



**METROPOLITAN RESEARCH
INSTITUTE** VÁROSKUTATÁS KFT.

Impacts of the introduction of the ETS2 on the Hungarian building sector

April 30, 2026

**Authors: Éva Gerőházi, Olga Müller,
Hanna Szemző, Bálint Szöllősi
(Metropolitan Research Institute)**



Table of Contents

Executive Summary	3
1 Introduction - Understanding ETS and ETS2	7
1.1 How the ETS system works.....	7
1.2 A step forward: introducing the ETS2 system	9
1.3 Solidarity Provision	11
1.4 Insecurities in the system.....	12
2 Impact of the ETS and ETS2 systems	15
2.1 Predicted impacts of ETS2	17
3 Mitigating the impacts - Funding mechanisms connected to the redistribution of ETS and ETS2 allowances	20
3.1 Funds supported by ETS revenues	20
3.2 Funds supported by ETS2 revenues	22
4 Hungary: The case of ETS and ETS2.....	24
4.1 Effects of the ETS.....	24
4.2 How ETS revenues have been generated and used so far?	24
4.3 Who will be affected by ETS2 the most?.....	26
5 Scenarios for the Hungarian adaptation	32
5.1 Price impact scenarios.....	32
5.2 Mitigation strategy	36
6 Annex.....	39
6.1 The establishment and main characteristics of the EU ETS	39
6.2 National adaptation strategies to combat the effects of ETS2 - the role of Social Climate Plans 48	
6.2.1 Defining the affected groups: the energy poor and vulnerable households	50
6.2.2 Structural interventions and direct income contributions.....	53
6.2.3 National examples for consumer compensation	56
6.3 Additional attributes of the Hungarian housing stock most likely to be impacted by ETS2 .	61
7 References.....	64

EXECUTIVE SUMMARY

Given the political sensitivity of the Emissions Trading System 2 (ETS2), the overarching aim of the contract between the Metropolitan Research Institute and the European Climate Foundation is to test and structure arguments directed at households that may increase public and political acceptance of ETS2, while also equipping decision-makers with evidence-based narratives addressing economic, social, and geopolitical concerns. The present study constitutes the first step in this direction by establishing a robust evidence base for the further development of effective discursive strategies surrounding the introduction of ETS2, specifically in the residential building sector.

ETS2 has emerged as a politically contentious issue among Member States, with several countries — including Hungary — expressing opposition due to concerns regarding social impacts and energy affordability. The geopolitical context, including the aftermath of the war in Ukraine, the ongoing conflict in Iran, and broader energy market disruptions, further complicates its introduction. In addition, the revision of the ETS legislation scheduled for July 2026 may introduce further adjustments to the system.

To situate ETS2 within its broader regulatory context, **the report begins by outlining the structure and functioning of the existing EU ETS and explaining how the planned ETS2 is connected to it.** The EU ETS is based on the obligation of energy-intensive industries (ETS1) and fuel suppliers (ETS2) to purchase allowances through European auctions or on the secondary market in proportion to the amount of greenhouse gases (primarily CO₂) they emit. If companies implement energy-efficiency measures, the number of allowances they are required to acquire decreases. In this way, the ETS creates incentives for efficiency investments, while the cost of allowances is partially passed on through the prices of the products and services provided.

The study then evaluates the impacts of ETS1 and the projected effects of ETS2. Empirical evidence demonstrates that ETS1, operational since 2005, has delivered significant emissions reductions, particularly in the power sector, while maintaining overall economic performance. At the same time, carbon pricing has contributed to inflationary pressures and broader macroeconomic effects, especially as the volume of free allowances has declined.

ETS2 extends carbon pricing to previously uncovered sectors — buildings, road transport, and small-scale industry — with the aim of covering up to 75% of EU greenhouse gas emissions. Existing projections estimate the possible price impact of ETS2 to range from approximately €45 to more than €200 per tCO₂. During the first three years of ETS2 implementation (from 2028 onward), the EU is required to apply protective mechanisms to keep allowance prices at €45 maximum. Nevertheless, these additional costs on fuels — including petrol, oil, kerosene, LPG, natural gas, heavy fuel oil, coal, and coke — are expected to increase energy prices associated with residential and public buildings, as well as transport systems.

To mitigate these effects, the report reviews redistribution and funding mechanisms linked to ETS and ETS2. Existing instruments — such as the Modernisation Fund, the Innovation Fund, and solidarity provisions — play a critical role in supporting lower-income Member States. The newly established Social Climate Fund (SCF) has been specifically designed to address the social consequences of ETS2 by financing energy-efficiency improvements, clean mobility, and temporary income support for vulnerable groups.

However, progress regarding the preparation of Social Climate Plans (SCPs) remains limited. At the time of writing, only a few Member States had submitted plans, and only Sweden's plan had been approved. The analysis of draft plans indicates that defining and targeting vulnerable groups remains a complex task, with significant variation across countries in terms of methodology and scope. Nevertheless, most approaches link vulnerability to income levels, energy expenditure, and housing conditions. Importantly, the projected increase in energy poverty resulting from ETS2 is generally moderate, although highly dependent on national policy responses.

The Hungarian case analysed in the study illustrates the challenges of implementing ETS2 in a politically sensitive environment. **Hungary has thus far experienced limited direct impacts from the EU ETS** due to its energy mix, regulated household energy prices, and the use of free allocation mechanisms. ETS revenues have primarily supported energy infrastructure and supply-side investments, with less emphasis on household-level interventions.

Regarding the direct impact of ETS2 on Hungary's residential building sector, models developed by the Regional Energy Research Centre (Bartek-Lesi et al.) indicate that, if the €45 per tCO₂ allowance price is fully transferred to consumers, **the currently capped price of natural gas would increase by approximately 50%** (firewood and 95% of district heating are not subject to ETS2). Although this increase may appear substantial, the protected tariff applies up to an annual consumption threshold of 1,729 m³ of gas (and approximately 80-90% of households remain below this threshold), meaning that **the average monthly increase would amount to roughly 7,800 HUF at most.**

At the same time, the impacts of ETS2 may be highly uneven. The greatest burden would fall on households living in the least energy-efficient buildings (roughly corresponding to H-I energy performance categories) and relying primarily on natural gas for heating. **According to the 2022 Census, 87% of these dwellings are detached family houses. This building stock represents nearly 50% of housing units in villages, while almost 20% of Budapest's housing stock is also affected.** Most of these units are located in eastern Hungary, particularly in smaller towns and villages. Many of these households already exceed the protected consumption threshold and therefore pay a gas price seven times higher for each additional cubic metre consumed. In the case of a typical "Kádár cube" house consuming approximately 3,500 m³ of gas annually, heating expenditures may rise to as much as 1.5 million HUF per year.

Overall, the price impact of ETS2 on the Hungarian residential building stock is expected to be substantial, though not universal — at least during the first three years of implementation,

when EU-level protective mechanisms remain in place. Beyond this initial phase, future developments are considerably more difficult to model.

At the same time, the potential phasing-out of the current utility price cap system may have a far more significant impact. Different models estimate varying future market price levels for household gas consumption, and these projections remain highly uncertain due to the short- and medium-term consequences of the conflict in Iran. Nevertheless, one plausible scenario suggests that market gas prices could become four times higher than the current protected prices. Under such circumstances, the **politically sensitive issue would be less the introduction of ETS2 itself and more the possible reconsideration of the utility price cap system**, particularly given the strong political commitments associated with it.

If sufficient political will to restructure the utility price cap system is lacking — for example, by gradually lowering the volume of gas eligible for protected pricing and introducing multiple pricing tiers instead of the current system, in which prices above the threshold are seven times higher — **then the introduction of ETS2 in Hungary alone may represent a positive step toward a fairer pricing system** that provides stronger incentives for energy efficiency improvements. The direct price impacts would likely remain manageable, while ETS2 and the Social Climate Fund could generate substantial revenues that may be used both to mitigate adverse impacts and to finance energy-efficiency interventions in the housing stock.

These revenues, combined with funding from other European instruments such as the Recovery and Resilience Facility, could provide a solid foundation for launching a large-scale renovation process in the housing sector. Depending on political priorities — for example, the share of ETS and SCF resources allocated to buildings as opposed to transport — **it may be possible to mobilise approximately HUF 400–500 billion (€1.1–1.3 billion) annually for renovation purposes**. While this amount alone would still be insufficient to achieve the targeted annual deep renovation rate of 3%, it could significantly leverage additional private investment.

Based on data from the 2022 Census, which included modelled energy consumption estimates for the residential housing stock, it can be observed that prioritising the worst-performing buildings (H–I energy categories, accounting for approximately 47% of the housing stock) still leaves policymakers with considerable flexibility regarding intervention design. **In villages and small towns, the least energy-efficient buildings are predominantly inhabited by the most socially vulnerable populations. In contrast, in larger cities and Budapest, the social composition of residents living in such buildings is considerably more diverse.** This suggests that, in smaller settlements, the renovation of the worst-performing buildings should be supported through high subsidy rates combined with intensive social assistance, whereas in larger urban areas and Budapest, more mainstream programmes with lower subsidy rates may also prove effective. **The first target group could be prioritised within the framework of the Social Climate Fund, while the latter could be supported through general ETS revenues.**

An additional consideration concerns not only the amount of subsidies available, but also their timing. The implementation of structural measures — including the establishment of support

schemes, beneficiary selection, and the execution of renovations — is a time-consuming process. Previous experience suggests that at least 1.5–2 years are required before the first tangible results emerge. Even if existing subsidy schemes that have already proven effective after a lengthy learning process — such as the Home Renovation Programme — continue to operate, additional schemes and targeted efforts will still be necessary to support the most vulnerable and socially deprived groups.

There is therefore a significant risk that the adverse impacts of ETS2 will materialise much earlier than the positive effects of structural interventions. **To mitigate this risk, direct income support financed through the Social Climate Plan could be considered for households most severely affected by ETS2**, such as low-income families living in certain types of buildings (corresponding to H–I energy performance categories) and relying exclusively on natural gas for heating.

1 INTRODUCTION - UNDERSTANDING ETS AND ETS2

1.1 How the ETS system works

The EU ETS is the EU's emission trading system, which was created in 2005, with the aim to reduce GHG emissions. The 27 EU member states are part of the system, plus Iceland, Liechtenstein and Norway. Since Brexit, only Northern Ireland from the UK and only for electricity production is included. The EU ETS is also linked to the Swiss ETS (EHR) since 2020, which means that any operator required to participate in the Swiss or EU ETS can use emission allowances from both their own system and that of the other to cover the relevant GHG emissions¹. The system operates in phases, we are currently in Phase 4 (2021-2030), Phase 1 was in 2005-2007, Phase 2 in 2008-2012, Phase 3 in 2013-2020.

The ETS covers about 40% of the EU's GHG emissions, because the system only covers certain sectors: heat and electricity generation, heavy industry, aviation (only since 2012, and only flights within Europe) **and maritime transport** (only since 2024). In some sectors only installations above a certain size are covered (like in case of district heating plants over 20 MW). From different GHGs, the system focuses mostly on CO₂, however N₂O and PFCs (perfluorocarbons) are also included, but only from certain sectors. Until 2023 emissions in the covered sectors were reduced by 47%.

ETS is a cap-and-trade system. **Each economic organisation that falls within the obligation of the ETS has to acquire allowances in line with the GHG emission they create.** Each tonne of CO₂ is equal to one allowance, thus lower emission means fewer number of allowances that have to be acquired. The allowances can be bought in the European auctioning market and in secondary markets. The price of one allowance is based on the balance between the demand and the supply. The demand is created by the economic organisations that have the obligation to buy allowances and the supply is based on a cautious forward-looking plan of the EU on how many allowances are released on the market.

There are two types of allowances: general allowances for heat and electricity generation, heavy industry and maritime transport, and aviation allowances for aviation. Allowances are distributed among member states based on their historical emissions, and the member states are the ones that officially put these allowances onto the auctioning market in line with a precise schedule on European level. **The EU introduces caps on the available allowances for every year, and this cap is constantly decreasing, which reduces the supply on the market and increases the price** in order to make incentives for the economic operators to reduce their GHG emissions, and meet the EU's climate target².

¹ https://climate.ec.europa.eu/eu-action/carbon-markets/about-eu-ets_en

<https://www.bafu.admin.ch/en/linking-the-swiss-and-eu-emissions-trading-systems>

² Until 2020, the annual reduction factor was 1.74%, since 2021, it is 2.2%. After the 2023 revision of the ETS Directive the reduction factor has been increased to 4.3% per year over the period 2024-2027 and to 4.4% per year from 2028, to achieve emission reduction by 62% by 2030 compared to 2005 levels.

A smaller part of allowances is allocated for free (though free allocation default in Phase 1 and 2). Mainly heavy industry sector is affected which is at the risk of carbon leakage, which means the transfer of CO₂ emissions from one country with strict climate policies to another country with weaker emission constraints, which can lead to an increase in global GHG emissions³. There are also some exceptions, like electricity producers in lower income member states, who can still receive free allowances for modernisation purposes despite the termination of this practice since Phase 3 in every other country. The installations eligible for free allocation usually get only part of their allocations for free, and they need to buy some allocations at auctions. Free allocation is based on performance benchmarks reflecting emission intensity, and benchmarks are also reduced by the Commission to encourage companies in each sector to decarbonise and advance innovation. Free allocation is planned to be gradually phased out between 2026-2032, mostly because it undermines the polluter pays principle, and results in a loss of revenue, since those allowances are not auctioned.

Since Phase 3 auctioning is the default method for regulated entities to get allowances that cover their emissions. Member states can auction the allowances on EEX (European Energy Exchange). Regulated entities can buy allowances directly from the auctions or through third parties, like banks or brokers, and can also trade between each other on secondary markets. Member states must spend all of their auctioning revenues on climate action and report it to the European Commission who monitors the spending. They are also required to provide visibility to their projects financed by ETS revenues. Since Phase 4, a part of allowances is also auctioned for some European funds, the Modernisation Fund, Innovation Fund, Recovery and Resilience Facility and Social Climate Fund, which all support climate action in different ways.

Entities covered in the ETS must buy enough allowances to cover their emissions. All regulated entities must open an account in the Union Registry operated by the European Commission, which keeps track of the ownership of allowances held in electronic accounts. Operators must monitor and report their emissions annually, and after they have to surrender enough allowances within the Union Registry to cover their emissions. If they cannot cover their emissions during the preceding year, they have to pay the price of the allowances plus a penalty. The penalty is currently 100 EUR. Penalties also go to the national budgets. Regulated entities can also trade allowances between themselves on the secondary market.

