fossil kerosene to alternative sustainable fuels such as green hydrogen or fuels based on renewable electricity (so-called e-fuels). However, all of these measures are only marginal and/or are only at an early stage of development. In the short term, flying less is the only realistic option for reducing aviation emissions. Free allocations to the aviation sector undermine efforts to reduce supply and demand and the urgency to invest in a real zero-carbon transition sooner rather than later.

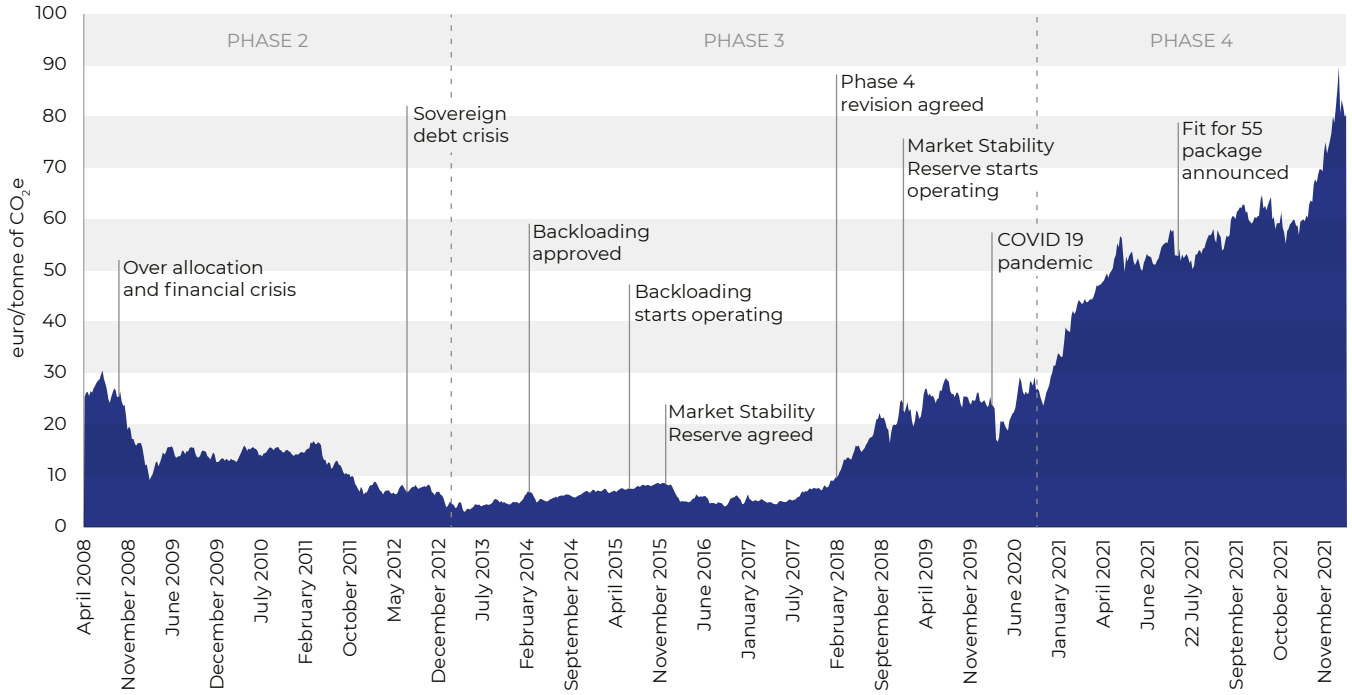
Finally, it is important to note that only the carbon dioxide emissions from aviation are included in the EU ETS. But this only represents a portion of the total climate impact of the sector. So-called non-CO_2 impacts, such as nitrogen oxides and contrails, have an effect that is estimated to be around twice the size of that of CO_2. While carbon dioxide stays in the atmosphere for at least centuries, most of the non-CO_2 impact would rapidly disappear if planes were grounded today.

THE PRICE OF POLLUTION

The EU ETS is meant to maintain the polluter pays principle, by requiring climate polluters to purchase and surrender pollution permits (so-called EUAs). The carbon price represents a direct incentive to invest in emissions reductions, and it acts as a bellwether for confidence in political willingness to engage in climate action. A specific emission reduction technology, practice, investment or alternative low/no-carbon products might only become commercially competitive if the carbon price is sufficiently high.

The carbon price is determined by what companies are willing to pay for EUAs at auction or on the secondary market. The price of allowances in the EU has had a troubled history, staying at damagingly low levels for almost a decade after the financial downturn in 2009, due to oversupply and free credits. It is only recently that the EU ETS reached a more meaningful pollution price which has the potential to shift the fuel mix in the power sector (see above), even if it is still far below the cost of the damage inflicted by a tonne of CO_2 emissions (€180 euros per tonne according to the German Environment Agency).

Figure 8: EU carbon prices since the start of Phase 2



Source: own elaboration on Sandbag (2021), 'Sandbag Carbon Price Viewer'

Note: this excludes Phase 1 2005-2007 as it was a pilot phase.

MONEY FOR NOTHING

Rather than making the polluter pay, the EU's Emissions Trading System has too often paid the polluters and rewarded destructive behaviour. Free allocation has led to numerous companies profiting from the EU ETS to the tune of up to €50 billion between 2008 and 2019, according to research commissioned by Carbon Market Watch. Iron and steel, cement, petrochemicals and refineries made the biggest gains, while most of these windfall profits[12] were generated in Germany, the United Kingdom, France, Italy and Spain.

There are three main sources for these profits:

1. Surplus of free allowances

Between 2008 and 2012, industrial sectors received far more emission allowances for free than they actually needed. They were able to sell their surplus on the market, generating a profit of more than €8 billion over that period.

Since 2013, the ETS rules slightly reduced the amount of free allocation to industry, and the over-allocation ceased to generate such large profits for certain sectors. The relative shortage of free allowances is larger for refineries, while cement manufacturers are still receiving too many free pollution permits.

All in all, just 37% of industrial installations did not receive enough allowances for free over the period 2008 and 2019 to cover their actual emissions. This means that almost two-thirds (63%) of industrial installations did not have to pay a single euro for their emission allowances over that decade. That means that the ETS, at best, had no effect on them and, at worst, made them a profit.

2. Cheaper international offsets

Until 2011, companies could use cheaper international offset credits[13] instead of EU ETS allowances to cover their emissions. These credits were much cheaper than EUAs, so companies used them for compliance, while selling the free EUAs they received on the market for profit.

Since 2012, quantitative and qualitative limits have governed the use of international credits under the EU ETS. This led to the halving of the use of international credits over double the period, dropping to 500 million between 2012 and 2020 compared with over 1 billion from 2008 to 2012.

