Mission *Fair* Transition

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How does the European emissions trading system (EU-ETS) work and is it a good instrument to tackle the climate crisis?

Introduction:

It is the central instrument of European climate policy: the **European Emissions Trading System (EU ETS)**. Conservative and liberal parties in particular, but also parties on the left, see it as the key to achieving European climate targets[1]. But how exactly does emissions trading actually work? Does it reliably lead to emission reductions, or does it only look good in theory but achieve little or nothing in practice? We want to explain this to you in this MFT Policy Brief.

How does EU-ETS work in general?

There are different types of emissions trading systems, which differ largely in terms of their environmental integrity. The EU ETS is a so-called "**cap and trade**" system. This means that the EU sets an **annual emissions budget (cap)** that the economic sectors covered by the EU ETS must not exceed. The cap shrinks each year by a fixed percentage, the so-called **Linear Reduction Factor (LRF)**. Anyone who wants to emit CO_2 must buy **emission allowances**. One emission allowance (EUA = EU Allowance) corresponds to one ton of CO_2. Every September, emitters must surrender the corresponding amount of allowances for their previous year's emissions. If they have not bought any, they have to pay penalties. In 2013, the penalties amounted to €100/tCO_2 and have since increased in line with the European Consumer Price Index (an indicator of inflation). In this way, the penalty amounted to €128.71/tCO_2 last year[2].

Most of the emission allowances are auctioned by the member states and are traded on markets. This results in a **fluctuating price**. In practice, this means that when the market price of certificates is high and the electricity price is low, for example, lignite-fired power plants are shut down because the achievable sales price for the electricity would be lower than the production costs together with the costs for emission certificates that would have to be paid for the emissions generated during electricity production. Through this **cost mechanism**, rising certificate prices gradually lead to a decline in fossil value creation. In the language of economists, one would say that CO_2 emissions are given "**opportunity costs**"

[1] See for example the German CDU and CSU election program for the 2024 European elections (p. 12), the FDP program for the 2024 European elections (p. 18) or the Bündnis 90/ Die Grünen program for the 2024 European elections (p. 14 and 75).
[2] Directive 2008/101/EC, 2009 OJ (L 8) 3 and Directive 2023/959, 2023 OJ (L 130) 150.

through emissions trading. This means that the cost of emitting a tonne of CO_2 corresponds to the price that could be achieved by selling a certificate on the certificate market. Even if companies are allocated certificates for free (which is currently still the practice, particularly for industry, despite a downward trend), they have an incentive to reduce their emissions and sell their certificates on the market for good money instead.

The **tradability of emission allowances** means that emissions are saved where it is most **cost-efficient**. A company for which saving emissions is very expensive prefers to buy certificates (which it considers to be cheaper) and continue to emit, while a company whose emission avoidance costs are lower than the price of the certificates saves emissions. From a climate protection perspective, the aim of this mechanism is to gradually reflect the so-called **external costs of greenhouse gas emissions**, i.e. the damage caused by climate change, in market prices and thus facilitate the transition to a sustainable economic system.

Who has to surrender certificates for their emissions?

If you are now wondering in a panic whether you should have bought emissions certificates for your last petrol purchase, don´t worry! As things stand today, only certain companies are subject to emissions trading. However, this will change in 2027. Let's take a closer look.

The emissions trading system (ETS 1), which has been in place since 2005, covers the following sectors: the **energy industry** (i.e. electricity generation), **energy-intensive industrial companies** (e.g. steelworks), **intra-European aviation** and, since 2024, **maritime transport**[3]. This covers around **37% of the EU's total GHG emissions** and 5% of global GHG emissions (Verde and Borghesi 2022; Agora Energiewende and Agora Verkehrswende 2023).

From 2027, however, a second emissions trading system (**ETS 2**) will be introduced that covers emissions from the **buildings and transport sectors**[4]. Refueling and heating will then actually become more expensive. Nevertheless, drivers, tenants and homeowners will not have to worry about buying certificates themselves. ETS 2 is (in contrast to ETS 1) a so-called "**upstream system**". This means that it is not the emitter himself, but the distributor of the fossil fuels (i.e. the fuel or heating oil supplier) who must purchase and redeem the certificates[5].

By the way, in Germany, the introduction of ETS 2 will not change much. This is because Germany already has a **national emissions trading system (nEHS)** for the transport and building sector based on the Fuel Emissions Trading Act (BEHG). Despite its name, the nEHS is currently a fixed-price system with politically determined CO_2 prices (2024: €45/t CO_2; 2025: €55/t CO_2)[6]. Nevertheless, it means that the emissions caused by driving and heating in Germany are already being priced today (Frenz 2023: 313 f.).