Figure 1 provides an overview about the ETS system, highlighting the main actors and mechanisms, and their relation to each other.

https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/eu-ets-emissions-cap_en

³https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/free-allocation/carbon-leakage_en

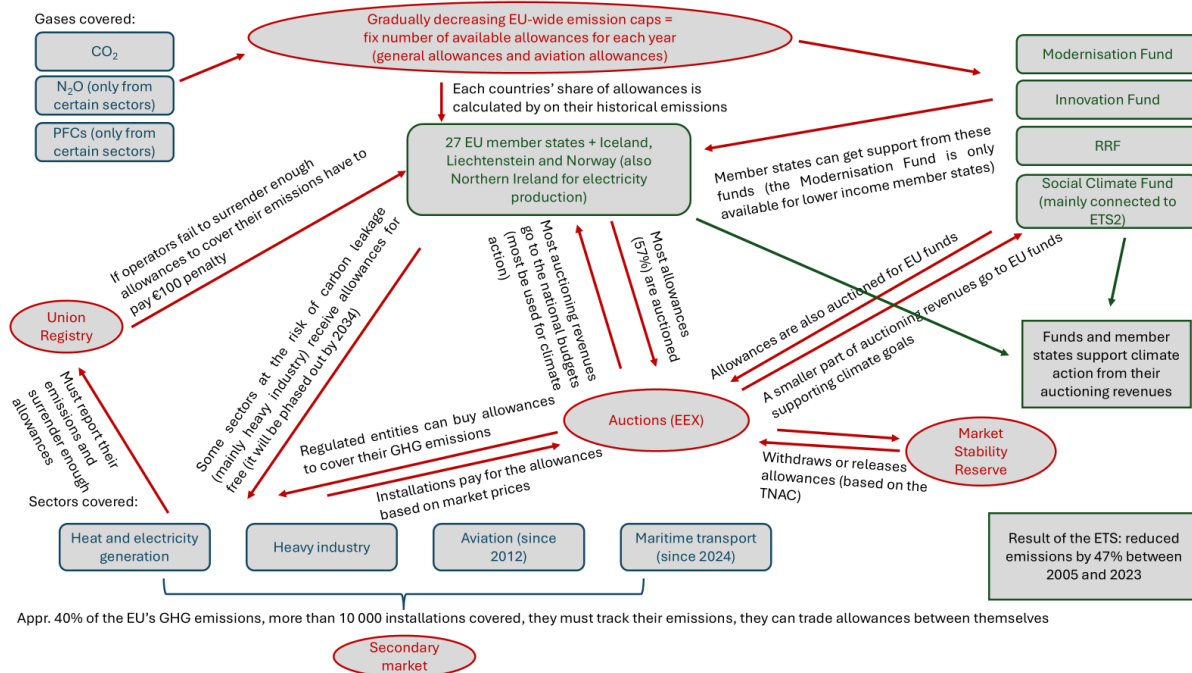


Figure 1. Overview of the EU ETS (own editing)

Finally, the Market Stability Reserve (MSR) was established in 2018 and began operating in 2019 to handle the surplus of allowances by balancing supply and demand. Because of the 2008 economic crisis and the influx of international credits (no longer permitted) a large surplus of allowances was created, which made carbon prices so low that there was little incentive for emission reduction. Part of the surplus of allowances was placed in the MSR. The MSR works based on the “total number of allowances in circulation” (TNAC) every year. When the TNAC exceeds 833 million, the MSR withdraws allowances from auctions, reducing supply in the EU carbon market. When the TNAC falls below 400 million, the MSR releases 100 million allowances for auction, increasing supply in the EU carbon market. Since 2023, allowances held in the MSR above a certain threshold are invalidated annually and are permanently removed from the system.

1.2 A step forward: introducing the ETS2 system

As part of the Fit for 55 package and the 2023 revisions of the ETS Directive, a new emissions trading system, ETS2⁴ was created, which would be a complementary and separate system from the existing EU ETS, with the possibility of merging the two systems in the future. The legal basis of the ETS2 is the 2023/959 Directive⁵ amending the ETS Directive. ETS2 is not yet in operation, it was planned to start in 2027, but it was recently postponed to 2028. It will complement other policies of the European Green Deal in the covered sectors, helping

⁴ https://climate.ec.europa.eu/eu-action/carbon-markets/ets2-buildings-road-transport-and-additional-sectors_en

⁵ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2023.130.01.0134.01.ENG

Member States achieve their emission reduction targets under the Effort Sharing Regulation⁶. The two systems (ETS and ETS2) are foreseen to cover 75% of the EU's GHG emissions.

The system was created to cover sectors, which had not been included in the existing EU ETS: the **road transport, the building sector and small industry**. The insufficient emission reductions in those sectors before could have hampered the EU's 2050 climate neutrality goal. Unlike the existing ETS, where end users (economic operators) are the regulated entities, **ETS2 will work based on the upstream logic, so fuel distributors are the regulated entities who supply the aforementioned sectors**, they will be required to monitor and report their emissions.

The fuels covered in the ETS2 are: (un)leaded petrol, oil, kerosene, LPG, natural gas, heavy fuel oil, coal and coke, so for example peat, wood and other biomass are not included⁷. The only GHG covered is CO₂.

The 27 EU Member States will be part of the ETS2, though some countries, including Hungary, were so far against the introduction of ETS2. The other EEA countries that are part of the existing ETS are also planned to be included in the ETS2.

Similarly to the existing ETS, the ETS2 is also a cap-and-trade system. The cap will be set to reduce emissions in these sectors by 42% by 2030 compared to 2005 levels. Regulated entities will have to buy their allowances at auctions to cover their emissions, however, **there will be no free allocation within the ETS2**. The ETS2 auctions will be separate from the auctions of the existing ETS, so carbon prices will also be different. Otherwise, the system will work similarly, so regulated entities have to register to the Union Registry, monitor and report their emissions, surrender enough allowances to cover their emissions, and pay the penalty if they are unable to do so. Regulated entities can also trade allowances between themselves on the secondary market. The penalty for non-compliance is still planned to be EUR 100 per tonne (which should be paid above the allowance costs).

75% of allowances within the system will be auctioned by the participating countries, the share of the countries' allowances will also be calculated based on their historical emissions in the covered sectors over 2016 to 2018⁸. **Member states will be required to spend all of their revenues on climate action and also on mitigating the social consequences of the energy transition**. The **remaining 25% of the allowances will be auctioned for the Social Climate Fund (SCF)**. The Fund was created to handle the potential social and economic burden of ETS2 by supporting vulnerable households and micro-enterprises who are most affected by energy and transport poverty. Member states need to prepare Social Climate Plans and also provide 25% co-financing to get funding from the SCF.

⁶ https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en

⁷ <https://www.epa.ie/our-services/licensing/climate-change/eu-emissions-trading-system-/eu-emissions-trading-system-2-ets2/>

⁸ <https://icapcarbonaction.com/en/ets/eu-emissions-trading-system-buildings-and-road-transport-eu-ets-2>

The introduction of the ETS2 has been causing political turmoil, with certain countries voicing their opposition. It was planned to begin operation in 2027, but was recently postponed to 2028. Nevertheless, preparatory works for the operation have already started, for example regulated entities have to apply for Greenhouse Gas Emissions Permit for ETS2 from 1 January 2025 on. They also have to prepare a monitoring and reporting plan and report their historical emissions starting 2024, which will serve as a baseline for calculating the cap for the first year. The monitoring and reporting also started in 2025⁹.

Figure 2 summarizes how the ETS2 operation is foreseen, including actors, mechanisms, sectors and fuel types covered.

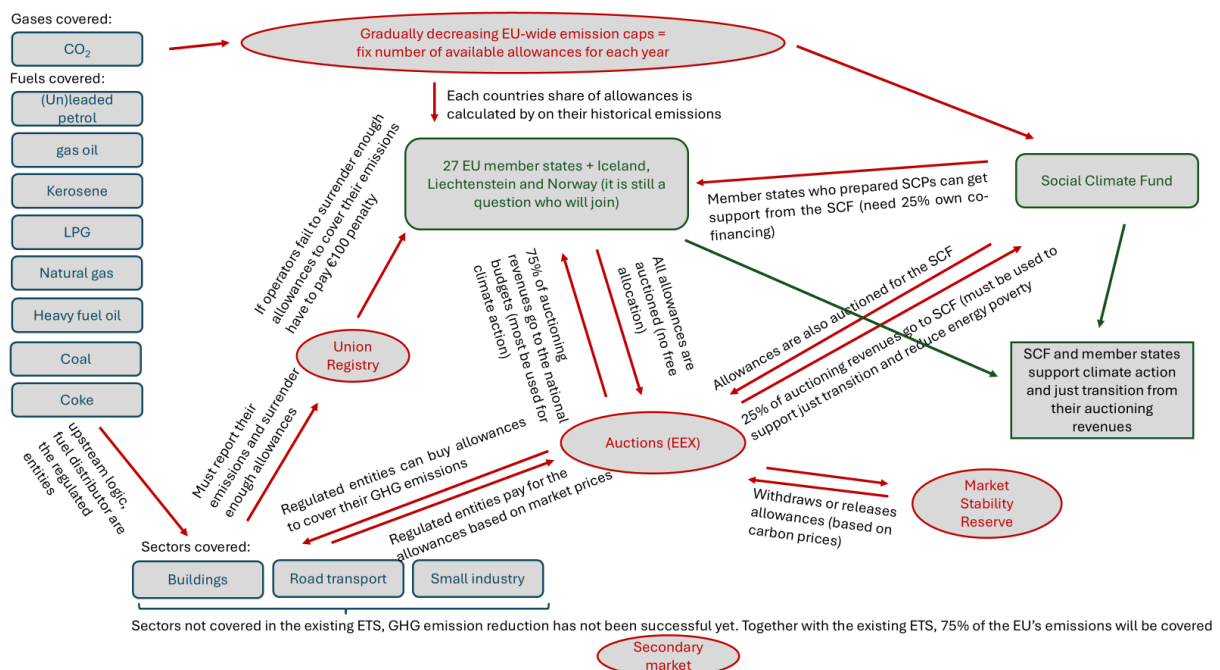


Figure 2. Overview of the ETS2 (own editing)

1.3 Solidarity Provision

The Solidarity Provision is part of the auctioning mechanism, it redistributes a share of the allowances to be auctioned during Phase 4. It is also connected to the Article 10c Derogation and the Modernisation Fund.

It means that 90% of the quantity of allowances to be auctioned are distributed among all Member States based on their emissions during the reference period, while 10% of allowances are allocated to 16 less wealthy Member States¹⁰. It was introduced in Phase 3 when

⁹ <https://www.epa.ie/our-services/licensing/climate-change/eu-emissions-trading-system-/eu-emissions-trading-system-2-ets2/>

¹⁰ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/auctioning-allowances_en

auctioning became the default method and was maintained in Phase 4. A novelty introduced in Phase 4, is the flexibility mechanism, which allows the 16 Member States to repurpose their solidarity allowances for Article 10c Derogation (up to 50%) and/or the Modernisation Fund (up to 100%) (ERCST & CEEP 2020).

Article 10c Derogation

Article 10c of the EU ETS Directive provides a derogation from the general rules that allow no free allocation to electricity production (electricity producers must buy all the allowances since 2013), and it allows the lower-income Member States to give free allocation to electricity generation from the amount already allocated to that Member State for auctioning with the aim to support modernisation and decarbonisation of their energy mix. This derogation was also introduced in Phase 3 and is maintained in Phase 4. Ten Member States are eligible for the derogation, which had in 2013 a GDP per capita below 60 % of the EU average. From these 10 Member States, in Phase 4 only three, Bulgaria, Hungary and Romania used the derogation, Czechia, Croatia, Lithuania and Slovakia decided to use the possibility to transfer all or parts of their Article 10c volumes to the Modernisation Fund, while Estonia, Latvia and Poland decided to auction their allowances in the traditional way.¹¹

With the use of the derogation up to 40% of the eligible Member State's allowances to be auctioned may be given to electricity production, but this can be increased to 60% by using the flexibility mechanism (ERCST & CEEP 2020).

1.4 Insecurities in the system

The introduction of the ETS2 and the potential energy price increase sparked a lot of debate in Europe, and finally it was decided to postpone it until 2028. **In 2026, the European Commission will address the EU ETS and review the ETS Directive** (including both the existing ETS and ETS2) through an evaluation and impact assessment process supported by stakeholder consultation, the update is expected by July 2026. The revision will address several issues, like the role of carbon dioxide removals, the expansion of the current scope to additional sectors (for example smaller energy installations below 20 MW thermal capacity, municipal waste incineration and landfills) and GHGs not yet covered by the ETS, new rules on how to account for non-permanent carbon capture and utilisation, and the risk of carbon leakage in sectors not covered by the Carbon Border Adjustment Mechanism (CBAM)¹², and from an international perspective, the EC would explore the criteria for linking the EU ETS with other carbon markets, the way it is already linked to the Swiss ETS (EPRS 2026). The Marked Stability Reserve and the use of EU ETS revenues generated through auctioning are also under review. It is planned that a bigger share of auctioning revenues will go to the EU budget and EU funds, and less to the national budget of member states during the 2028-2034 MFF (EPRS

¹¹ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/free-allocation/allocation-modernise-energy-sector_en

¹² https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en

2026). The gradual phase-out of free allocation and instead the implementation of the CBAM is also considered¹³.

ETS2 has also become a focal point of intense diplomatic manoeuvring led by Poland. As of early 2026, these efforts have already produced tangible outcomes, as the EU Council adopted amendments to the European Climate Law that delayed the full operation of ETS2 by one year, shifting its start date from 2027 to January 1, 2028. This adjustment reflects a central demand from Poland and a broader coalition of Eastern European member states, specifically the Visegrád 4 group (Poland, Czech Republic, Hungary, Slovakia), which argued that additional time was necessary to carry out “thermal modernization” and to shield households from abrupt increases in heating and fuel costs. **Despite this concession, both Warsaw and Prague continue to advocate for a more substantial delay, pushing for implementation to be postponed until at least 2030.**

At the national level, Poland has been the most vocal critic of the original ETS2 timeline, with Prime Minister Donald Tusk describing the 2027 launch as “very disadvantageous” for Polish citizens. Beyond advocating for a delay until 2030, Poland is also lobbying to retain free carbon allowances for industry in order to safeguard economic competitiveness, due to having one of the largest heavy industry sectors in the EU. Additionally, Warsaw succeeded in securing review clauses within the European Climate Law that would allow the EU to scale back its climate ambitions if key economic indicators - such as energy prices or unemployment - deteriorate significantly.

The Czech Republic has also played a prominent role, leading a coalition of 18 member states calling for modifications to ensure that ETS2 remains “socially bearable.” Prague has focused in particular on the introduction of price caps for carbon allowances in both the existing ETS (ETS1) and the forthcoming ETS2, aiming to prevent excessive price increases driven by financial speculation. While sharing many of Poland’s concerns, the Czech government has emphasized reforming the system from within rather than signalling any intention to withdraw from it.

At the same time, some of ETS’s most vocal supporters have also begun to amend their positions. Germany, most interestingly, was a key quiet supporter of the late 2025 decision to delay the start of the ETS2 regulatory phase from 2027 to 2028, driven by fears that high carbon prices would hit households just as the country faces critical regional elections. In the wider context, Germany’s current conservative government, pivoting from previous, green-influenced policies, is moving towards what they call a more pragmatic approach with regards to industry and national economics. Fuelled by pressure from heavy and chemical industries (highly significant as employers, GDP contributors, and political influencers), German leadership is, as of early 2026, actively lobbying for both free allocations to be maintained at their current level for a longer period (followed by a more gradual phase-out extending well beyond 2034,) as well as for slowing the pace of reducing the volume of new certificates

¹³ <https://ercst.org/event/2026-review-of-eu-ets-stakeholder-meeting/>

placed on the market and to postpone the complete phase-out of their allocation until as late as 2050.