Despite the drop in volume, the profitability of these exchanges remained high for industry. The new rules that came into force in 2012 stipulated that while international credits could not be used directly for compliance under the EU ETS, some could be exchanged for EUAs. This allowed companies to exchange a cheap international credit for a more expensive EUA, thereby making additional profits. Between 2008 and 2012, 201 million allowances were used for international credit conversions, while for the 2013-2019 period, the amount was about 230 million allowances. All in all, these conversions led to €3 billion of windfall profits.

Since 2021, this avenue has been closed off.

3. Making the customer pay for free allowances

Finally, industry still passes on (at least some of) their hypothetical EU ETS cost to their customers,[14] even though they receive nearly all the EUAs they need through free allocations.[15] The resale value of these free allowances on the secondary market tends to be reflected in the prices of products, as not using an EUA means it can be sold.

Moreover, when firms integrate the hypothetical ETS cost into their prices, the general price level of products in the same market rises. This means that even producers who did not intentionally pass through the costs are implicitly profiting from higher product prices.

In effect, this double charging has led to a perverse situation in which both taxpayers and customers (many of whom are the same people) are subsidising industrial pollution,

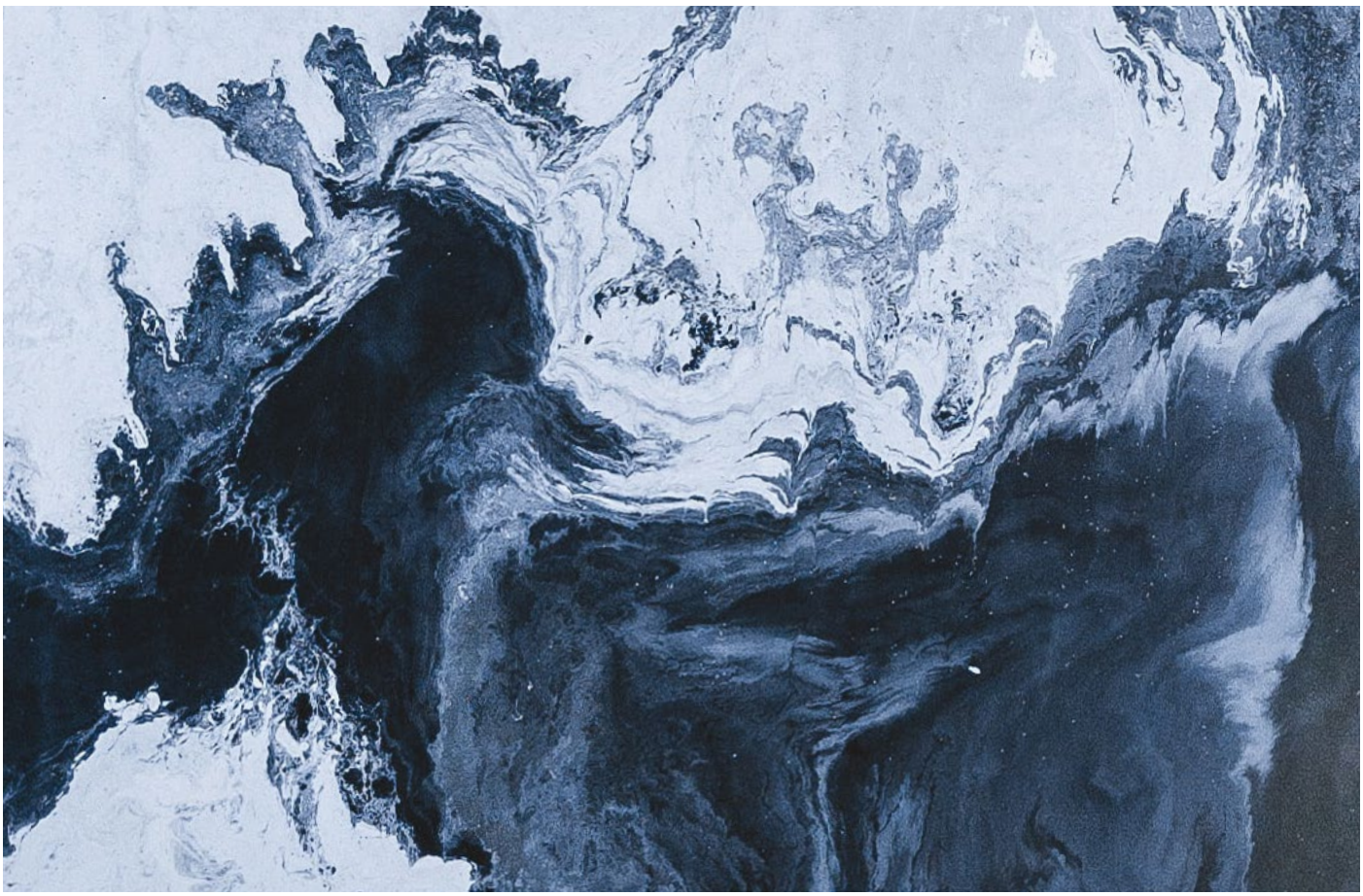
while these companies are profiting from, rather than paying for, their emissions. This is occurring with a range of products including cement, iron, steel, refined oil, chemicals and building materials.

Between 2008 and 2019, European energy-intensive industries gained between €26 and €46 billion of additional profits from passing through the opportunity cost of freely obtained emission allowances. Additional profits from cost pass-through were the most substantial in the iron and steel sector (€12-16 billion) followed by refineries (€7-12 billion) and cement (€3-7 billion).

Table 3: Industry windfall profits by sector in million EUR 2008-2019

Sector	Windfall profits from surplus	Windfall profits from international offsets	Windfall profits from average cost pass-through	Total windfall profits
Refineries	-1800	630	12,460	11,300
Petrochemicals	600	320	4010	5000
Cement	3000	310	6630	10,300
Iron and steel	-710	850	16,000	16,100