Together, **ETS 1 and ETS 2 will cover around 75% of the EU's total GHG emissions from 2027**. There are also ideas to include the waste management sector in ETS 2 (Agora Energiewende and Agora Verkehrswende 2023: 13 f.).

[3] Directive 2003/87/EC, 2003 OJ (L 275) 32.
[4] Directive 2023/959, 2023 OJ (L 130).
[5] Ibd.
[6] Art. 7 Haushaltsfinanzierungsgesetz 2024 from 12/22/2023.

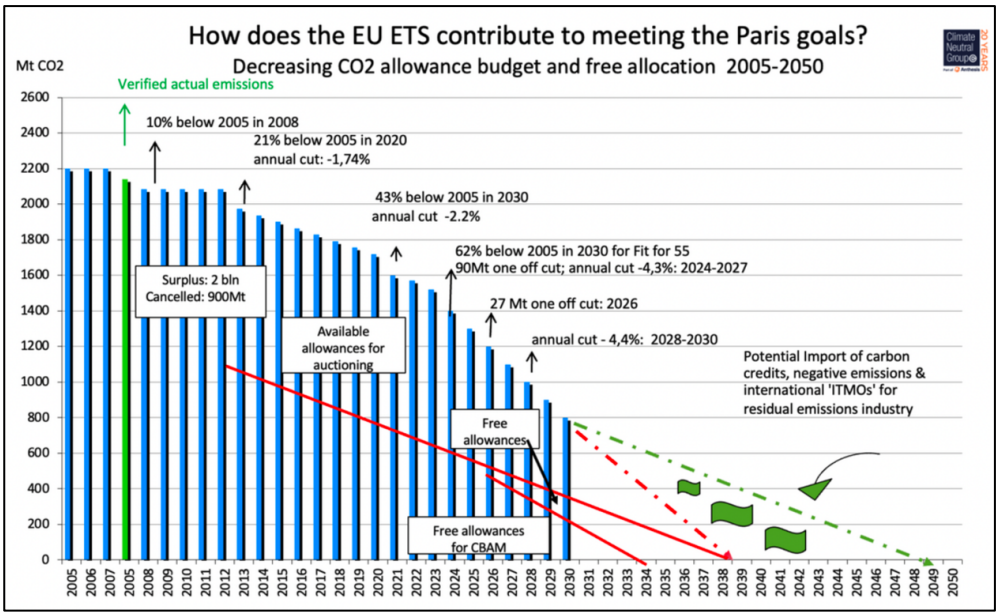
What happens to the revenue from emissions trading?

The majority of allowances are auctioned by the member states. Only 2% of the allowances are auctioned by the EU itself. This means that most of the **proceeds from the sale of allowances go directly to the Member States**. Since 2023, the member states must use the proceeds exclusively to **finance climate policy programs** - previously at least 50 percent[7]. In Germany, for example, the ETS revenues flow into the so-called Climate and Transformation Fund (KTF)[8], which in turn is used to finance things such as the development of a hydrogen industry and the promotion of electromobility. In Germany, record revenues of over 18 billion Euros from ETS 1 and the nEHS flowed into the KTF in 2023 (UBA 2024). In the EU as a whole, **European emissions trading generated revenue of 43.6 billion Euros in 2023** (ICAP 2024).

And does the whole thing really help the climate?

The short answer is: **Yes!** In the past, the European Emissions Trading System was often criticized for the fact that it basically did not lead to any significant reductions in emissions. The criticism was justified for a long time, as the European emissions trading system had some serious weaknesses in its first two trading periods (from 2005 to 2012) (Ellerman et al. 2010). However, this was not due to emissions trading as an instrument, but to the unwillingness of European climate policy to equip the ETS with ambitious reduction targets. As part of the "**Fit for 55 package**", however, the EU has tightened up the ETS considerably.

The **linear reduction factor in ETS 1** has been **4.3%** since this year (**4.4% from 2028**)[9]. In **ETS 2, the cap will shrink by 5.1% in the first year and then, from 2028, by 5.38% annually**[10].



Source: emissierechten.nl

[7] Directive 2023/959, 2023 OJ (L 130).
[8] §4 Abs. 1 Nr. 1 KTFG.
[9] Directive 2023/959, 2023 OJ (L 130).
[10] Directive 2023/959, 2023 OJ (L 130).