This reflects not only a change of leadership, but that of public opinion as well, with polls showing that people regard everyday economics and immigration as the primary political issues, whereas only a few years ago climate protection outranked other concerns by a significant margin.

Reuters has also reported that Germany is not alone in this recent pivot and are finding allies in Italy and France to introduce more protections for select industries. The EU member states backed tighter price controls aimed at stabilizing ETS2 costs and addressing fuel price concerns. The proposed measures would permit the release of up to 80 million allowances annually if ETS2 prices rise above €45 per tonne of CO₂.

The delay of ETS2 carries important economic and financial implications across the European Union. **The Social Climate Fund (SCF), designed to mitigate the social impacts of carbon pricing, is expected to proceed as planned despite the postponement.**

Looking ahead, market dynamics remain a key concern. Analysts warn that once ETS2 becomes fully operational, the absence of free allocations could create supply scarcity in the carbon market. This, in turn, may drive allowance prices to historically high levels, potentially exceeding €100 per metric ton.

2 IMPACT OF THE ETS AND ETS2 SYSTEMS

The European Union Emissions Trading System (ETS) has generated measurable impact on both environmental outcomes and economic performance, making it one of the most empirically studied carbon pricing instruments globally. **Evidence indicates that the ETS has driven substantially larger emissions reductions in covered sectors than comparable regulatory frameworks**, while its effectiveness has varied across phases, sectors, and allocation regimes. In particular, emissions abatement has been strongest where carbon pricing interacted with complementary market structures and regulatory standards, such as in the power sector, while more limited incentives in industry and aviation—largely due to continued free allowance allocation—have constrained reductions. **At the firm level, the ETS has achieved emissions cuts without undermining competitiveness**, as reflected in stable employment and profitability alongside increased revenues, asset growth, and innovation. **At the same time, its broader economic impacts have become more pronounced in recent phases, with rising carbon prices contributing to inflationary pressures**, shifts in sectoral price dynamics, and measurable macroeconomic adjustments.

The introduction of the ETS system has led to a significant reduction of carbon emissions. Overall, it has been assessed that:

- the ETS has contributed to ~37–44% emission reduction in covered sectors since 2005 (the exact amount depends on UK inclusion), versus ~13% reduction in non-ETS sectors under Effort Sharing Regulation (the ESR establishes binding annual GHG emission targets for Member States from 2021 to 2030 regarding domestic transport (excluding aviation), buildings, agriculture, small industry, and waste, so in sectors that are not included in the EU ETS, the ESR aims to reduce GHG emissions by 40% by 2030¹⁴), showing strong relative effectiveness of carbon pricing in power/industry
- Efficiency gains were strongest where carbon price interacted with existing regulatory frameworks (e.g., power sector market design, industrial BAT standards¹⁵)

¹⁴ https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/about-effort-sharing_en

¹⁵ BAT (best available techniques) are applied in the chemical industry to cut the use and impact of hazardous chemicals. The EU's Industrial Emissions Directive sets out integrated environmental permit requirements for a wide range of large industrial activities, the environmental permit conditions to be based on best available techniques (BAT), which means the most environmentally effective and economically viable proven techniques within each industrial sector covered by the law, and are agreed in a procedure known as the 'Sevilla process' led by the EC JRC. For each covered sector BAT Reference Documents (known as BREFs) are available. <https://www.eea.europa.eu/en/european-zero-pollution-dashboards/indicators/best-available-techniques-bat-to-cut-the-use-and-impact-of-hazardous-chemicals>
<https://bureau-industrial-transformation.jrc.ec.europa.eu/reference>

- Carbon price pass-through varied strongly by sector:
 - High in electricity markets (near full pass-through in liberalized markets)
 - Lower and more uneven in industry depending on exposure to global competition

Looking into more details we can see a more nuanced impact pattern, which distinguishes between phases, and also takes account of different economic consequences. Dechezlepretre et al. (2023) analysed how the introduction of the ETS in 2005 affected emissions and the competitiveness of the regulated entities during Phase 1 and 2, so between 2005 and 2012. They confirmed that the introduction of the EU ETS was associated with a statistically significant reduction of carbon emissions between 2005 and 2012, and it was only partially caused by the 2008 economic crisis, the ETS was effective in itself. On the contrary, ETS led to a statistically significant increase in revenue and in fixed assets of regulated firms, and did not have a statistically significant impact on regulated firms' number of employees and profit. **So the ETS in its first and second phases, led to emissions reductions without negatively affecting the economic performance of regulated firms and their competitiveness**, and it further increased innovation. From their research, it also turned out that less generous allocation of free allowances probably creates a stronger incentive to reduce emissions, because under-allocated installations usually reduce emissions to a larger extent.

During Phase 3, emissions have been significantly under the cap, so the 40% reduction target for 2030 was already reached in 2020. Emissions reductions were mainly caused by reductions in the electricity and heating sectors, while industrial emissions have not decreased significantly, and aviation emissions have even increased (except for 2020). The main reason for this difference is that the power sector has to pay for most of the allowances since Phase 3, while aviation and industry still receive large amounts of allowances for free, so there is no strong incentive for decarbonisation. Emissions from electricity and heat production have dropped sharply during the last decade, because the GHG intensity of electricity production developed significantly after the introduction of the ETS and the spread of renewable energy sources. (LIFE ETX, 2024)

In correlation, inflation rates within the Eurozone have also been affected by the shocks to carbon policy, as shown by historical decomposition analysis. According to econometrical research, **“carbon prices account for a significant portion of the variation in inflation rates following the introduction of Phase 4 in 2021**. This contribution is marked and enduring for energy and non-durable goods, but more restrained for other components.” The author uses this as evidence to suggest unwarranted optimism on behalf of the European Commission to introduce Phase 4 without fully taking into account global and transnational crises that had translated into economic shocks (Covid pandemic, Russia-Ukraine war). Carbon tightening also affected industrial goods more than services, but modestly, with Transportation, Utilities, and Food seeing the highest pass-through, while Communications prices fell after two years. In

summary, higher carbon prices raise inflation, reduce output, increase unemployment and trade deficits, and negatively impact markets, lowering stocks and raising debt yields.¹⁶

2.1 Predicted impacts of ETS2

Energy efficiency policies at both EU and national levels are expected to play a decisive role in shaping EU ETS2 price dynamics. In general, the more stringent these complementary policies are - such as building renovation requirements, insulation standards, and heating system upgrades - the lower the resulting ETS2 carbon price tends to be. This is because improved energy efficiency directly reduces emissions demand within the system, thereby lowering the need for costly carbon allowances. At the same time, these dynamics carry significant distributional implications across households and regions, as the effects depend heavily on national circumstances, including the quality of housing stock, the prevailing heating mix, and income distribution patterns.

Modelling results suggest that EU ETS2 prices could fall within a wide range of approximately €45 to above €200 per ton of CO₂, depending largely on the assumed stringency of accompanying energy efficiency measures. However, the effectiveness of ETS2 is not determined by the carbon price level alone. **A critical factor is how revenues from the system are recycled back into the economy, particularly in terms of compensating vulnerable households and supporting low-carbon investments.** In this context, distributional outcomes are highly sensitive to national structural characteristics, and the political sustainability of ETS2 depends on whether citizens perceive the system as fair and whether compensation mechanisms are implemented quickly and visibly.

From a market design perspective, modelled ETS2 price trajectories indicate a strong likelihood that built-in price stability mechanisms will be activated. **The system includes three main stabilization tools.** The first is a quantity-based adjustment mechanism, often referred to as MSR2, which operates based on the Total Number of Allowances in Circulation (TNAC). If the TNAC falls below 210 million allowances, approximately 100 million allowances are released into the market, whereas if it exceeds 440 million, a similar volume is withdrawn into the reserve. This mechanism is intended to stabilize supply in response to market tightness or surplus. **The second mechanism is a fixed price-level trigger set at around €45 per ton of CO₂ until 2030, adjusted for inflation.** If the market price exceeds this threshold for roughly two consecutive months, up to 20 million allowances can be released, with this intervention allowed up to twice per year. This implies a maximum additional supply of about 40 million allowances annually through this channel. The third mechanism addresses rapid price spikes through ratio-based triggers. If prices rise to roughly 1.5 to 2 times the previous six-month average, around 50 million allowances may be released, while a tripling of the average price could trigger the release of approximately 150 million allowances.

¹⁶ H Morão, From carbon policy to consumer prices: The economic impact of carbon caps in the Euro Area, Energy Economics, Volume 143, 2025

Importantly, there are constraints on how these mechanisms interact. Only one price-based mechanism can be activated within a 12-month period, effectively capping the maximum additional supply from such tools at around 150 million allowances per year. Furthermore, the overall size of the MSR2 buffer - initially estimated at around 600 million allowances - places a hard limit on the total stabilization capacity available over the current decade.

Taken together, these mechanisms are designed to dampen extreme price volatility but are not sufficient to fully counteract strong underlying scarcity in the carbon market. Supply injections are both limited in scale and subject to timing lags, meaning that sustained upward pressure on prices cannot be entirely neutralized. This becomes particularly relevant when considering the carbon price levels required to meet the EU's 2030 climate targets. Estimates suggest that achieving these targets would require prices in the range of €130 to €286 per ton of CO₂ within the existing EU ETS, and even higher levels - between €175 and €360 per ton - in sectors covered by the Effort Sharing Regulation (ESR). **Consequently, if ETS2 prices remain below the indicative cap of €45 per ton of CO₂, it is unlikely that emissions reduction targets can be met through carbon pricing alone, underscoring the necessity of strong complementary policies.**

At such elevated price levels, emissions in the transport and buildings sectors are projected to decline significantly; by roughly 40% by 2030 compared to 2005 baseline levels. However, these environmental gains would come with notable economic side effects, **particularly for consumers, as average diesel and gasoline prices in road transport would increase by 22% and 18% respectively, while building-related energy use could increase by as much as 33%,** placing additional pressure on household budgets and operating costs.

	Heating solid	Heating gas	Heating oil	Transport fuel
Austria (AUT)	0.2 %	12.3 %	20.6 %	15.3 %
Belgium (BEL)	1.7 %	18.8 %	26.4 %	14.3 %
Bulgaria (BGR)	3.0 %	25.5 %	23.9 %	18.2 %
Croatia (HRV)	0.1 %	44.9 %	29.3 %	16.3 %
Cyprus (CYP)	0.0 %	18.6 %	23.3 %	16.2 %
Czech Republic (CZE)	21.3 %	15.5 %	24.1 %	15.8 %
Denmark (DNK)	0.0 %	14.1 %	13.5 %	12.2 %
Estonia (EST)	0.1 %	21.5 %	21.9 %	14.6 %
Finland (FIN)	0.1 %	9.5 %	17.4 %	12.3 %
France (FRA)	0.1 %	17.4 %	19.7 %	13.8 %
Germany (DEU)	1.4 %	15.1 %	24.1 %	13.4 %
Greece (GRC)	0.1 %	18.6 %	19.6 %	12.6 %
Hungary (HUN)	4.9 %	60.5 %	15.4 %	15.2 %
Ireland (IRL)	27.1 %	13.5 %	24.4 %	14.8 %
Italy (ITA)	0.0 %	16.2 %	16.1 %	13.4 %
Latvia (LVA)	0.1 %	17.0 %	21.9 %	15.4 %
Lithuania (LTU)	2.0 %	11.7 %	26.0 %	16.6 %
Luxembourg (LUX)	0.5 %	13.9 %	26.6 %	16.1 %
Malta (MTL)	0.0 %	18.6 %	25.7 %	19.1 %
Netherlands (NLD)	0.0 %	11.5 %	26.4 %	12.7 %
Poland (POL)	31.4 %	27.8 %	20.4 %	16.9 %
Portugal (PRT)	0.0 %	14.5 %	15.7 %	15.1 %
Romania (ROU)	0.4 %	36.5 %	18.5 %	17.4 %
Slovak Republic (SVK)	8.1 %	16.4 %	24.1 %	14.9 %
Slovenia (SVN)	0.0 %	19.9 %	22.6 %	15.1 %
Spain (ESP)	0.7 %	18.6 %	23.7 %	15.6 %
Sweden (SWE)	0.0 %	9.5 %	22.2 %	13.3 %

Figure 3. Fossil fuel price increase for households with an ETS2 price equal to 100€. Source: Perdana et al. 2026

According to scenario analyses conducted by Bloomberg, implementing structural interventions in electrification and low-carbon technologies could reduce carbon prices to a range of approximately €70–85 per ton of CO₂ while still achieving comparable emissions reductions. More notably, a coordinated policy mix that combines elements of all three approaches - supply adjustments, demand-side support measures, and complementary regulations - could lower prices even further, potentially to around €45/tCO₂. This would represent a substantial reduction in cost burden while preserving environmental outcomes.

In such a combined-policy scenario, it is estimated that roughly **one-third of ETS2-generated revenues would need to be reinvested into subsidy schemes to support clean energy adoption**. Additionally, more dynamic and responsive adjustments to the MSR would be required to ensure market stability and maintain an effective balance between supply and demand in the carbon market over time.

Predicted ETS2 impact on buildings: Example of Romania

According to a study (EPG, 2025), the impact of the ETS2 in the buildings sector in the period of 2027-2030 is estimated to be between RON 49 (if the price of an allowance is 55€) and RON 76 (if the price of an allowance is EUR 86€), so between 14% and 22%, price increase a month for a household with a medium gas consumption of 100 m³.

The population in the lowest income decile mainly use biomass for heating, so they may only be indirectly affected by the ETS2. The price increases are expected to impact especially the lower middle-income groups that use gas for heating and for whom energy bills still represent a significant part of their monthly expenditures. Most vulnerable households are located in the small towns dominated areas, where the district heating system was decommissioned and the only heating option was individual natural gas boilers. The impact of the ETS2 can also vary based on the energy performance of the building, affecting twice as much the unrenovated buildings, so building renovations can halve the impact incurred in the energy bill. The installation of heat-pumps can also significantly decrease the energy bill, it is estimated that the annual costs for heating and cooling of an average dwelling can be almost three times higher in an unrenovated gas-heated building compared to those that are retrofitted and heated electrically.

Romania is a net receiver from the SCF, so receives more than it pays. It is expected to get approximately EUR 6 billion from the SCF by 2032, and 9 billion from ETS2 by 2030, the total number of beneficiaries can vary between 1.6 and 2.9 million people based on how much is spent on direct income support.

A government decision in October 2025, transposed the revised ETS directive with a delayed start for 2031, which poses risks and implies heavy financial losses from the SCF and ETS2, therefore delaying crucial investments that would help vulnerable households.

3 MITIGATING THE IMPACTS - FUNDING MECHANISMS CONNECTED TO THE REDISTRIBUTION OF ETS AND ETS2 ALLOWANCES

There are several EU funds supported by ETS auctioning revenues, these also help the redistribution of the revenues and support those who are most impacted by the ETS. The Modernisation Fund is only available for lower-income member states, and it supports the modernisation of their energy systems, which helps to reduce GHG emissions, therefore reduces the need to buy allowances. The other funds are available to all member states. The Innovation Fund supports very innovative low-carbon technologies that can really move forward emission reduction. From 2023, some allowances are also auctioned for the Recovery and Resiliency Facility to support the REPowerEU Plan. The Social Climate Fund is not yet active, since it will be mostly supported by ETS2 revenues, but the existing ETS also raises revenues for it. It will support vulnerable households, transport users and micro-enterprises that are most exposed to increasing energy prices due to the ETS2, and do not have their own resources to mitigate the impacts.