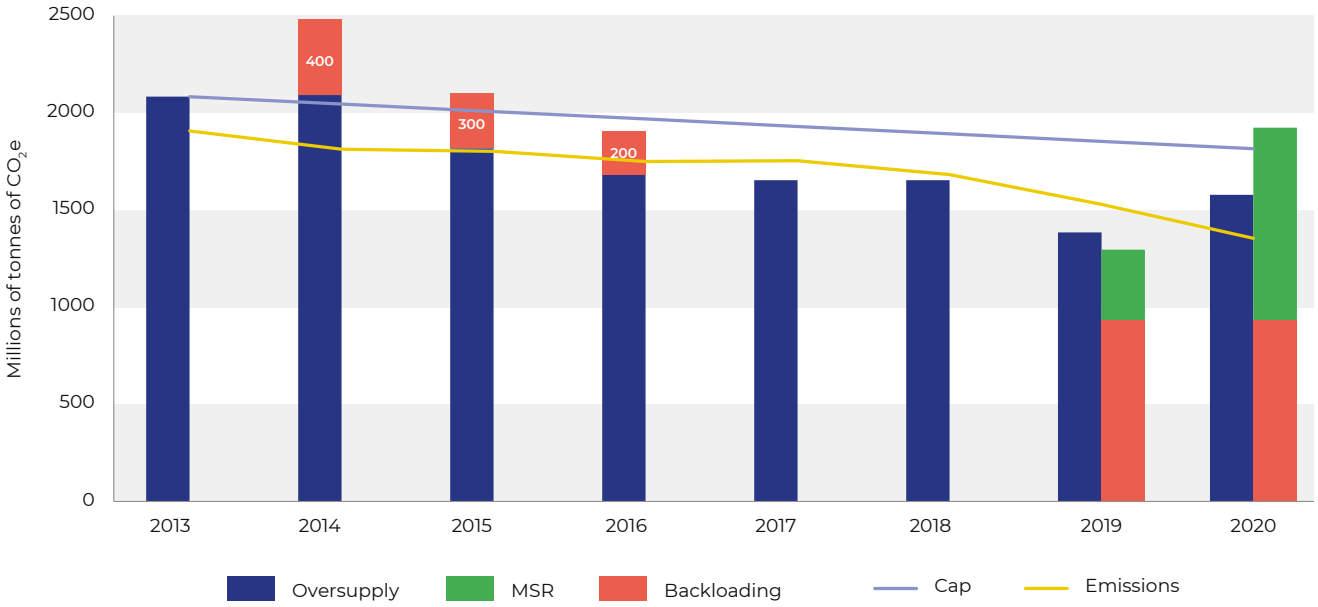
Source: Carbon Market Watch (2021), The Phantom Leakage - industry windfall profits from Europe's carbon market 2008-2019]



PERMISSION TO POLLUTE

During Phase 2 (2008-2012), a massive oversupply of allowances built up in the EU's Emissions Trading System. The oversupply was caused by an overgenerous setting of the cap, too many allowances handed out for free, international credits and an economic downturn due to the financial crisis which caused decreased production (and therefore pollution) across many EU ETS sectors. The supply of EUAs (auctioning and free allocation) outpaced the demand (emissions) for most of Phase 2 and Phase 3 - increasing the pile of oversupplied EUAs year by year. Total emissions decreased on average by 75 million tonnes of CO_2e per year during Phase 3, while the cap only decreased at half the speed (36 million tonnes per year). In addition, about 1.5 billion international credits entered the EU ETS. Note that the oversupply was already being slightly reduced in Phase 3 by the 'backloading' of allowances on the auctioning calendar: 900 million EUAs were taken from the auctioning calendar across 2014-2016 to be auctioned later. In the end these allowances ended up in the Market Stability Reserve.

Figure 9: Oversupply in the EU ETS during Phase 3



Sources: European Commission (2021), 'Report on the Functioning of the European Carbon Market in 2020'
Vivid Economics (2021), 'Review of the EU ETS market stability reserve'
European Commission (2021), 'Publication of the total number of allowances in circulation in 2020 for the purposes of the Market Stability Reserve under the EU Emissions Trading System established by Directive 2003/87/EC'

The oversupply of EUAs exceeded 2 billion units by the start of Phase 3 in 2013. Due to this saturation, the EU carbon price imploded to between €5 and 10 a tonne of carbon. Such a low carbon price undermined confidence in the EU ETS as an effective scheme to reduce emissions. While demand for EUAs was flexible, and driven by economic developments and other factors, supply was rigid, with the cap set years in advance. In 2012, the European Commission looked into structural solutions to the oversupply, including raising the emission reduction target or the LRF, cancelling some allowances, extending the EU ETS to other sectors, limiting international credits and price-setting mechanisms, such as a floor price or price management reserve.

In the end, a volume-based mechanism, known as the Market Stability Reserve (MSR), was chosen that would function according to predictable and objective parameters. When it came into operation in 2018, the period of low confidence and low carbon prices ended.

The MSR is a supply control mechanism that can limit the number of EUAs in circulation. It works on an annual cycle. Each year, the European Commission calculates the 'total number of allowances in circulation' (TNAC) - which in essence represents the oversupply under the EU ETS. The TNAC represents the number of allowances that left the market minus the number of allowances that have entered the market. If this quantity is greater than 833 million, a percentage of the oversupply is transferred to the MSR (the so-called intake rate of 24% until 2023, and 12% from 2024 onwards).[16] As Figure 6 shows, the oversupply is currently still far above that threshold of 833 million. The COVID-19 pandemic caused the oversupply to increase again in 2020, even with the MSR absorbing 397 million allowances between September 2019 and August 2020.

The surplus allowances in the market are not in the hands of the European Commission or member states - they are being held by the private entities that have acquired them through auctions, free allocation or on the secondary market. The Commission cannot just 'recall' these allowances to put them in the MSR. So when the MSR is used to limit the oversupply, the future supply itself is being limited: allowances are taken from auctions that member states would auction in the coming year and placed in the MSR (for example, in 2021 Germany will auction over 80 million EUAs less than foreseen and place them in the MSR). From 1 September 2020 to 31 August 2021 nearly 380 million allowances were subtracted from the planned auctions of all member states and transferred to the MSR.

The MSR does not merely soak up the oversupply, it will also start 'retiring' (i.e. deleting or cancelling) EUAs in 2023. This means that every allowance held above the volume auctioned the year before will be automatically cancelled. Once operational in 2023, this mechanism will play a major role in reining in oversupply, as the MSR currently already contains over 1.9 billion allowances and only around 780 million EUAs were auctioned in 2020. If implemented immediately, the MSR would cancel over a billion EUAs this year. That number will be significantly higher by 2023 as the MSR continues to suck surplus out of the EU ETS market over the coming two years and auctioning volumes decline in line with the decreasing cap.

Although we are currently still in a period of massive oversupply, the MSR is also designed to play a role in the so-far hypothetical case that the EUAs in circulation are considered too few for market functioning and liquidity. If the oversupply is lower than 400 million, the market is considered 'too tight' by policymakers. If this occurs, an additional 100 million EUAs will be withdrawn from the MSR the following year and auctioned.

The Market Stability Reserve has proven effective in supporting the carbon price since it started operating in 2018. Market participants seem to understand that the MSR is going to have its hands full bringing the years of oversupply to an end. However, the MSR was only designed to tackle the historic oversupply, which will take years to absorb. It is not fit to deal with current or future surpluses or shocks (such as the COVID-19 pandemic, economic downturns, planned coal plant closures).

Current national coal phase-out plans could add another 2 billion EUAs to the oversupply between 2021 and 2030.[17] The MSR needs to be bolstered if this and other additional oversupplies are to be kept from sinking the carbon price again.