This means that the maximum amount of emissions that can be emitted in the European economy will decrease significantly every year. With the cap's currently defined shrinking path, **CO2 emissions from the ETS 1 sectors will have fallen to zero by 2039** (Cozijnsen 2023). In practical terms, this means that from 2039 there will only be climate-neutral electricity, steel, chemical products, etc. in the EU. The regulations for the further development of the ETS for the 2030s are already being discussed at European level - this also includes the question of the extent to which technically unavoidable emissions can be offset by the permanent storage of CO2 and negative emissions in other sectors in ETS 1. For the **ETS 2 sectors** (transport and buildings), the agreed reduction pathway means a **43% reduction in CO2 emissions by 2030 compared to 2005**[11].

In contrast to a CO2 tax or other forms of emissions trading, a cap-and-trade system such as the **ETS is very effective and reliably leads to emission reductions**. This is simply because a minimum reduction path is set by law due to the shrinking cap. In European emissions trading, a so-called **market stability reserve (MSR)** has also ensured since 2019 that surplus certificates from previous trading periods are gradually reduced and the system therefore provides clear incentives for more climate protection. In this respect, it is crucial for the effectiveness and ecological integrity of a cap-and-trade system that the cap shrinks quickly enough, that the penalties for not surrendering emission allowances are high enough and that no emission credits from ecologically questionable climate protection projects can be offset against the cap.

Empirical evidence has shown that CO2 emissions in the ETS sectors have decreased since the introduction of the ETS, although economic activity has increased (Meadows et al. 2019: 67). This is what economists call "**absolute decoupling**". It is difficult to say whether these reductions can be attributed to the ETS alone. However, the emission reductions in the ETS sectors were significantly greater in the past than in the sectors not covered by the ETS. This suggests a significant influence of the ETS on emission reductions.

What are the problems and where is there a need for action?

But has the current emissions trading system solved all the problems of European climate policy? No. Even if the ETS reliably leads to emission reductions, there are some things it cannot achieve. For example, emissions trading cannot guarantee that the **burden of rising CO2 prices** will be distributed in a regionally and socially equitable manner. However, there are convincing proposals as to how this can be ensured in the future - in particular via a climate dividend and support programs for vulnerable households (see: UBA 2023). Furthermore, emissions trading cannot prevent carbon-intensive industries and companies from moving to countries with no carbon pricing and producing their climate-damaging goods there, or consumers from switching to cheaper products from countries without a carbon price. This is known as "**carbon leakage**". In the past, the EU has tried to prevent carbon leakage by allocating allowances to emission-intensive companies free of charge. With the **Carbon Border Adjustment Mechanism (CBAM)**, the EU introduced a new instrument at the end of 2023 to prevent carbon leakage. We will explain this in a separate MFT Policy Brief.

A far more fundamental problem with the ETS is the question of **whether its reduction targets (i.e. the cap's shrinkage path) are ambitious enough**. However, this is not a functional problem of the ETS, but only a question of which linear reduction factors are politically agreed and which sectors and emissions are covered by the ETS. A problem

[11] Directive 2023/959, 2023 OJ (L 130).

directly related to the functioning of the ETS, on the other hand, is the question of whether so-called "**carbon credits**" from climate protection projects inside or outside the EU (e.g. rainforest protection projects in Latin America) may be used for compliance in the EU ETS instead of EUAs. This could undermine the environmental integrity of the ETS. Currently, such offsets are not permitted, but are regularly brought into the political debate.

Conclusion:

The European Emissions Trading System (EU ETS) is an **effective instrument of European climate policy** with which **CO2 emissions can be reduced reliably and predictably**. At the same time, it ensures that emissions are reduced where the costs of avoiding emissions are lowest. This makes the EU ETS a climate policy instrument with great **economic efficiency** and potentially high impact. Around 40% of European CO2 emissions are currently covered by the ETS, and this proportion will rise to around 75% by 2027 with the introduction of ETS 2. The current calibration of ETS 1 will lead to net zero emissions in the energy sector, energy-intensive industry, intra-European aviation and maritime transport by 2038. For other transport and the building sector, a 43% reduction in emissions compared to 2005 has been set for 2030. **Challenges of the ETS** are a socially equitable distribution of burdens and carbon leakage. However, some concepts for this have already been developed (climate dividend) or even adopted (CBAM). It is also questionable whether the current reduction targets of the ETS are compatible with the Paris Climate Agreement and the goal of global climate justice. It is up to politicians to set appropriate targets for the ETS.

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