3.1 Funds supported by ETS revenues

Modernisation Fund

The Modernisation Fund¹⁷ was established in 2018 and introduced for Phase 4 **to support the modernisation of energy systems, the improvement of energy efficiency and just transition in 13 lower-income Member States** (Bulgaria, Czechia, Estonia, Greece, Croatia, Latvia, Lithuania, Hungary, Poland, Portugal, Romania, Slovenia and Slovakia). The Modernisation Fund operates under the responsibility of the beneficiary Member States, who work in cooperation with the EIB and the EC. Member States have an allotted share that can be spent in the country, they can select investments and are responsible to monitor the implementation. They can use the Fund to finance individual projects, newly developed financing schemes or co-finance existing schemes (ERCST & CEEP 2020). Member States select projects they would like to fund and send this list to the EIB, European Commission and the Investment Committee (composed of the EIB, EC and Member States) that can decide what can be financed (LIFE ETX, 2024).

The fund supports investments in six priority areas:

1. generation and use of energy from renewable sources, including renewable hydrogen
2. heating and cooling from renewable sources
3. the reduction of overall energy use through energy efficiency, including in industry, transport, buildings, agriculture and waste

¹⁷ https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/modernisation-fund_en

4. energy storage and modernisation of energy networks, including demand-side management, district heating, grids for electricity transmission and the increase of interconnections between Member States
5. support for low-income households, including in rural and remote areas, to address energy poverty and to modernise their heating systems and infrastructure for zero-emission mobility
6. just transition in carbon-dependent regions to support redeployment, reskilling and upskilling of workers, education, job-seeking initiatives and start-ups

Besides these priority areas, a maximum 20% of the fund can also support non-priority investments. It is the responsibility of EIB to assess investments and confirm their priority status.

The Modernisation Fund is financed by revenues from the auctioning of emission allowances under the ETS. This means 2% of the revenues from auctioning of allowances during Phase 4 (revenues from the auctioning of 2.5 % of the allowances auctioned between 2024 and 2030). By using the flexibility mechanism, eligible Member States can also transfer allowances to the Modernisation Fund from the Solidarity Provision or the Article 10c Derogation. The total revenues of the Modernisation Fund are around €57 billion in Phase 4, assuming a carbon price of €75/tCO₂.¹⁸

Innovation Fund

The Innovation Fund was also set up for Phase 4 with the aim to **finance innovative low-carbon or net-zero technologies**. The Fund focuses on highly innovative clean technologies and big flagship projects which can significantly decrease GHG emissions, but support is also available for small-scale projects¹⁹. The areas covered by the Fund are renewable energy, energy storage, carbon capture and storage (CCS), carbon capture and utilisation (CCU) and cross-cutting projects²⁰.

Unlike the Modernisation Fund, the Innovation Fund is available to all the states that are part of the EU ETS (EU countries plus Norway, Liechtenstein and Iceland) and supports projects in the sectors covered under the ETS. It is also financed by revenues from auctioning allowances from the ETS and will provide approximately €40 billion (from 530 million allowances, calculated by using a carbon price of €75/tCO₂, but the total amount of the Innovation Fund depends on carbon prices) of support for projects during Phase 4²¹.

¹⁸ Revenues from the auctioning of 2.5 % of the total quantity of EU ETS allowances auctioned between 2024 and 2030

¹⁹ https://cinea.ec.europa.eu/programmes/innovation-fund_en

²⁰ <https://www.euinnovationfund.eu/innovation-fund>

²¹ <https://www.euinnovationfund.eu/>

The Fund awards grants through regular calls for proposals and competitive bidding procedures (auctions). The competitive bidding mechanism was introduced in 2023²². In the case of regular grants, the Fund supports up to 60% of the relevant costs, in the case of competitive bidding, the support can be 100%²³. The implementing body of the Innovation Fund is the European Climate, Infrastructure and Environment Agency (CINEA).

Connection to REPowerEU

From July 2023 to August 2026 some part of the Member States' auctioning share and part of the Innovation Fund budget are redirected to the Recovery and Resilience Facility to raise €20 billion for the REPowerEU Plan, which aims to phase out Russian fossil fuel imports, after the hardships and global energy market disruption caused by Russia's invasion of Ukraine²⁴. This also includes reducing the overall reliance on fossil fuels, and the promotion of renewables and hydrogen, improving energy efficiency which help to reduce demand, so not only the diversification of fossil fuel supplies and routes²⁵.

3.2 Funds supported by ETS2 revenues

Social Climate Fund

The Social Climate Fund²⁶ is a new EU fund, which was created alongside the ETS2 with the aim to ease the potential social and economic burden of ETS2 and ensure a fair transition to climate neutrality by supporting vulnerable groups, especially households and micro-enterprises who are most affected by rising energy and transport costs as Europe moves towards climate neutrality²⁷. The Fund will support investments aimed at reducing GHG emissions from heating systems and road transport, but a portion of it can also provide temporary direct income support. SCF will support households that struggle to keep their homes warm (energy poor), people who cannot afford the transport they need, and small family-run businesses and micro-enterprises with high energy or fuel transport costs. It will finance measures and investments connected to greener homes (including renovating buildings to improve insulation and energy-efficiency, replacing outdated heating, cooling and cooking systems with cleaner options, installing renewable energy sources in buildings), greener transport (including electric public transport and shared mobility) and giving temporary income support (maximum 37.5% of the SCP's budget can be allocated to direct income support, and it must be phased out).

Member States have to prepare Social Climate Plans to have access to the funding. The Plans have to be developed through consultations with local authorities, social partners and civil

²² https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/competitive-bidding_en

²³ https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/what-innovation-fund_en

²⁴ https://commission.europa.eu/topics/energy/repowereu_en

²⁵ <https://www.consilium.europa.eu/en/policies/repowereu-plan/>

²⁶ https://employment-social-affairs.ec.europa.eu/policies-and-activities/funding/social-climate-fund_en

²⁷ https://employment-social-affairs.ec.europa.eu/policies-and-activities/funding/social-climate-fund_en

society, and they have to include their planned measures and investments in 2026-2032 to support those most affected by the green transition. The Plans need to be submitted to the European Commission that assesses them and releases payments based on achieved milestones and targets. The initial deadline for submitting the Social Climate Plans was June 30, 2025, however most member states have not yet prepared their plans. Only Sweden's plan was adopted²⁸, Latvia, Lithuania, the Netherlands, Croatia, Greece and Malta submitted their plans, they are currently under assessment²⁹.

The SCF will mostly be funded from the revenues from the ETS2 auctions, 25% of the revenues will go to the SCF. However, since 2025, the EU ETS also raises revenues for the Social Climate Fund, in 2025, it raised 2.9 million EUR from auctions. Altogether 50 million allowances from ETS are planned to be auctioned for SCF, and at least 150 million allowances from ETS2. The EU's contribution from the ETS and ETS2 revenues is capped at 65 billion EUR, so if allowance prices rise, the remaining part will go to national budgets, if the 65 million is not reached, additional allowances from ETS2 might be auctioned³⁰. An additional 25% co-financing from Member States is required, and with that the Fund is expected to mobilise at least EUR 86.7 billion between 2026 and 2032³¹. The SCF was planned to start operating in 2026, so support would be available before the ETS2 starts, however, the postponement of the ETS2, the debates around it, and the delays in the preparation of the Social Climate Plans make its future uncertain.

The SCF allocates a varied amount to every member state, based on an assessment of need, taking into consideration the population at risk of poverty living in rural areas; carbon dioxide emissions from fuel combustion by households; the percentage of households at risk of poverty with arrears on their utility bills; total population; the Member State's GNI per capita in PPS; the share of reference emissions (2023/955 EU Regulation). Based on this, Poland, France, Italy, Spain and Romania will receive the most funding. Hungary is the 8th regarding funding, 4.33% of the total funding will go to Hungary, which is 2.8 billion €, and it will be complemented by the 25% national co-financing.

²⁸https://employment-social-affairs.ec.europa.eu/news/commission-endorses-swedens-eu500-million-social-climate-plan-support-vulnerable-households-clean-2025-12-11_en

²⁹https://employment-social-affairs.ec.europa.eu/policies-and-activities/funding/social-climate-fund/social-climate-fund-national-plans_en

³⁰ <https://carbonmarketwatch.org/2023/12/07/settling-the-bill-who-must-pay-for-their-emissions/#:~:text=As%20the%20total%20funding%20of,ETS2%20prices%20may%20exceed%20this.>

³¹ https://climate.ec.europa.eu/eu-action/carbon-markets/ets2-buildings-road-transport-and-additional-sectors_en#good-measures-to-decarbonise-ets2-sectors

4 HUNGARY: THE CASE OF ETS AND ETS2

4.1 Effects of the ETS

Based on interviews with ETS experts and the lack of news about price increase caused by the existing EU ETS (while there have been a lot of news about the expected impacts of ETS2 recently), it can be estimated that **Hungary has not been heavily affected by the EU ETS so far**, for several reasons. Firstly, the price of an allowance was not very high until the last couple of years. The proportion of electricity generated by fossil fuels is relatively low in Hungary, therefore it was not affected by the ETS. More than 40% of the electricity is produced from nuclear energy, the share of renewables is now higher than 30%, mostly solar energy, so the share of fossil fuels in electricity production is around 25%, mostly natural gas³². Moreover, as a lower-income EU member state, Hungary can use, and uses, the Article 10c Derogation, therefore can give free allocation to energy producers, which is not permitted to higher-income member states. Free allocation is still dominant in heavy industry, and ETS Directive also makes it possible to provide aid for electricity-intensive industries for indirect carbon costs from ETS revenues. In Hungary, household energy bills have been kept low with the 'utility cost reduction' programme since 2013, so **consumers do not pay market prices, therefore do not feel the direct impacts of the ETS**, though the government needs a remarkable amount of funding to keep the prices low.

4.2 How ETS revenues have been generated and used so far?

In 2023, about 30% of ETS revenue was reported to have been spent on climate action and energy transition. Most of that amount was allocated to implementation of a residential PV and storage support programme via NFFKÜ International Development and Resource Coordination Agency (€104.6 million). In 2024, according to EEA, Hungary only spent approximately 20% of its auctioning revenues on climate action, in 2025 it was around 27% though some of the revenues can be spent later, and it is also possible to spend revenues from earlier years in a given year³³.

In 2024, the category of **energy supply, grids, and storage clearly emerges as the dominant area within spending**, both in terms of frequency and financial allocation. With 45 entries – representing approximately two-thirds of all data – and total funding of around €126 million, it accounts for the overwhelming majority of recorded measures. This concentration indicates a strong and deliberate prioritization of supply-side interventions. The underlying investment pattern suggests a strategic focus on renewable energy deployment, expansion and modernization of electricity grids, and the development of energy storage systems.

³² <https://mekh.hu/eves-adatok>

³³ <https://www.eea.europa.eu/en/analysis/indicators/use-of-auctioning-revenues-generated#:~:text=Emissions%20Trading%20System-Billion%20EUR,heating%20and%20cooling%20in%20buildings>
<https://reportnet.europa.eu/public/dataflow/1527>

Collectively, these elements point toward a systemic approach to decarbonization centered on transforming the energy backbone of the economy.

The road transport (cars and trucks) category constitutes the second most significant area, though it remains substantially smaller in scale compared to energy supply. With 12 entries and approximately €40.5 million in allocated funding, it represents a clear but secondary policy priority. The distribution of measures suggests a targeted emphasis on transport decarbonization, most likely through support for electric vehicle adoption and related infrastructure. While important, the comparatively lower level of investment indicates that transport is positioned as a complementary pillar rather than a central driver of the overall decarbonization strategy.

In the case of energy efficiency in buildings, the dataset reflects a moderate level of engagement. This category includes eight entries and accounts for roughly €35.6 million in funding, placing it in a third-tier position. The types of measures implied – such as building retrofits, improved insulation, and upgrades to heating systems – suggest a focus on reducing energy demand and improving end-use efficiency. Although these interventions are critical for long-term emissions reduction, particularly in the buildings sector, their relatively smaller share of funding indicates that they are not prioritized to the same extent as large-scale infrastructure investments.

The LULUCF (land use, land-use change, and forestry) and agriculture category plays only a minor role within the dataset. With just four entries and total funding of approximately €5.1 million, its contribution is limited both in scope and financial weight. This suggests that nature-based solutions and land-use-related mitigation measures are not central components of the current policy mix, at least within the context captured by this data.

Finally, international climate finance is virtually negligible in this dataset. Represented by a single entry with funding of around €63,000, it accounts for an almost insignificant share of total allocations. This indicates that the overall spending approach is overwhelmingly domestically oriented, with minimal emphasis on external climate financing or international support mechanisms.

Taken together, the distribution across categories reveals a highly concentrated investment strategy, with a dominant focus on energy infrastructure, supported by more limited interventions in transport and buildings, and only marginal attention to land use and international climate finance.

As part of the 13 lower income member states, Hungary is also eligible for the Modernisation Fund. From the allowances auctioned for the Fund, 32,647,238 will be auctioned to support Hungary, between 2021 and 2025 Hungary got approximately 543 million €³⁴. Most funding

³⁴ <https://www.modernisationfund.eu/investments-2/>

has been allocated to the **modernisation and the green transition of district heating systems so far**³⁵. Energy distributors also got funding to install energy storage systems³⁶.

4.3 Who will be affected by ETS2 the most?

When preparing their Social Climate Plans, Member States were required to define energy poverty and vulnerability. According to the EU Regulation 2023/955 establishing the Social Climate Fund, energy poverty means a household's lack of access to essential energy services that underpin a decent standard of living and health, including adequate warmth, cooling, lighting, and energy to power appliances, in the relevant national context, existing social policy and other relevant policies. And vulnerable households mean households in energy poverty or households, including low income and lower middle-income ones, that are significantly affected by the price impacts of the inclusion of greenhouse gas emissions from buildings within the scope of Directive 2003/87/EC and lack the means to renovate the building they occupy. In Chapter 6.2, the definitions by different countries that already prepared their SCPs are collected. It turned out that energy poverty and vulnerability are not easy to define, and the definitions by different countries can also be different, but both energy poverty and vulnerability are usually linked to some household income threshold.

In conceptualising who may be affected most by the introduction of ETS2 in Hungary we have to take into account two major dimensions: 1) the ones that use natural gas a primary heating source, and in addition 2) the ones who live in buildings of low energy performance. To better understand the expected impacts of the ETS2 on the Hungarian housing stock and its territorial differences we examined a database from the 2022 Hungarian Census about the housing stock, including the type of heating in the apartments/houses, the energy efficiency rating of the apartment, the type of settlement where the apartment is located, the region of the apartment, the construction period, and some socioeconomic data about the households.

For the analysis, we focused on apartments and family houses **heated exclusively with natural gas and have low energy efficiency rating (H-I³⁷)**, because we expect that these households will be most impacted by the ETS2. From the 4 580 538 Hungarian housing units, there are 1 450 320 apartments which have H-I energy rating and are heated exclusively with gas, so almost one third of the apartments and houses are expected to be significantly impacted by the ETS2, though 12% of the gas heated, low energy rated apartments are vacant.