The main tool for preventing another price crash is strengthening the MSR: increase its intake rate to 36% from 2024 onwards, reduce the thresholds over time and automatically cancel allowances held in the MSR for more than three years.

CARBON LEAKAGE PROTECTION

One of the main ghosts to haunt the EU ETS ever since its inception is carbon leakage. Carbon leakage is the hypothetical situation that European companies competing at international level would shift their production and/or investments (and pollution) to countries with less stringent or no climate policies. Thoeretically, this could even result in higher GHG emissions. The spectre of carbon leakage is the justification for the generous levels of free allowances offered to European heavy industries, in the hope of keeping them operating in the EU until they switch to clean production methods.

However, for industrial sectors like steel, cement and chemicals empirical evidence reveals that carbon leakage has not transitioned from the realm of theory to the real world.[18] This lack of historical evidence for carbon leakage could be either related to the EUA price being too low in the past and/or existing carbon leakage protection mechanisms, and research suggests that this risk has little chance of materialising in the future, even with rising carbon prices.

Despite the clear evidence that carbon is not leaking out of the system, carbon leakage receives enormous political attention (often spurred by vested interests of industry stakeholders) in the policy design of the EU ETS.

Carbon leakage protection mechanisms seek to protect high emitters by supposedly levelling the playing field - either by taking away, or compensating domestic producers for, carbon costs or by imposing a similar cost on foreign producers exporting to the EU. However, carbon leakage protection has been shown, in certain situations, to undermine the core polluter pays principle of the EU ETS, creates windfall profits for some industries and decreases the system's ability to positively influence the behaviour of companies. Shielding polluters from the cost of pollution undermines the incentive for industry to switch to cleaner production processes and contribute to meeting Europe's climate goals.

There is also an equity angle to this. Currently heavy industry does not really pay for its pollution, but in some countries ordinary people do. For example, in Sweden, there is a carbon tax on motor and heating fuels, while industrial concerns are exempt from national carbon taxes due to their inclusion in the EU ETS. In addition, the European Commission has proposed, under the Fit For 55 package, a separate ETS for transport and buildings where households will have to pay for their transport and heating emissions while industry would still not pay for their pollution. Free allocation also means that society loses the foregone revenues that could have been invested in greening our society and economy, while future generations are burdened with the costs of cleaning up this free pollution and dealing with the disastrous climate impacts it will cause.

Let's look deeper into the three key carbon leakage mechanisms: free allocation of emission permits, state aid to compensate for indirect costs and the proposed Carbon Border Adjustment Mechanism (CBAM).

FREE ALLOCATION OF EMISSION PERMITS

Under the Emissions Trading System, free emissions allowances are the key mechanism to protect industry and aviation from the presumed but unproven risk of carbon leakage. Over Phases 2 and 3, about €200 billion worth of EUAs were handed out at no cost to heavy industry.

Despite auctioning being the default rule in Phase 4 (2021-2030), for industry the sale of EUAs remains the exception: more than 95% of industrial emissions continue to be covered by free emission allowances. The Court of Auditors, the EU's external financial auditor, concluded that free allocation to the industrial

and aviation sectors was not based on their ability to pass through their direct ETS costs[19] (i.e. their cost of acquiring EUAs) and that there is a need for more targeted free allocation. In addition, it states that free allocation even tended to slow down decarbonisation efforts.

This trend is nowhere more apparent than in the diverging trajectories of heavy industry and aviation when compared with electricity and heating. Power generation has not received free allocations since 2013.[20] As noted earlier, industrial emissions have stagnated over the past decade and aviation emissions continue to grow, despite the generous subsidies they have received. In contrast, the power sector has implemented deep and sustained emissions cuts.

These free permits are a market failure since the external costs of carbon pollution (climate breakdown and the public health consequences of air pollution) are not borne by the producer, allowing companies to unfairly maximise their profits while leaving society to carry the tab for their pollution.

Additionally, by handing out free pollution permits EU member states forego auctioning revenues which could have been spent on further climate action, leaving the burden of this investment on other sectors of society. Between 2021 and 2030, another 6.5 billion emission allowances are planned to be handed out for free. This would represent another free pollution subsidy of over €325 billion (at an EUA price of €50).

For industry, the method for deciding who gets how many free allowances is complex[21] and consists of two parts:

- Determining which industrial sectors are considered at risk of carbon leakage
- Calculating how many allowances an individual installation in those sectors should receive

The list of sectors at risk (the so-called carbon leakage list) is supposed to be a tool to focus free allocations on those sectors that are truly in danger of being undermined by highly polluting foreign competition or of relocating rather than eliminating their polluting operations. The sectors on the list get 100% free allocation at benchmark level (which is explained in detail below). However, even sectors not on the list still receive 30% free allocations (which should decrease to zero starting in 2026).

While this 'carbon leakage list' is supposed to help focus on those sectors really at risk, in practice practically all industrial sectors are included. Sectors representing 94% of EU industrial emissions appear on it for Phase 4, a measly drop from the 98% during Phase 3.

Once a sector is on the list, individual installations receive 100% free allocations based on the emissions intensity of their production compared to other installations in their sector. This is operationalised using so-called product benchmarks[22] set as the average emissions of the 10% least emission intensive producers of a given product across the EU ETS (independent of technology, fuel or production process used).

Every installation in the sector receives free allocation at the benchmark level.[23] Those who are less emissions intensive than the benchmark actually receive more allowances than they need, while those emitting more have to acquire additional EUAs. The logic behind this is to reward the most efficient installations, while encouraging those running behind to catch up to (and hopefully) overtake the benchmark. Starting in Phase 4, the benchmarks will be improved annually, but at such a snail's pace (between 0.2 and 1.6%) that it is likely to provide little incentive for industrial sectors to reduce their emissions.

Heavy industry is so awash with free permits that almost no extra allowances need to be bought. In 2017, 2018 and 2019, free allocation covered 98.8%, 96.8% and 97.5% of industrial emissions respectively. Before that all industrial sectors together received more than they needed till 2016, and between 2006 and 2020 they accumulated 966 million more free allowances than they needed to surrender.

However, there are limits on the amount of allowances that can be allocated for free to industry. Throughout Phase 3 the amount determined using the carbon leakage list and the benchmarks always exceeded that limit. This meant that free allocation needed a 'haircut': all industrial installations annually had a percentage subtracted from their free allocation. This so-called Cross Sectoral Correction Factor (CSCF) reached 78% by 2020 (meaning 22% of free allocations were withheld).

Things have changed for Phase 4 because 57% of all allowances have to be auctioned , though 3% of all allowances can be made available for free to industrial sectors in case the limit on free allocations is reached. Therefore, the CSCF is unlikely to play a role until late in Phase 4 because the sum of free allocations till then is unlikely to exceed that limit.

The aviation sector also receives copious amounts of free allowances, only having to buy 15% of the allowances they need compared to baseline emissions at auction. The remaining 85% is received for free.

INDIRECT COST COMPENSATION

In addition to the free ETS allowances, a number of heavy industry sectors are entitled to state aid subsidies. These sectors include large electricity consuming sectors like aluminium, chemicals, paper and pulp, steel and iron, oil refineries, non-ferrous metals and some plastics. This state aid takes the form of cash payments from the member states the installations are located in to protect them from the carbon leakage risks caused by utilities passing on their own direct EU ETS costs via electricity bills.

These state aid schemes are regulated by a set of EU guidelines to limit competitive distortions between countries. However, as member states can choose whether or not to subsidise industry using these guidelines there is a race to the bottom: countries who don't give their industries these subsidies place them at a competitive disadvantage compared with those in countries that do hand out the subsidies.

Sums paid out by these state aid schemes have skyrocketed recently, not only due to rising EUA prices, but also because more countries, encouraged by industry lobbies, are implementing their own state aid schemes. In 2018, just over €460 million were paid out in 10 member states (+UK). By 2020, that had tripled to nearly €1.4 billion euros in 13 member states (+UK).[24] These member states paid out the equivalent of 8% of all their auction revenues in 2019 to prop up polluting industries, which increased to a whopping 13.7% in 2020.

In 2021, two more member states started handing out taxpayers' money using this scheme (Italy and the Czech Republic), bringing the total to 15 out of 27 member states, including the 10 largest.

These expensive state aid schemes are overly generous and wholly unnecessary. A study conducted for the European Commission found no proof of carbon leakage due to indirect EU ETS costs from the utilities sector being passed through to industry. Some of the industries eligible for this state aid are very unsustainable and polluting, such as oil refineries and plastic producers. The list was also expanded with a blackbox qualitative assessment - adding some sectors that were deemed undeserving by the Commission's own consultants .

The formula to calculate the amounts that can be paid out to individual industrial plants is also overly generous. It assumes that every factory only buys the dirtiest electricity in its region, and ignores energy efficiency and renewable energy developments.

The money is also handed out without any real strings attached. Conditions could have ensured the state aid brought about some climate benefit. For example, sectors who receive these public funds could have been mandated to use the subsidies to reduce their emissions or energy use.

TAXING QUESTIONS ABOUT THE CARBON BORDER ADJUSTMENT MECHANISM

At the time of writing, the Carbon Border Adjustment Mechanism (CBAM) is not yet up and running. It was proposed in July 2021 by the European Commission, and is being considered by the European Parliament and the Council under the ordinary legislative procedure.

Described as a carbon border tax, CBAM would require importers of goods produced outside the European Union to buy carbon certificates to cover the emissions embedded in their products. The price of the certificates would be calculated depending on the weekly average auction price of EU ETS allowances. Importers of the goods would have to, either individually or through a representative, register with national authorities to buy CBAM certificates. EU exporters would not be covered. Revenues would go to the EU budget to repay COVID-19 related debt.

The CBAM certificates mirror ETS prices and correspond to the carbon price that would have been paid had the goods been produced under the EU ETS. This system puts a price on carbon emissions but does not apply any decreasing cap on these emissions. Moreover, as CBAM is not a market, carbon certificates are neither tradeable nor bankable and they are cancelled as soon as they are surrendered for compliance.

According to the European Commission's proposal, the Carbon Border Adjustment Mechanism will be phased in gradually and will initially apply only to a limited set of sectors deemed at high risk of carbon leakage: iron and steel, cement, fertiliser, aluminium and electricity generation. For the first three years, importers will only need to report their embedded emissions to the CBAM but they will only start paying for certificates in 2026.

While there are no specific exemptions under the CBAM, the instrument does allow for fully deducting carbon prices already paid in by the producer outside the EU.

VIRTUOUS CYCLE

The European Commission conceived the CBAM as an instrument to support the reduction of emissions in the EU, while also providing an incentive to trading partners to raise their game. If properly implemented, the CBAM could effectively contribute to the decarbonisation of industry within and outside the EU. The Commission also identified it as an alternative to EU ETS carbon leakage protection measures such as free allowances and indirect cost compensation. By ensuring importers pay the same carbon price as domestic producers under the EU ETS, CBAM is meant to ensure equal treatment for products made in the EU and imports from elsewhere.

Since the current carbon leakage protection measures represent a market and regulatory failure and have provided virtually zero incentives to European industry to move to cleaner production processes, the introduction of a CBAM as an alternative to these measures could be beneficial to trigger emission reductions in Europe. Only if the CBAM is implemented in combination with the full elimination of free allocations under the EU ETS and other state subsidies will it help ensure that all industries with access to the EU's Single Market are finally paying for their pollution.

Furthermore, replacing free allocation with the CBAM would generate more auctioning revenues through the EU ETS. The Commission estimates that on average €14 billion of additional revenues would be raised every year. Instead of being used to serve part of the debt of the Next Generation EU programme, as the European Commission is proposing, the revenues generated through the sale of CBAM certificates should be channeled towards climate action outside the EU. Particularly in the form of international climate finance to support vulnerable countries in their efforts to decarbonise their economies. This would further demonstrate the CBAM's climate objectives and send a strong diplomatic message to trading partners.

HOW ARE ETS REVENUES USED?