If we examine the type of houses and apartments, it turns out that more than half of the apartments or houses with H-I energy rating and gas heating are occupied family houses which

³⁵ <https://kormany.hu/hirek/100-milliard-forintnyi-beruhazas-gyorsithatja-fel-a-tavhohalozat-korszerusiteset>

³⁶ <https://mvmhalozat.hu/aram/oldalak/60705>

³⁷ The Hungarian Central Statistical office working in cooperation with the Hungarian Energy Efficiency Institute implemented a pilot methodology (<https://www.ksh.hu/s/kiserleti-statisztika/kiadvanyok/a-magyar-lakasallomany-primerenergia-igenyenek-becslese>), in which the census data was directly linked to the database of energy certificates on an address level, and using AI based statistical learning mechanisms the attributes of the specific energy performances were extrapolated to the stock that did not have an EPC yet. By means of this methodology, all housing items in the Census of 2022 received a modelled EPS rating.

are 80 m² or larger, and another 25% of them are occupied family houses that are smaller than 80 m² (Figure 4). And a relatively low number of the examined houses and apartments are in condominiums and cooperative buildings. Prefabricated housing complexes, where gas heating is uncommon and the technical standards were originally higher, are practically out of the impact scope of ETS2.

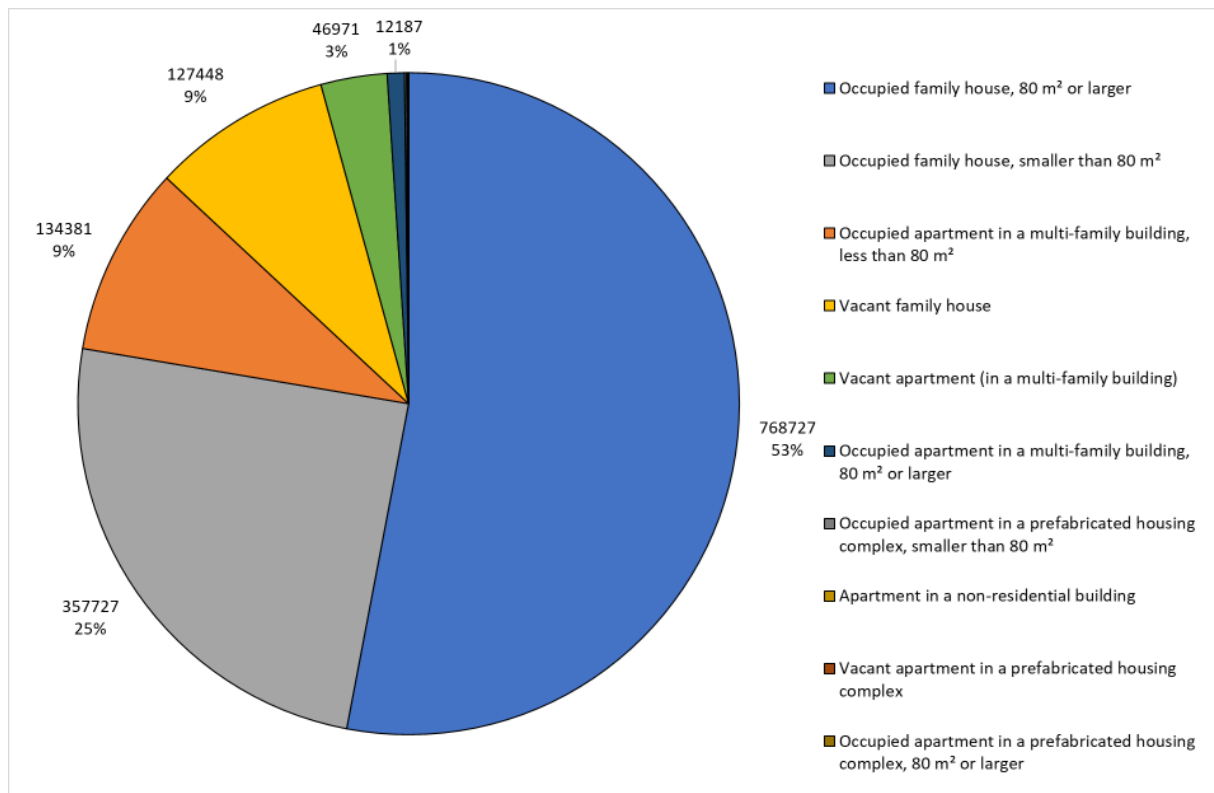


Figure 4. The distribution of houses and apartments with H-I energy efficiency rating and gas heating across housing categories. Data source: 2022 census based on the model by KSH and MEHI

If the proportion of apartments with H-I energy rating and gas heating from the whole housing stock across the different housing categories is examined, it turns out that vacant houses are most likely to have low energy rating and gas heating, closely followed by occupied houses that are smaller than 80 m² and occupied houses that are larger than 80 m². In these three building categories the share of houses with gas heating and low energy rating is more than 40% (in more detail see in Annex 6.3).

Then the distribution of apartments and houses with H-I energy efficiency rating and gas heating across settlement types was also examined. Data shows that 40% of such houses and apartments are in villages, and another 36% are in smaller cities, less than 25% of apartments with low energy rating and gas heating are located in bigger cities, so in Budapest, county seats or cities with county rights (Figure 5).

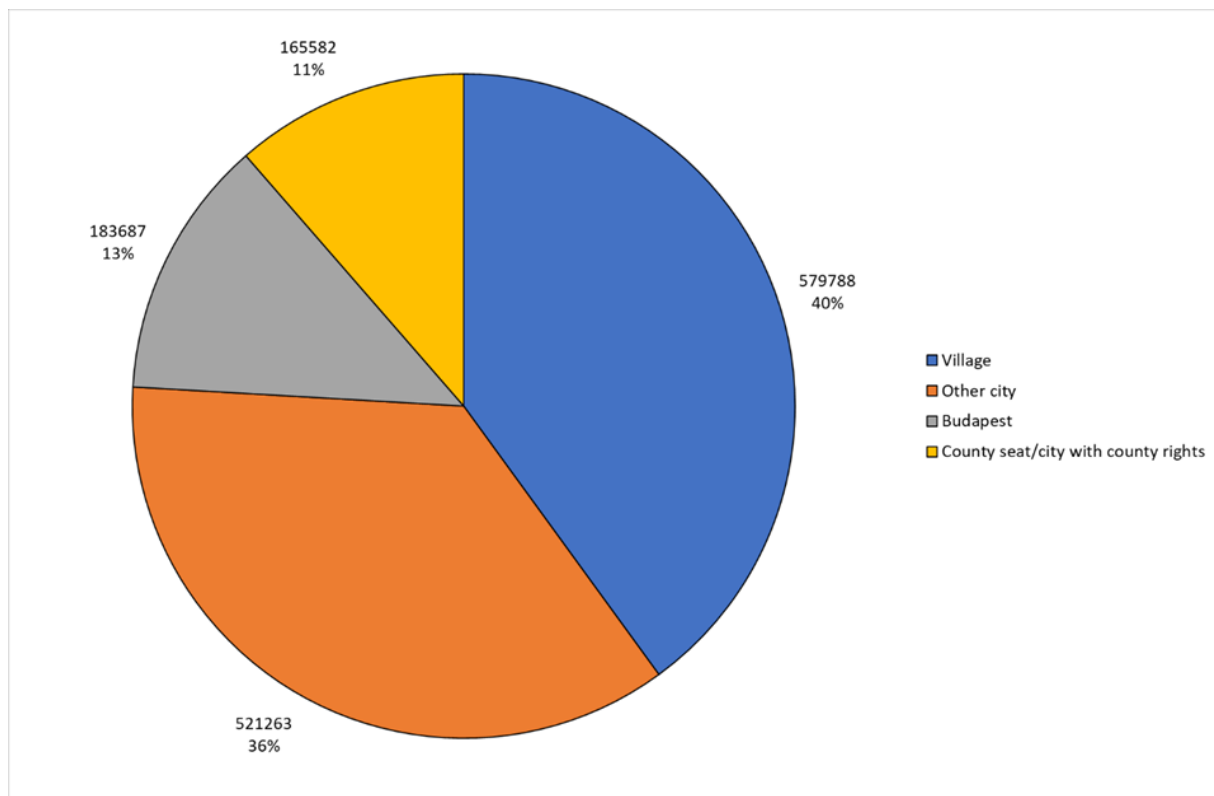


Figure 5. The distribution of apartments and houses with H-I energy efficiency rating and gas heating across settlement types. Data source: 2022 census based on the model by KSH and MEHI

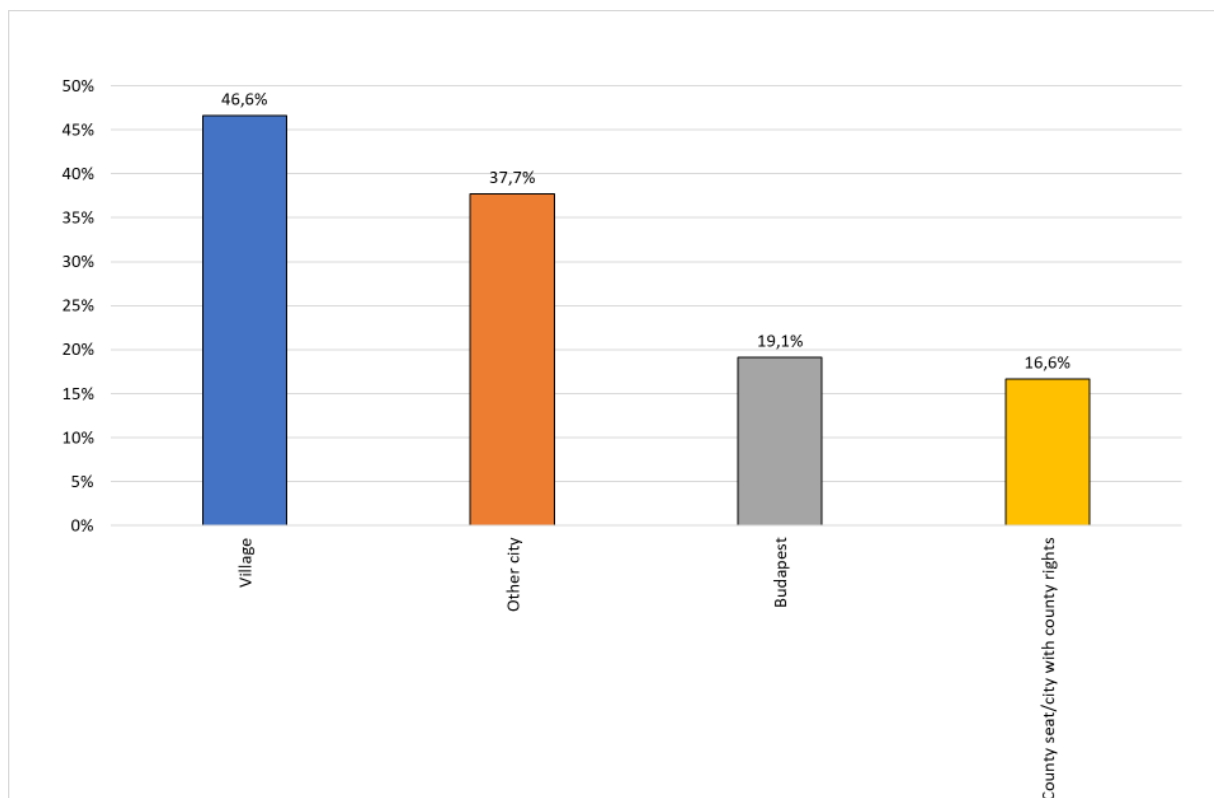


Figure 6. The share of houses and apartments with H-I energy efficiency rating and gas heating from the housing stock across settlement types. Data source: 2022 census based on the model by KSH and MEHI

In villages almost half of the apartments and houses have low energy efficiency rating and are heated exclusively with gas, this proportion is also quite high in smaller cities, while significantly lower in Budapest, county seats and cities with county rights (Figure 6). So ETS2 is expected to have a more significant impact in villages and smaller cities than in bigger cities and in Budapest, but still, the impact is not negligible in these categories either.

Another important aspect is the geographical location of these apartments and houses. From the 2022 census, we only got regional (NUTS2) level data about the energy rating and heating. Most houses and apartments with low energy rating and gas heating are located in the Dél-Alföld (Southern Great Plain), followed by Észak-Alföld (Northern Great Plain) and Észak-Magyarország (Northern Hungary). In the Southern Great Plain and the Northern Great Plain, most houses and apartments with low energy rating and gas heating are located in smaller towns (also in Pest county), while in other regions most of them are located in villages (Figure 7), but this is also connected to settlement structure (there are relatively fewer villages in the Great Plain). So, while nationally villages are expected to be most affected by ETS2, regionally smaller cities can be most impacted.

The share of houses and apartments with H-I energy efficiency rating and gas heating from the housing stock is the highest, more than 40%, in the Southern Great Plain, and it is almost 40% in Northern Hungary and the Northern Great Plain, while it is less than 20% in Budapest. Based on these data ETS2 is expected to impact the Southern Great Plain the most and Budapest and the major cities the least (however as the number of housing units is the highest in Budapest and the major cities, the lower rate of impact means a high impact in nominal terms as Figure 7 presents).