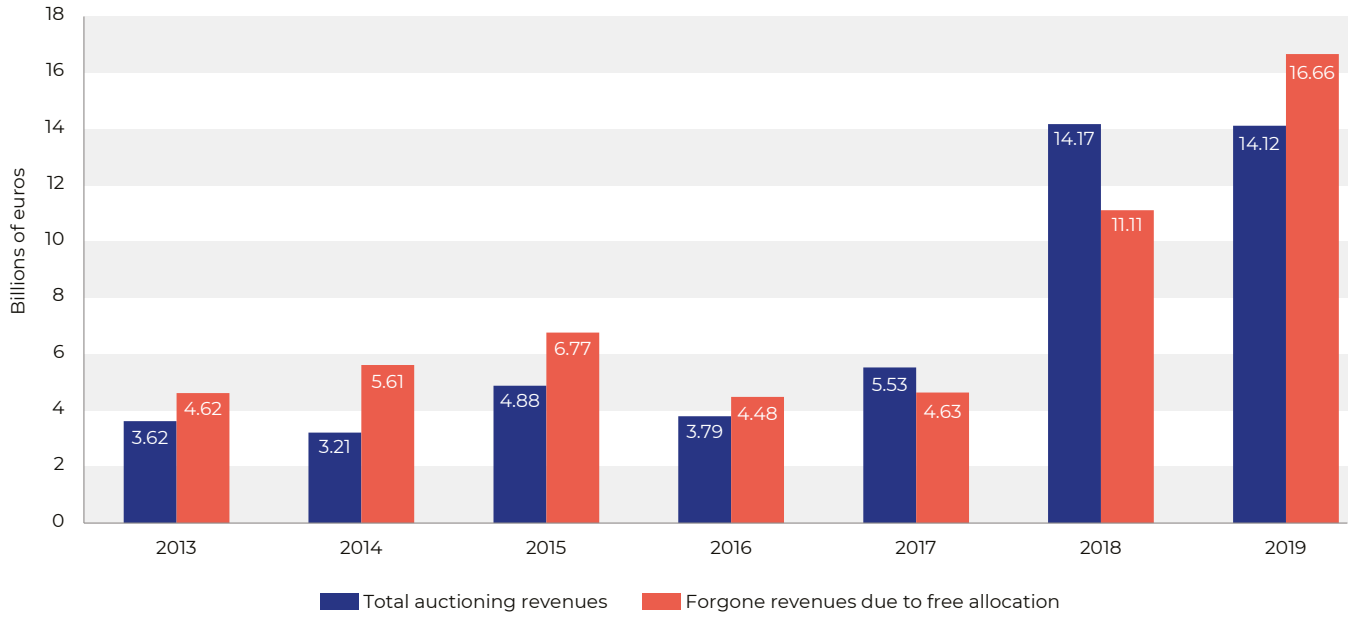
USE OF REVENUES BY MEMBER STATES

While the EU ETS's central goal is to reduce emissions, it has a co-benefit of generating significant revenues through the auctioning of EUAs, despite the fact that most allowances to industry are handed out for free. These revenues are a huge opportunity to finance climate action and support people through the climate transition.

Between 2013 and 2020, the EU ETS raised €68 billion in revenues for the member states, and this amount is increasing rapidly due to rising carbon prices, even as the cap decreases. In 2020, revenues amounted to €19 billion, and in the first half of 2021 alone they reached nearly €14 billion.

However, ETS revenues could have been much higher if it were not for free allocations to industry and airlines. It is estimated that between 2013 and 2019, €54 billion in revenues were foregone in this manner.

Figure 10: foregone revenues due to free allocation, compared with auctioning revenues (2013-2019)



Source: WWF (2021), 'Fit for 2030: optimising EU ETS revenues for people and climate'

Currently the member states decide on how to use most of the revenues from the EU ETS as long as these uses are consistent with the loose guidelines contained in the EU ETS Directive.

Specifically, 50% of the revenues 'should' be used for so-called climate and energy-related purposes. This 'should' is a non-binding recommendation, and member states are free to ignore it, though they do have to report on their revenue use. By their own reckoning, national governments exceeded these requirements. The European Commission reports that member states spent approximately 75% of all EU ETS revenues on 'climate action' throughout Phase 3 (2013-2020). Only a small proportion of all revenues were spent on international action (3%).

However, WWF reports that seven member states did not, in reality, comply with this recommendation over the 2013-2019 period. Croatia, Italy, Slovakia, and Romania only spent under 20% of their auctioning revenues on climate action.

Although the ETS Directive lists spending areas which can be considered 'climate and energy-related purposes', this list is vague and rife with loopholes. Spending on these areas does not necessarily reduce emissions, strengthen resilience to the impact of climate change, or promote the transition to a climate-neutral EU.

Member state reports to the Commission show that the majority of revenues labelled as climate spending supposedly go to promoting renewables and energy efficiency. However, this is questionable because the reporting is vague and of very low quality, with some countries leaving most or everything of the reporting template empty. This does not allow for independent review of whether or not each euro reported as climate spending actually was spent on climate action. For example, some spending clearly goes against the ethos of climate action (and may even hamper the accomplishment of climate goals). WWF highlights how Germany and Belgium spent 7% and 9% of their revenues on subsidy schemes compensating industry for indirect costs, while Poland and Hungary spent €11.6 and €25.2 million of their respective ETS revenues to fund fossil fuel heating systems.

In addition, it is impossible to ascertain whether the spending earmarked for climate purposes was additional spending or whether member states labelled already committed funds as using ETS revenues to fulfill the 'should use 50%' recommendation. Ideally, all ETS revenues should be spent on additional climate action, and when revenues increase so should that spending. But in the absence of transparent earmarking of EU ETS revenues, this question is challenging to answer. Moreover, in a number of cases member states select climate parts of their national budget and label them as using ETS revenues even though there is no direct link. Three member states, for example, reported more spending as 'use of ETS revenues' than they actually had revenues in the first place: Slovenia reported climate spending representing 227% of its ETS revenues, Cyprus 220% and Lithuania 161%.

Revenues would be better spent if they were transparently earmarked towards specific climate projects, and could be significantly raised by abolishing free allocation of EUAs.

INNOVATION FUND

Established in 2017, the EU ETS Innovation Fund is an EU level fund dedicated to supporting the demonstration of innovative low-carbon technologies. The projects financed by the Innovation Fund are required to be innovative and at advanced technology readiness levels so that the fund can help them reach the market. These projects are meant for energy-intensive industries (including ones substituting carbon-intensive products), carbon capture and utilisation (CCU) and carbon capture and storage (CCS), innovative renewable energy and energy storage technologies.

The Innovation Fund has two pillars: large-scale and small-scale projects. Small-scale projects are defined as those with eligible costs under €7.5 million which can benefit from simplified arrangements for application, selection and definition of relevant costs. Large-scale projects are selected based on a two-stage application procedure. The ultimate responsibility for the selection of the projects that are awarded the grants lies with the European Commission. The Commission consults member states on the list of pre-selected projects before grants are awarded.

Projects are selected based on a set of criteria, the main one being effectiveness in avoiding greenhouse gas emissions compared to an already existing technology. The other criteria in order of priority are: degree of innovation, project maturity, scalability and cost efficiency.

The Innovation Fund supports up to 60% of the additional capital and operational costs of large-scale projects and up to 60% of only the capital costs of small-scale projects. The funding for each project is disbursed in the form of grants and up to 40% of the grants can be

given based on predefined milestones before the whole project is fully up and running.

The first call for large-scale projects was launched in July 2020, with a budget of €1 billion, for breakthrough technologies for renewable energy, energy-intensive industries, energy storage, and carbon capture, use and storage. It received 311 applications for innovative clean tech projects. The results of this first call were published in November 2021. Seven projects were selected to receive funding. The successful projects cover different technologies, spanning from hydrogen production to its application in steelmaking and chemical production processes, renewable energy production and carbon capture and storage in the cement sector. The projects are located in Sweden, Finland, Belgium, Italy, Spain and France.

The revenues for the Innovation Fund come from the auctioning of 450 million EUAs between 2020 and 2030, as well as any unspent funds coming from the New Entrants Reserve (NER300), a programme with 300 million allowances allocated to it for the deployment of innovative, renewable energy technologies and carbon capture and storage. The total budget of the Innovation Fund, therefore, depends on the carbon price at which ETS allowances allocated to the fund are auctioned. At an EUA price of €50, it is worth approximately €22.5 billion. The draft European Commission Fit for 55 revision proposes to add an additional 50 million allowances on top of what is listed above.

MODERNISATION FUND

The Modernisation Fund assists 10 lower-income member states which would grow to 12 under the draft Fit for 55 package,[25] in modernising their energy sectors and improving energy efficiency. In that sense, it is a solidarity mechanism under the EU ETS. It is split up among these member states, with each member state having an allotted share that can be spent in that country. It will be operational for the entire Phase 4 (2021-2030).

Member states select projects that they would like to fund and send this list to the European Investment Bank (EIB), European Commission and a committee comprising the EIB, Commission and member states (the Investment Committee). Projects are either 'priority investments' or 'non-priority investments' - this status is decided upon by the EIB. Priority investments are in areas including, renewable energy, energy efficiency (if not related to energy generation using solid fossil fuels), energy storage, energy networks (grids, pipelines and district heating) and a just transition in regions which are economically dependent on fossil fuels.

Priority investments can go ahead immediately, with the funds being subtracted from what was allocated to the member state the investment will take place in. The EIB assesses non-priority investments to determine whether they are in line with the EU and the Paris Agreement's climate targets, and, if they pass that test, are voted upon by the Investment Committee. Only 70% of the cost of non-priority projects can be covered by the Modernisation Fund.

At least 70% of all funds for each member state have to go to priority investments, which can be fully financed by the Modernisation Fund.

The Modernisation Fund is funded from two distinct sources. First, revenues from 2% of the total allowances for Phase 4, about 275 million EUAs, are earmarked for the Modernisation Fund.[26] Second, the beneficiary member states can allocate additional allowances to the Modernisation Fund from two other EU ETS sources which together amount to some 365 million allowances. These do not go to the general pot but are added to what that specific beneficiary has a right to. In total,

the revenues from auctioning more than 640 million allowances will end up in the Modernisation Fund (representing €32 billion at an EUA price of €50). The shares allocated to the different beneficiaries vary substantially, with the Czech Republic and Romania each accounting for nearly a third of the total fund (mainly due to them adding more than 150 million allowances from other sources to their shares), while Latvia can only draw on 0.6% of the Modernisation Fund.

CONCLUSION

The EU ETS is a complex instrument. It seeks to put a price on carbon pollution from the power, manufacturing, and aviation sectors (with shipping likely to be added soon) to reduce emissions in a cost-effective manner. The European Commission proposed in 2021 to establish a separate ETS system for buildings and transport. While these might be linked or merged with the EU ETS this is not on the books yet, as it is not even a given that this separate ETS for transport and buildings will actually come into being.

The EU ETS has had its fair share of failures and problems, but also its successes.

Its key failures have been mainly due to lack of foresight or overly generous exemptions based on the perceived need to shield sectors from the actual impacts of the EU ETS.

The EU ETS has accumulated a large and unsustainable oversupply since 2008, and it took a decade before a meaningful mechanism to solve it became operational, the Market Stability Reserve (MSR). Over that period, the EU carbon price dropped to levels that derailed climate action and ushered in a lost decade of low confidence in the market. There are more sources of oversupply impacting the EU ETS or looming on the horizon. The MSR must be strengthened to address these emerging oversupply issues to ensure we do not re-enter a period of damagingly low prices.

Carbon leakage protection mechanisms are overly generous, undermine the polluter pays principle and seriously hamper the functioning of the EU ETS. The ghost of carbon leakage risk has haunted the EU ETS, without any actual carbon leakage taking place. Therefore, energy-intensive industries have not paid for their pollution till now. Instead, they made windfall profits of some €50 billion. This is as preposterous as taxing tobacco but giving smokers free cigarettes and a generous public stipend to smoke - but with consequences for the health of the planet.

The effect on the climate transition has been disastrous: industrial emissions decreased by a paltry 1.3% between 2013 and 2019. This seriously undermines the decarbonisation of those sectors. Moreover, it leaves them wholly unprepared to become innovation leaders in a climate-neutral world. Continuing the practice of handing out free pollution permits in the midst of a climate crisis is untenable and unethical.

But there have also been substantial successes. The EU ETS has evolved over time, becoming a more effective climate breakdown mitigation tool each time it is revised. The Market Stability Reserve is actively tackling historic oversupply, with emissions by covered entities having dropped by 43% compared to 2005. This is largely thanks to the power sector, which is decarbonizing steadily, but is not there just yet. Emissions from electricity and heat production have decreased sharply the past 10 years, by nearly 45% since 2011.

In addition, the EU ETS is providing an example and lessons learned for neighbouring and other countries seeking to implement a cap-and-trade mechanism. The Korean ETS and the Chinese ETS, for example, have taken some of these lessons on board, but they are also repeating some of the mistakes.

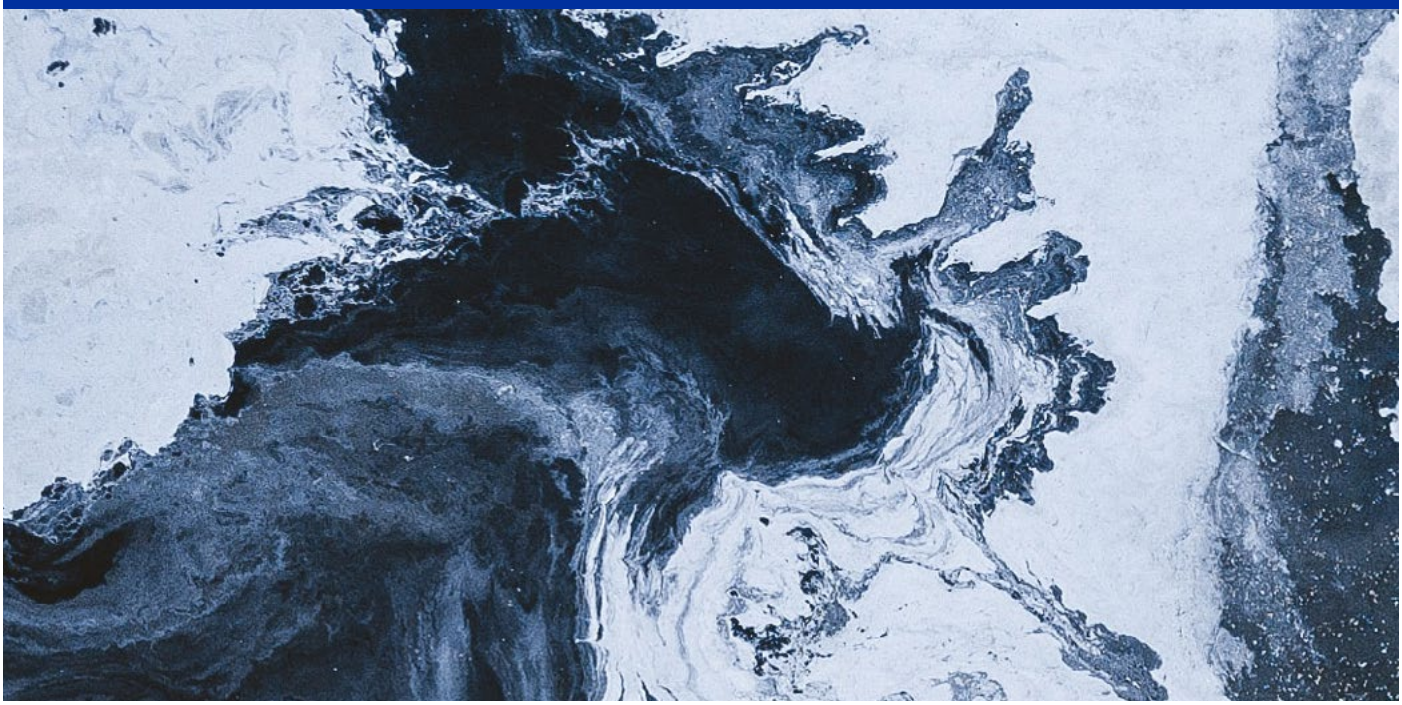
Key improvements that remain necessary at the time of writing are:

Reduce the emissions cap to bring the EU ETS in line with the Paris Agreement 1.5°C target and what the EU's fair share of climate action is (-65% overall greenhouse gas emission by 2030 and climate neutrality by 2040). This can be achieved by a one-off reduction of the cap by 450 million EUAs to align it with real emission levels, and by permanently retiring unnecessary surplus emission allowances from the market.

Strengthen the Market Stability Reserve so it can also deal with future sources of oversupply, instead of already having its hands full just tackling historic oversupply.

Abolish free allocation of pollution permits and use the CBAM as an alternative to carbon leakage measures under the EU ETS. The two protection mechanisms must not overlap, as they would amount to double protection, double subsidies and would be incompatible with WTO rules.

Invest all revenues generated through the EU ETS into funding climate action and the transition to a climate-neutral Europe. Revenues from the Carbon Border Adjustment Mechanism should be directed to finance climate action in least developed countries that are affected by the CBAM.



NOTES

1 Note, numbers in this briefing mainly refer to the end of 2020 - until which the UK was still a member of the European Union and the EU ETS including UK installations.

2 The full list of industrial sectors and gases covered in each sector is listed in Annex I of the EU ETS Directive.

3 Carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and Sulphur Hexafluoride (SF6) - Annex II of the ETS Directive

4 Carbon leakage is the hypothetical situation that European companies competing at international level would shift their production and/or investments (and pollution) to countries with less stringent or no climate policies. Thoeretically, this could even result in higher GHG emissions.

5 Not taking the aviation sector into account

6 One of the key reasons that so few member states use the Article 10c Derogation is that it cannot be used to support coal fired power plants.

7 The NER300 programme was the predecessor of the Innovation Fund, and started operating in 2012.

8 Exceptions are discussed above in the box on the Article 10c derogation

9 Under the Energy Community Treaty they should be compliant with the Large Combustion Plants Directive but all Western Balkan countries with coal are currently in breach. See Centre for Research on Energy and Clean Air and CEE Bankwatch Network, Comply or Close, September 2021. complyorclose.org

10 Montenegro introduced a carbon pricing scheme but it is currently being revised as of December 2021.

11 Note that we will use conservative price estimates of 50 EUR per EUA for the 2021-2030 period, in line with those used by the European Commission in the Impact Assessment accompanying their July 2021 proposal for revising the EU ETS as part of the Fit for 55 package (see page 35 of the Staff Working Document in annex to the proposal here: https://ec.europa.eu/info/sites/default/files/revision-eu-ets_with-annex_en_0.pdf)

12 In economic theory, a windfall profit is the unexpected or abnormal gain which companies make based on unforeseen scenarios.

13 Generated under the Clean Development Mechanism (CDM) and Joint Implementation (JI).

14 See Annex A of https://carbonmarketwatch.org/publications/additional-profits-of-sectors-and-firms-from-the-eu-ets-2008-2019/ for more information on this

15 Note that even in Phase 4 over 95% of their actual emissions will be covered with free allocation

16 The European Commission Fit for 55 proposal would set the intake rate to 24% till 2030.

17 Note that member states can choose to voluntarily cancel EUAs from their auctions in response to shutting down electricity generating capacity. However, as this involves foregoing auction revenues, member states have a strong incentive not to use this provision. A limited number of member states has indicated that they will use this provision, including Germany and Sweden.

18 Bruegel (2020), 'A European carbon border tax: much pain, little gain (https://www.bruegel.org/2020/03/a-european-carbon-border-tax-much-pain-little-gain/); Dechezleprêtre A, Gennaioli C, Martin R, Muûls M and Stoerk T (2021) Searching for carbon leaks in multinational companies. Centre for Climate Change Economics and Policy Working Paper No. 187 and Eugénie Joltreau & Katrin Sommerfeld (2019) Why does emissions trading under the EU Emissions Trading System (ETS) not affect firms' competitiveness? Empirical findings from the literature, Climate Policy, 19:4, 453-471, DOI: 10.1080/14693062.2018.1502145

19 Companies under the EU ETS increase the prices of their products to cover their own costs of purchasing allowances - this is called 'passing through direct ETS costs'

20 except for the Article 10c derogation discussed earlier

21 The rules determining how to operationalise free allocation are listed under the heading 'Transitional measures to support certain energy intensive industries in the event of carbon leakage' - these rules have been in place in various forms for over 15 years and will remain so for close to another 10 years, so they can't really be called transitional. And no 'event of carbon leakage' has ever been detected.

22 For some sectors it was deemed too challenging to implement a product benchmark, and therefore benchmarks based on fuel or heat consumption were implemented

23 In Phase 3 this was multiplied for their 'historic activity level' which is their historical production. If you decreased production your free allocation didn't go down leading to some perverse incentives to reduce production. In Phase 4 this will be partially corrected by bringing free allocation closer in line to real production levels.

24 Which, while a significant number, pales in comparison to the free pollution subsidy of over 360 billion euros (at a EUA price of 55 euros) represented by free allocation between 2021 and 2030.

25 Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia; with Greece and Poland added under the European Commission proposal.

26 The European Commission proposed in its Fit For 55 review to add another 2.5% of all auctioning revenues to the Modernisation Fund - to be used by member states with GDP per capita of lower than 65% of the EU average. This way Greece and Portugal will be added as beneficiaries of the second tier of the Modernisation Fund (2,5% of auctioning revenues), but not the first tier (2% of auctioning revenues)

THANK YOU

For reading.

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