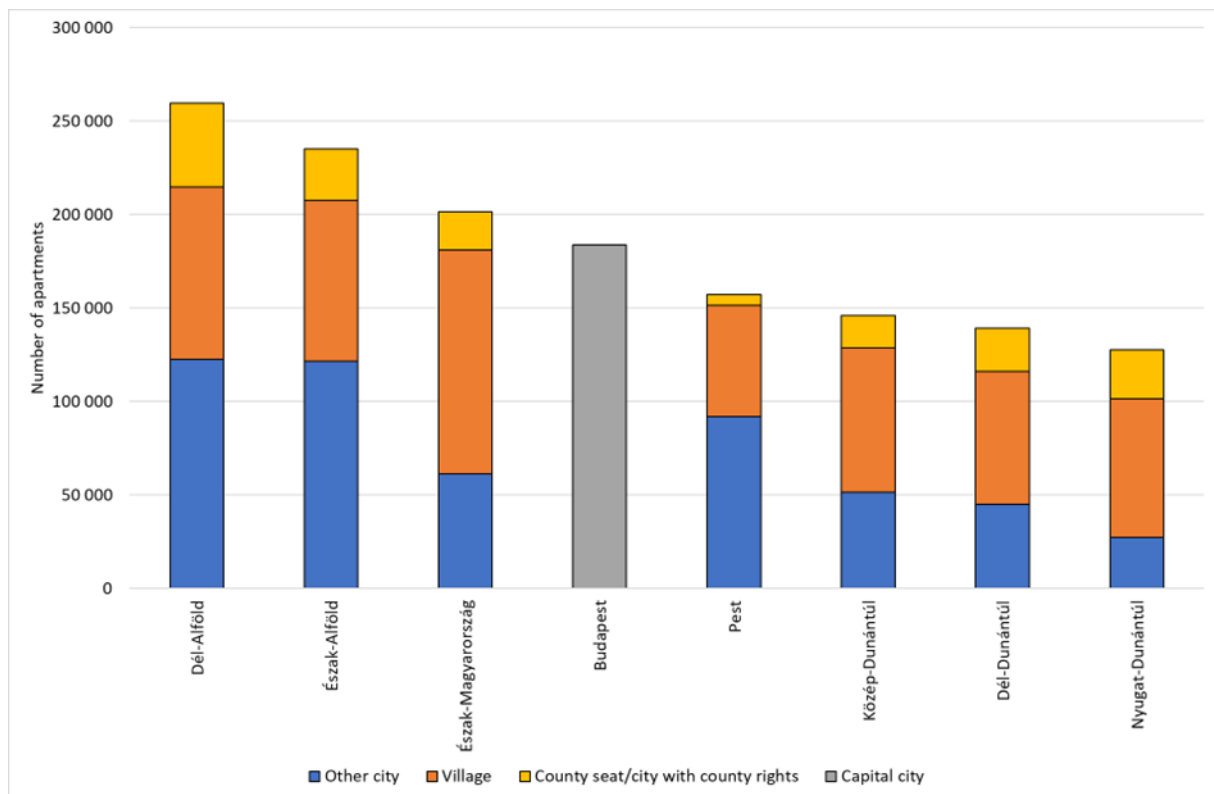


Figure 7. The number of houses and apartments with H-I energy efficiency rating and gas heating in NUTS2 regions in different settlement types. Data source: 2022 census based on the model by KSH and MEHI

In conclusion, ETS2 will probably affect households living in single-family houses more than households living in apartments, and the impacts will be larger in villages and smaller towns than in bigger towns and Budapest. Among the regions, the Southern Great Plain, Northern Hungary and Northern Great Plain will be the most impacted, while the impacts will probably be smaller in Transdanubia, Pest and especially in Budapest in proportional terms.

Indeed, when looking at statistics from the time the government increased the utility price cap, it was single family households across the board that were most likely to report a substantial increase in energy cost (Figure 8). In Budapest, less the construction time of the family house that was decisive, more the size of the building. That is why in Budapest family-houses constructed after 1981 were hit by the price increase the most, and most probably these buildings would be affected by ETS2 the most as well as a recent representative survey of the privately owned housing stock of Budapest presents.

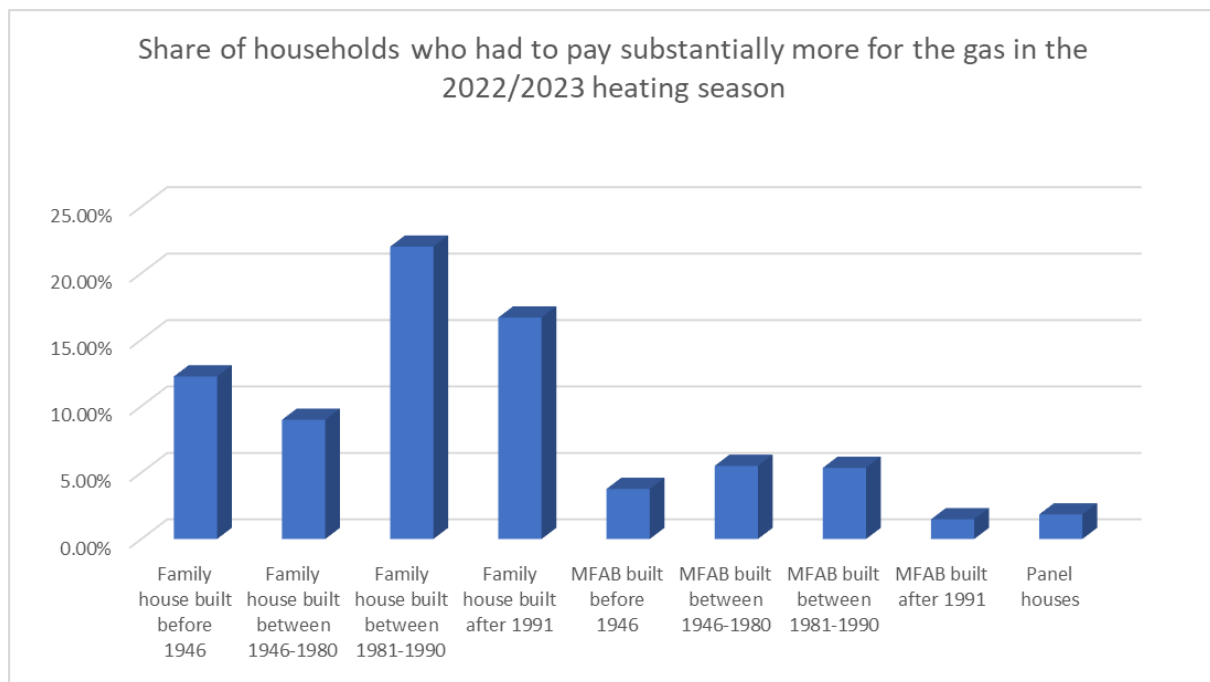


Figure 8. The share of households who had to pay substantially more for gas in the 2022/2023 heating season. Source: Socio-economic analysis of the residential building stock in Budapest (Budapest CARES project 2024)

Not only gas heated residential units may be affected by ETS2, but also a small share of those that are using district heating. The Hungarian district heating sector is also highly dependent on fossil fuels, mostly on natural gas, so it is also impacted by the ETS and ETS2. According to the most important data of the Hungarian district heating sector in 2024 (MEKH–MaTáSzSz, 2025), 68% of the heat was produced by natural gas in 2024, though its proportion is decreasing and share of renewable energy resources, mostly geothermal energy and biomass, is constantly increasing and is expected to further increase in the future.

The inclusion of district heating in the existing ETS is based on the thermal capacity of the given energy installation, if it is bigger than 20 MW, then the installation is already covered in the ETS. According to the latest data of MEKH and MaTáSzSz, there are 59 licensed district heating plants in Hungary whose thermal capacity is bigger than 20 MW, so they are included in the ETS1, this means that 94% of all thermal capacity of the Hungarian district heating system is in plants that have a bigger capacity than 20 MW. But only 52 of these 59 plants use fossil fuels, so probably only their GHG emissions are significant. These 52 plants account for more than 90% of the thermal capacity of all plants that use fossil fuels, and 50% of all thermal capacity. There are another 121 smaller plants, in 68 settlements, whose thermal capacity is below 20 MW, but only 104 of them use fossil fuels that are covered in the ETS2 (for example biomass is not covered in the ETS2), and the thermal capacity of these 104 plants altogether is only 5% of the whole thermal capacity of Hungarian district heating plants, so only 5% of all Hungarian district heating capacity could be impacted by the ETS2. **Based on the number of district heating units in Hungary (approx. 697,000), about 35,000 of them may be affected by ETS2 in the future, but these are the ones located in smaller towns of Hungary.** This amount is rather negligible compared to the ones using natural gas directly.

5 SCENARIOS FOR THE HUNGARIAN ADAPTATION

For Hungary, potential participation in ETS2 carries both cost and compensatory dimensions. While inclusion would expose residential energy consumption more directly to carbon pricing, it would also grant access to the ETS2 revenues, the Social Climate Fund, an EU-level instrument designed to support vulnerable households and finance energy transition measures. The interaction between carbon pricing, compensatory funding, and existing national tariff structures will therefore be a critical determinant of effective consumer price outcomes in the medium term.

We make the assumption that Hungary introduces the ETS2, as otherwise sooner or later it has to face an infringement procedure based on the Article 260 of the TFEU. (Which can cost up to 1 million EUR per day currently in the most serious cases.)

In case ETS2 is introduced in 2028 (or around) and the price of the allowance is safeguarded the Hungarian government still has a room of manoeuvre with regard to the ways and means of increasing the household gas prices and ways and means of mitigating the effects of the price increase.

5.1 Price impact scenarios

The introduction of the ETS2 into the residential buildings sector is strongly interconnected with the utility price reduction system, thus the scenarios for transferring the impacts of ETS2 are basically the following:

- Keeping the utility price cap/reduction and eliminating the whole ETS2 price impact as the government takes over the costs of ETS2 (“government pays all” scenario)
- Keeping the utility price cap and transferring the whole ETS2 price impact on the households (“ETS scenario”)
- Eliminating the utility price cap/reduction and transferring the ETS2 price impact on the households (“market” scenario)

Government pays all scenario

In this case the household price impact is zero, but the impact on the government budget is enormous.

The utility price cap already puts a huge financial burden on the government depending on the market price of gas (assuming that the natural gas coming from Russia is priced on market

level). According to estimates, in 2022 800 billion HUF, in 2023 2400 billion HUF, in 2024 1300 billion HUF and in 2025, 600 billion HUF was spent on financing the utility cap³⁸.

The financial balance of the state by entering the ETS2 system is based on two main factors:

- As the obligation of buying allowances in ETS2 is linked to the energy companies (primarily the gas and petrol providers) one of the major questions in this case is how much of this cost increase is compensated by the national government. As the extra cost cannot be transferred to the consumers, the cost sharing between companies and the state is a question of political negotiation. (On the other hand, gas and petrol companies are already struggling with the energy crisis and the obligatory phasing out of Russian fuel, so may not be cooperative in this regard.)
- As Hungary receives somewhat more funds from the ETS and Social Climate Fund than the amount of allowances bought by its companies (there is a positive discrimination on the system), the financial balance on government level may become positive. According to EU regulation 2023/955, Hungary will get the 4.33% of the SCF (significantly more than the country's share from the EU's population or emissions, because several social indicators were also taken into account, see in more detail in Chapter 3.3), which is approximately 2.82 billion €, this needs to be complemented with 25% national co-financing, which will make it 3.67 billion € (100-150 billion HUF annually). However, with the postponement of the start of the ETS2 from 2027 to 2028, the volume of the SCF will shrink to 54.6 billion €, and Hungary is expected to get only 2.37 billion € in this case, which would be 3.16 billion € with the national co-financing. The other 75 % of the ETS2 allowances to be auctioned by member states will be distributed between member states based on their GHG emissions from the covered sectors between 2016 and 2018. Since the start of the ETS2 was postponed, the cap is not yet determined, and the price of the allowances is not fixed (only in the first three years), it can only be estimated how much revenue Hungary will get from the auctioning of the allowances, but it may be 300-400 billion HUF annually - coming from the buildings and transport sector together.

This case the government keeps on financing the utility price cap (600-2000 billion HUF annually) and pays the price of allowances and the contribution to the SCF (400-500 billion HUF annually). On the other hand receives similar amount (400-500 billion HUF) to finance climate investments in the buildings and transportation sector.

³⁸ <https://telex.hu/gazdasag/2025/02/17/rezsivedelem-foldgaz-aram-tavho>
<https://telex.hu/belfold/2026/03/05/brent-ural>

ETS scenario

In case the current utility price caps remain, but the price impact of ETS2 is transferred to the households, **it would mean about 50% increase in the price of 1m³ gas** (compared to the protected price level, which is 102-109 HUF/1m³) according to the calculation of REKK. (REKK 2025). On 2024 prices the addition to 1m³ price is calculated to be 54 HUF - with VAT - in case the CO₂ price is the maximum protected price level of 45 EUR/tCO₂ (on 2020 price level). For a household that operates on the current utility price cap level (1729 m³/year) it would mean **about 94,000 HUF extra annually (7,800 HUF/month)**. Naturally, the average for a month may result in a much bigger amount in wintertime in case the consumption is measured every month. (The highest amount can be consumed in January up to 329 m³, which would mean a maximum extra cost of about 17,800 HUF that month, while in summer months the extra cost would not exceed 860 HUF/month.) On the other hand, for a household that lives in a classic “Kádár cube” and consumes appr. 3,500 m³/year, which means that pays 7 times more for 1m³ gas over the protected threshold already - thus currently pays about 1,5 million HUF/year - **this 94,000 HUF increase is nearly invisible (6%)**. (For economic operators that already pay - around 400-450 HUF/1m³) the increase would be about 13-14%.) Naturally, all these can be experienced in case the price of allowances is directly transferred to the households in 100%.

In case the utility price cap remains and ETS2 impact is transferred, the government has to take the financial burden of the cap system as it was emphasized in the previous scenario.

On the other hand, in case the cost of ETS2 is transferred to the households, the government may receive the benefits of it by receiving the amounts from the Social Climate Fund (see in the previous scenario) and the price of allowances bought in the auctioning process. Since the start of the ETS2 was postponed, the cap is not yet determined, and the price of the allowances is not fixed (only in the first three years), it can only be estimated how much revenue Hungary will get from the auctioning of the allowances. According to a study (REKK 2025), if the ETS2 would have already been in place in 2024, Hungary could have got approximately 115 billion HUF (310 million €) revenue in the building sector, and 213 billion HUF (580 million €) in the transport sector³⁹. Meanwhile this scenario anticipates a -0,3 price flexibility of the households (thus it assumes that the consumption of gas would reduce due to the higher prices, which is not the case in the previous scenario, where the income of the state may be higher).

On the other hand, the uncertainty in this scenario comes from the long-term price impact of ETS2. The ETS2 prices are protected in the first three years of the introduction (according to the current legislation). For the period afterwards there are rather different scenarios: the price increase can be skyrocketing up to 200 EUR/tCO₂ (which would mean the doubling of the current protected price level), but it is also possible that due to the structural interventions

³⁹ The study calculated based on the fact that member states will get 72.5% of auctioning revenues, however, according to the official EU sites, it will be 75%, so revenues might be slightly larger

the CO₂ emission in these sectors reduces as much that the demand for allowances decreases which keeps the prices moderate.

Market scenario

In this scenario the utility price cap should be phased out either gradually or sharply in line with the introduction of the ETS2.

This scenario requires the definition of a consistent baseline that approximates cost-reflective pricing. This is non-trivial in the Hungarian context, where administratively regulated tariffs significantly distort observed household price levels. As a result, current end-user prices do not provide a reliable reference for modelling market-driven outcomes or for comparison with broader European trends.

A more analytically robust approach is to derive a theoretical retail price level based on underlying market fundamentals. In liberalized European gas markets, household prices are typically composed of wholesale procurement costs supplemented by a layered structure of additional components: transmission and distribution network tariffs, storage and balancing costs, supplier margins, and various taxes or policy-related charges. The relationship between wholesale and retail prices is therefore systematic rather than arbitrary, and can thus be approximated using empirical EU-wide data. According to Eurostat and the European Commission, average household gas prices in the European Union in early 2025 were approximately €11.43 per 100 kWh, while wholesale prices during that time were in the range of €35–43/MWh. This implies a retail-to-wholesale multiplier of roughly 2.5–3x, a ratio that reflects the full cost structure of retail energy supply. The International Energy Agency has further noted that, despite the stabilization of wholesale markets following the 2022 energy crisis, this gap has persisted—and in some cases widened—due to structural cost components and delayed tariff adjustments.

Applying this EU-average pricing structure to Hungary suggests that, **in the absence of regulated tariffs, residential gas prices would likely fall within a range of approximately 400–500 HUF/m³ under current market conditions**. This estimate aligns with forward-looking wholesale price projections for 2025–2026 (roughly 197–276 HUF/m³), when adjusted for downstream system costs and fiscal components. It also implies a substantially narrower price band compared to the current Hungarian system, where consumers face either around 102 HUF/m³ (subsidized) or 747 HUF/m³ (above-threshold tariff). Data from the Hungarian Central Statistical Office, which report an average household gas price of approximately 147 HUF/m³ in 2024, further illustrate how aggregated figures can mask this internal duality and are therefore unsuitable as standalone reference points.

The regulatory uncertainty is compounded by broader geopolitical instability. The ongoing conflict involving Iran has already exerted upward pressure on global energy prices and introduced volatility across commodity markets. Such conditions complicate the policy environment in which ETS2 is to be introduced, potentially affecting both its timing and design.

Basing on the estimates about the market based gas prices described above the phasing out of the current utility price cap would increase the price of gas (1m³) by 400-500%. On the other hand, it is possible that the phasing out of the current system of the utility price caps would reward those households that currently have to pay over the protected consumption level (1,729 m³ gas/year), as the price level over the protected threshold is seven times higher than the protected level, and about one and half times more than the current market level. Thus, in extreme cases - e.g. in case of a typical “Kádár cube” - return to the market prices in practice means reduced cost of gas, and the impact of ETS2 would result in an about 13-14% additional price increase.

For a household consuming the amount of gas equalling the capped amount of 1,729 m³ annually the increase originating from the switch from protected to market prices may result in 350-500,000 HUF extra every year, thus the inclusion of the ETS2 (with an increase of 90-100,000 HUF) has a lower impact. **Comparing the impact of the introduction of ETS2 and the phasing out of the utility price cap system, we may conclude that the latter has a much bigger impact on the households.**

The current price capping system is socially unjust (as low consumption is not equal to social vulnerability, in many cases exactly the opposite) and does not provide proper behavioural incentives for reducing consumption. **The energy prices should always provide proper signals for consumption, and social compensation should be independent from general price setting.** The current price cap in Hungary should be phased out by lowering the capped threshold and introducing a multi-tier price system. In case the threshold is lowered, the price of 1 m³ gas should not be seven times more, as it would result in sharp cost increase for those who could not lower consumption immediately. A complex modelling is needed to set the proper thresholds and the different price tier levels.

5.2 Mitigation strategy

In case the national government decides to introduce ETS2, the revenues should be used to finance energy transition and mitigation of the social impacts of ETS2.

The mitigation strategy should have two major elements: 1) a renovation strategy and 2) a compensation strategy.

In order to mitigate the impact of energy prices increases (either due to the introduction of ETS2 or the phasing out of the utility price caps) the amount of energy used to heat/cool the apartments and houses must be reduced. **The question is where the focus of these interventions should be.** According to the Energy Performance of Buildings Directive 16% primary energy savings have to be achieved at the residential housing sector by 2030 and 20-22% by 2035. 55% of these savings should be achieved by the renovation of the 43% least efficient housing. According to energy modelling the most energy can be saved from the renovation of these worst performing buildings. Meanwhile it is important to know that these buildings (that correspond roughly to the H-I energy certificate categories in Hungary) are primarily found in family houses in rural areas. Villages account for a disproportionately large

share of these buildings: out of approximately 1.24 million village dwellings, nearly 970 thousand fall into the H-I category (78%). This indicates that low energy performance is particularly prevalent in rural settlement types, where the housing stock is older and renovation rates are typically lower. But these buildings take up nearly 20% of the multi-family housing units in Budapest and 38% of family houses in Budapest as well.

What is also essential to know that the worst physical condition does not necessarily go hand in hand with lower social status. This correlation is valid in villages and small towns, but not as much prevalent in big cities and Budapest.

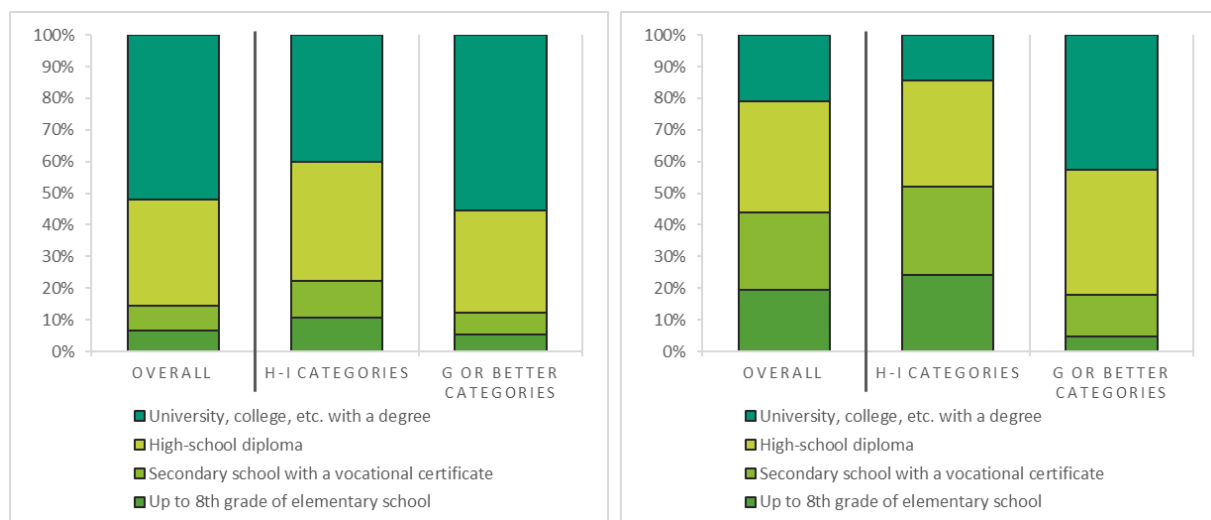


Figure 9. Highest level of education within households across energy performance categories, in Budapest – figure on the left – and villages – figure on the right. Data source: Census 2022 based on the model by KSH and MEHI

As the figure above presents, the social composition of households (measured by the highest educational level in the family) does not differ as much between the residents of H-I housing units and G or better housing units in Budapest, while it differs significantly in villages. This fact leads to significant consequences: **in Budapest and other major cities mainstream programmes supporting the renovation of housing units with a relatively modest subsidy level might be sufficient**, as there is a strong layer of residents living in these worst performing segments that may have the intellectual and financial capacity to implement the renovations. While in small towns and villages, where the worst performing buildings take up vast majority of the housing stock and the social composition of these buildings consist of much less educated people with lower level of social capital, subsidy alone may not be enough. As the experience of NGOs working with energy poor people in rural areas prove, **these people may need to get dedicated high intensity funding and strong personalised technical assistance in order to be able to benefit from the financial opportunities.**

The financial source of mainstream interventions may be the revenues from ETS2 and other European Funds (Recovery and Resilience Facility and European Structural and Investment Funds) that were hardly used in their full scale due to the ban on European transfers for Hungary (for not meeting the conditionality criteria). While the source for supporting special

social groups should be the Social Climate Fund. According to the original plans on RRF approximately 982 million € would be available for residential energy efficiency renovation and the installation of renewable energy resources. The available budget for the residential sector is 283 million € containing both grants and loans from ERDF according to the current plans (but it may have been used up to finance the Home Renovation Programme).

What seems to be visible is that **400-500 billion HUF (1,1-1,3 billion €) may be available annually to be devoted to supporting the renovation of residential units, focusing on the worst performing ones among them.** The amount of funds depends on several factors, such as carbon prices, the pace of reliving European funds, but also strongly on political preferences (like the division of funds between transportation and building related issues, between residential beneficiaries and other supported entities).

The amount described above would be sufficient to support the deep renovation of 40-60.000 housing units (the scale depends strongly on the subsidy intensity). This is still about half of the amount that should be completed in order to reach the 2030 and the following climate goals (e.g. 3% annual renovation rate). It means that the support from these funds should be efficiently targeted to motivate those that can afford renovation with a lower rate and concentrate extra support – mainly from the Social Climate Fund – for those who would not be able to benefit from the resources.

An additional consideration is that not only the amount of subsidies that matters but also timing. Implementing structural measures (setting up support schemes, selecting the beneficiaries, implementing the renovations) takes time. Based on the former experiences, it takes at least 1,5-2 years when the first results arrive. Even if we continue to finance subsidy schemes that already proved to be efficient after a long learning period (like the Home Renovation Programme), new schemes and extra efforts are needed to support the most needy and socially most deprived. **There is a danger that the impacts of ETS2 will come much sooner than the impacts of structural interventions may appear.** In order to avoid that **direct income support financed from the Social Climate Plan could be considered for those who are hit strongly by ETS2** – like low income families living in certain types of buildings (correlating to H-I levels), heated exclusively by natural gas. (There are several examples of that appear in the draft Social Climate Plans like in Poland, Slovenia, Bulgaria, Netherland, Italy, Greece) (We also provide some examples of income compensations from former Hungarian experiences and outside of the country in chapter 6.2.3)

6 ANNEX

6.1 The establishment and main characteristics of the EU ETS

The EU ETS Directive was adopted in 2003, and after that the ETS started to operate in 2005. The System operates in trading phases, Phase 1 lasted from 2005 to 2007, Phase 2 from 2008 to 2013, Phase 3 from 2013 to 2020, and it is currently in its 4th phase between 2021-2030.

Legislative framework

The legislative basis of the EU ETS is the ETS directive⁴⁰, which was adopted in 2003, and since then it has been amended several times to meet the EU climate targets.

For the fourth trading phase, the directive was revised first in 2018, in line with the EU's 2030 climate and energy framework, established in 2014. Later, the directive was also revised several times in 2023, because of the launch of the European Green Deal and more ambitious climate targets under the European Climate Law (EU Member States committed to becoming climate-neutral by 2050, the EU aims to reduce its net emissions by at least 55% by 2030, compared to 1990 levels). The reforms introduced in 2023 included the strengthening of the Market Stability Reserve, a reform concerning aviation, the inclusion of maritime transport, the establishment of the Social Climate Fund and ETS2⁴¹.

Gases and sectors covered

The ETS is mostly focused on CO₂, however since Phase 2, N₂O from the production of nitric, adipic and glyoxylic acids and glyoxal, and PFCs from the production of aluminium are also included. CO₂ emissions from electricity and heat generation, energy-intensive industry sectors, namely oil refineries, steel works, production of iron and aluminium, cement, lime, glass, ceramics, pulp, paper, cardboard, acids are included, also aviation since 2012, maritime transport since 2024.

Participation in the ETS is mandatory for companies in these sectors, however, in some sectors, only operators above a certain size are included, which may exclude some small installations, but in those cases the national governments need some other measures to cut their emissions.

Emission caps

The ETS is a cap-and-trade system, it sets a limit for the total amount of emissions, then issues tradable emission allowances (EUAs) not exceeding the cap. Then the cap is gradually reduced to meet the EU's GHG emission reduction targets, so the supply decreases. One allowance permits to emit one tonne of CO₂ equivalent. Installations covered by the ETS are obliged to hand over an equal amount of allowances to their emissions of the previous year, companies can buy and sell allowances, including those they received for free, so trade them with each

⁴⁰ (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02003L0087-20240301>)

⁴¹ (https://climate.ec.europa.eu/eu-action/carbon-markets/about-eu-ets_en#eu-ets-legislative-framework)

other (LIFE ETX, 2024). There are general allowances concerning most sectors covered in the ETS (electricity and heat generation, industrial manufacturing and maritime transport) and aviation allowances. The price of the allowances is determined by supply and demand at the EU carbon market.

Most of the allowances are now sold in auctions, but there are also free allowances. Actors covered in the ETS can also trade allowances between themselves on the secondary market, there are several trading platforms, where regulated entities or other actors, such as financial institutions can trade allowances⁴². The Union Registry⁴³ operated by the European Commission keeps track of the ownership of allowances held in electronic accounts, each regulated entity has to open an account. Operators must monitor and report their emissions annually, and surrender enough allowances to cover their emissions. If they emit more than what their allowances cover, they have to pay the penalty. The penalty is currently 100 EUR, and regulated entities have to pay it if they cannot cover their emissions during the preceding year, the payment of the penalty is not enough in itself, they also have to surrender the missing allowances the following calendar year (ETS Directive). For this, first of all, companies must track their GHG emissions throughout the year, and at the end of the year, their emissions report must be verified by an accredited independent verifier. Based on this report, the company has to make sure that it holds enough allowances on their official registry account, and before the deadline they must electronically transfer the corresponding number of allowances to the authority's retirement account, then the authority verifies if they really surrendered enough allowances⁴⁴.

Since 2013, there has been an EU-wide cap on emissions from power plants and industry installations (maritime transport is also included since 2024, when it was added to the ETS). This cap is reduced annually, based on a pre-determined linear reduction factor. This reduction factor is based on the reference cap value, which means the average total volume of allowances issued annually during 2008-2012 (Phase 2). Until 2020, the annual reduction factor was 1.74%, since 2021, it is 2.2%. After the 2023 revision of the ETS Directive the reduction factor has been increased to 4.3% per year over the period 2024-2027 and to 4.4% per year from 2028, to achieve emission reduction by 62% by 2030 compared to 2005 levels⁴⁵. When maritime transport was added to the ETS in 2024, the cap was increased by 78.4 million allowances (this meant altogether 1 386 051 745 allowances in 2024)⁴⁶. Within the cap, most allowances are auctioned, but some of them are allocated for free or reserved for EU funds.

⁴² <https://carbonmarketwatch.org/2024/02/29/faq-what-is-the-eu-emissions-trading-system-eu-ets/>

⁴³ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/union-registry_en

⁴⁴

[https://www.homaio.com/glossary/surrendering#:~:text=The%20surrendering%20of%20allowances%20is,Trading%20System%20\(EU%20ETS\).](https://www.homaio.com/glossary/surrendering#:~:text=The%20surrendering%20of%20allowances%20is,Trading%20System%20(EU%20ETS).)

⁴⁵ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/eu-ets-emissions-cap_en

⁴⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023D1575>

Aviation allowances are handled separately from general allowances. 82% of the aviation cap is allocated for free, 3% is reserved for new entrants and only 15% is auctioned, but this share will gradually increase, free allocations will be phased out from 2026. Since 2021, the aviation cap is also reduced annually with the same reduction factor as general allowances.

The phases of the EU ETS

The first trading phase was a three-year pilot between 2005-2007, characterized by 'learning by doing' to prepare for the next phase. This phase covered only CO₂ emissions from power generators and energy-intensive industries, including oil refineries, coke ovens, and iron and steel plants, as well as production of cement, glass, lime, bricks, ceramics, pulp, paper, and cardboard. Most of the allowances were given to businesses for free, and the penalty for non-compliance was €40 per tonne of CO₂ emitted. The first phase succeeded in establishing a price for carbon and creating the infrastructure needed for the operation of the ETS, including monitoring, reporting and verifying emissions. Since reliable historical emissions data were absent, the caps were determined by estimates, and finally the total amount of allowances issued exceeded emissions, so the supply was larger than the demand, which caused a significant decrease in prices, so Phase 1 allowances could not be transferred to Phase 2 (LIFE ETX, 2024).

Phase 2 (2008-2012) covered the same period as the first commitment period of the Kyoto Protocol. During this period, emission caps were set based on actual verified emissions data, and lower caps were set than in the first phase to reduce emissions. However, the 2008 economic crisis and the decline of economic production resulted in lower emissions than expected, so it led to a surplus of allowances and credits.

Free allocations still dominated the system, but their proportion was lower than during Phase 1, but still around 90%, on the other hand, several countries (Germany, United Kingdom, the Netherlands, Austria, Ireland, Hungary, Czechia, and Lithuania) organised auctions. The penalty for non-compliance was increased to €100 per tonne. Besides CO₂, nitrous oxide emissions from the production of nitric acid were included by some countries. The Union registry was created to replace national registries. Iceland, Liechtenstein and Norway joined the ETS during this phase. The aviation sector has been included in the ETS since 2012, with a cap calculated separately.

The ETS was reformed for Phase 3 (2013-2020) which changed the system significantly compared to the first two phases. A single EU-wide emission cap was introduced, instead of national caps. The cap was set at 2,084 MtCO₂ e in 2013, and was reduced annually by a linear factor of 1.74%, resulting in a cap of 1,816 MtCO₂ e in 2020 (ICAP, 2022). Auctioning became the default method for allocating allowances, instead of free allocations, approximately 57% of the allowances were auctioned. Free allocations still exist, mostly with the aim of preventing carbon-leakage. More sectors and gases were included, like carbon capture and storage installations, production of petrochemicals, ammonia, nonferrous and ferrous metals, gypsum, aluminum, as well as nitric, adipic, and glyoxylic acid. Another major change is that

power plants stopped receiving free allocations and had to pay the full carbon price for their pollution, except for the lower income member states under the Article 10c derogation.

Currently, the system is in its fourth phase (2021-2030). During this phase, also a linear reduction factor is applied annually to the overall cap, it is set at 2.2% per year for 2021-2023, 4.3% for 2024-2027 and 4.4% from 2028 (ICAP, 2022). During this phase, following Brexit, the United Kingdom is no longer part of the ETS, except for electricity generators in Northern Ireland. From 2024, maritime transport has also been included in the ETS. Auctioning is still the default method, around 57% of the allowances will be auctioned (ICAP, 2022). In the current phase, two investment funds, the Innovation Fund and the Modernisation Fund were also established. Since 2021, the use of international credits is no longer permitted (it was already limited in Phase 3), because it hampered the functioning of the EU ETS by inflating the oversupply of allowances (LIFE ETX, 2024).

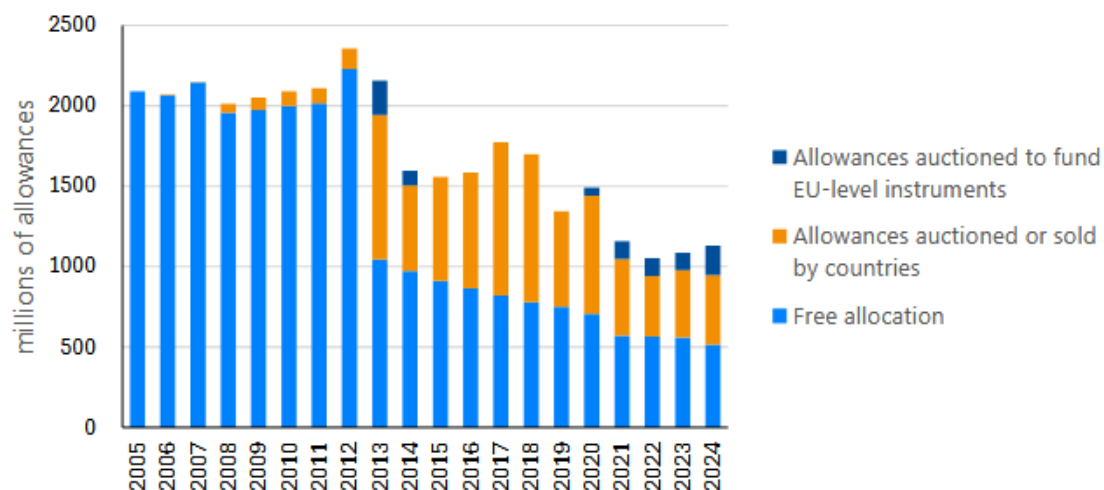


Figure 10: Allocation of the EU ETS allowances (2005-2024). Source: <https://www.eea.europa.eu/en/analysis/maps-and-charts/emissions-trading-viewer-1-dashboards>

Auctioning

During Phase 2, some countries already organised auctions, but auctioning became the default method for distributing allowances in Phase 3, so since 2013. Auctioning is regulated by the ETS Directive and the Auctioning Regulation⁴⁷. According to the ETS Directive, Member States are required to auction all the allowances that are not allocated for free or not placed in the Market Stability Reserve. Member States auction their allowances via the common auction platform, European Energy Exchange (EEX)⁴⁸, which is located in Leipzig. 25 EU Member States, 3 EEA EFTA States, the Innovation Fund, the Modernisation Fund, RRF and SCF use the Common Auction Platform 3 (CAP3), while Germany, Poland and Northern Ireland use separate auctioning platforms.

⁴⁷ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202302830

⁴⁸ <https://www.eex.com/en/>

Auctioning calendars are published at the end of each year for the upcoming year, and include the dates and volumes of general and aviation allowances to be auctioned per Member State, and also for the Innovation Fund, Modernisation Fund, Social Climate Fund and RRF⁴⁹.

During Phase 3, up to 57% of the general allowances were auctioned, the remaining allowances are allocated for free to prevent carbon leakage.

From the volume of allowances to be auctioned by member states, 90% is distributed among all Member States in auction shares based on historical emissions. 10% is distributed among 16 Member States (Bulgaria, Czechia, Estonia, Greece, Spain, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovenia and Slovakia) for the purpose of solidarity⁵⁰, so it is also called Solidarity Provision (ERCST & CEEP 2020).

About 15% of aviation allowances has been auctioned in Phase 3, but this proportion is gradually increased in Phase 4, and from 2026 full auctioning is planned, while free allocations will be phased out⁵¹.

Member States are required to use their auction revenues for climate- and energy-related purposes. Besides national budgets, auctioning also raises revenues for the Innovation Fund, the Modernisation Fund and starting in 2026, the Social Climate Fund (see in more detail in 3.9). In 2024, the EU ETS raised nearly €3 billion for the Innovation Fund and over €6 billion for the Modernisation Fund⁵².

⁴⁹ <https://www.eex.com/en/markets/environmental-markets/eu-ets-auctions>

⁵⁰ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/auctioning-allowances_en

⁵¹ https://climate.ec.europa.eu/eu-action/transport-decarbonisation/reducing-emissions-aviation_en

⁵² https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/auctioning-allowances_en

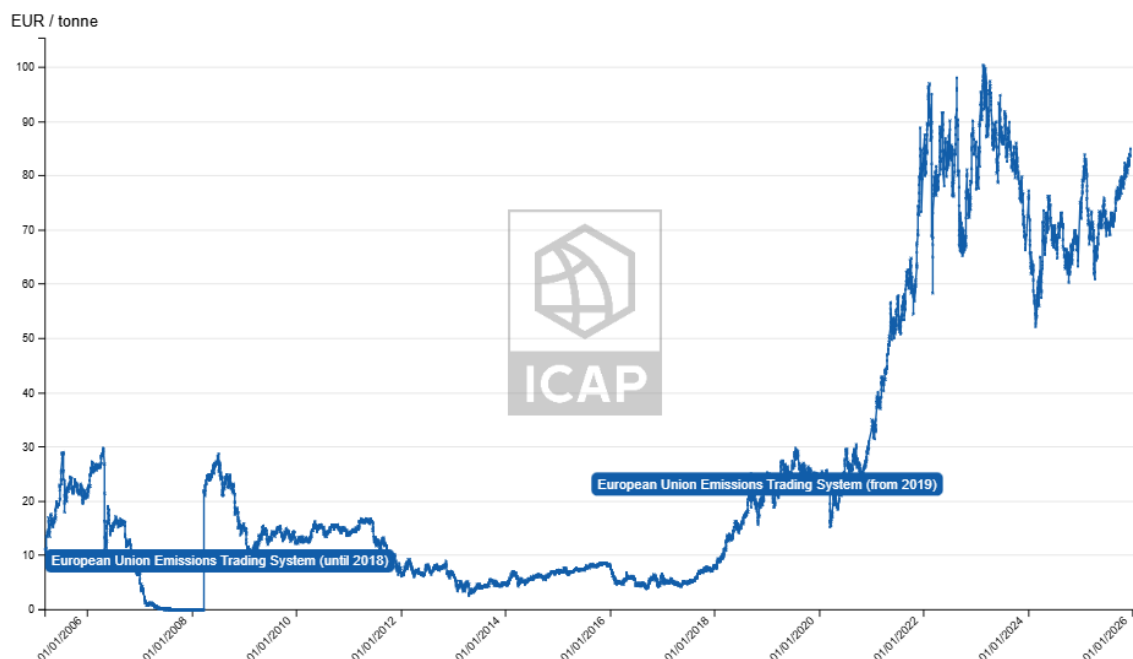


Figure 11: The price of an ETS allowance (2005-2026). Source: <https://icapcarbonaction.com/en/ets-prices>

Free allocations

Even though auctioning is the default method for distributing allowances since 2013, in a few sectors the transition to full auctioning takes place gradually, these sectors receive free allocations to avoid carbon leakage⁵³. Free allocations are primarily used in the manufacturing industry, power plants can also receive some free allowances for modernisation and decarbonisation (Article 10c Derogation). Member states calculate free allocation for the installations in their territory and submit it to the Commission for review who assesses it. Free allocation is based on performance benchmarks reflecting emission intensity, and benchmarks are also reduced by the Commission to encourage companies in each sector to decarbonise and advance innovation.⁵⁴

The aviation sector got most of its allowances for free since 2013, but is planned to be phased out by 2026.

Free allocations are calculated by the Member States for each installation in their territory and then the Commission assesses it, after that free allocations are given annually to the installations. Free allowances are also set aside for new and growing installations from

⁵³ List for Phase 4 available here: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0708&from=EN>

⁵⁴ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/free-allocation/about-free-allocation_en

allowances that were not allocated from the total amount available for free allocation in Phase 3, and also from the Market Stability Reserve⁵⁵.

Free allocation is often criticised, since it undermines the ‘polluter pays’ principle which is the basis of the ETS, and even allows some enabled businesses unearned profits, according to a study (LIFE ETX 2024; WWF 2022), enabled businesses extracted approximately EUR 50 billion unearned profits between 2008 to 2019 by selling the allowances they did not need. Approximately only 37% of industrial installations did not receive enough allowances for free during 2008-2019 to cover their actual emissions. Because of this, emissions in some industrial sectors remained stagnant or decreased very slowly. Emissions from aviation are still not decreasing, that is partially why the phasing out of free allowances was decided.

Free allocations for the heavy industry sectors covered by the Carbon Border Adjustment Mechanism (CBAM)⁵⁶ are also planned to be gradually phased out between 2026-2034, though a later phase out is being considered now⁵⁷. CBAM starts to operate in 2026, it is an alternative method to prevent carbon leakage, instead of giving free allocations it aims to align the carbon costs of foreign producers with those of EU producers, so it ensures that there is no competitive disadvantage for EU producers compared to non-EU producers that do not pay a carbon price at home⁵⁸.

Market Stability Reserve

The Market Stability Reserve (MSR)⁵⁹ was established in 2018 and began operating in 2019 to handle the surplus of allowances by balancing supply and demand. It was needed, because the 2008 economic crisis reduced emissions a lot more than expected, and therefore created a surplus of allowances. Later, the influx of international credits, which could be exchanged for allowances also created surplus. The surplus led to lower prices of allowances and, so a weaker incentive for installations and operators to reduce emissions. Part of the surplus of allowances was placed in the MSR. Because of the introduction of the MSR, the period of extremely low carbon prices ended in 2019.

The MSR works based on a predefined threshold of the “total number of allowances in circulation” (TNAC) every year, published by the European Commission which basically represents the oversupply:

⁵⁵ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/free-allocation/allocation-industrial-installations_en

⁵⁶ https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en

⁵⁷ <https://think.ing.com/articles/eu-carbon-price-slides-amid-policy-noise-and-fund-selling200226/>
<https://eurometal.net/germany-urges-eu-to-delay-phaseout-of-free-carbon-allowances-for-heavy-industry/>

⁵⁸ <https://www.oecd.org/en/blogs/2025/03/eu-carbon-border-adjustment-mechanism-what-is-it-how-does-it-work-and-what-are-the-effects.html>

<https://carbonmarketwatch.org/glossary/carbon-border-adjustment-mechanism-cbam/>

⁵⁹ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/market-stability-reserve_en

- When the TNAC exceeds 833 million, the MSR withdraws allowances from auctions, reducing supply in the EU carbon market. Allowances are withdrawn from auctions at a rate of 24% of the TNAC, over a 12-month period.
- When the TNAC falls below 400 million, the MSR releases 100 million allowances for auction, increasing supply in the EU carbon market.

Since 2023, allowances held in the MSR above a certain threshold are invalidated annually and are permanently removed from the system. From 2024 onward, the applicable threshold is fixed at 400 million allowances.

Spending the revenues

From 2013 (so the beginning of Phase 3) to late-2025, EU ETS auctions have raised over €245 billion in revenue⁶⁰. The ETS revenues mostly flow to national budgets, and Member States must use them to support investments in renewable energy, energy efficiency improvements and low-carbon technologies that help reduce emissions, and also for climate change adaptation and just transition initiatives. The only exception from this rule is the possibility for Member States to use ETS revenue to provide aid for electricity-intensive industries for indirect carbon costs⁶¹. More precisely, revenues can be spent on any activities aimed at reducing emissions⁶²; avoiding deforestation and helping the restoration of peatland, forests and other land-based ecosystems or marine-based ecosystems, reforestation; fostering renewables and related infrastructure like grids and storage; improving energy efficiency in industries and buildings regarding both heating and cooling; cleaner technologies for mobility, like electric vehicles, the improvement of rail transport and cycle paths, deploying sustainable alternative fuels; deploying carbon capture and storage and carbon removals; climate change adaptation; and protecting vulnerable households affected by increased costs of electricity, for example by reducing distortive taxes; and also research activities can be supported connected to the aforementioned topics (Directive 2003/87/EC). The reporting system also makes it possible to cover existing climate spending with ETS revenue.

Before 2023, they were required to use at least 50% of the revenues for these purposes (according to their reports they spent a higher percentage on these purposes), in Phase 3 member states had been investing less than three-quarters of EU ETS revenue in climate-

⁶⁰ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/how-do-member-states-use-ets-revenues_en

⁶¹ [https://climate.ec.europa.eu/eu-action/climate-strategies-targets/progress-climate-action/eu-climate-action-progress-report-2025/chapter-2-eu-emission-trading-system_en#:~:text=Member%20States%20directed%20most%20of,transport%20and%20mobility%20\(22%25\).](https://climate.ec.europa.eu/eu-action/climate-strategies-targets/progress-climate-action/eu-climate-action-progress-report-2025/chapter-2-eu-emission-trading-system_en#:~:text=Member%20States%20directed%20most%20of,transport%20and%20mobility%20(22%25).)

⁶² [https://carbonmarketwatch.org/2024/07/11/faq-eu-emissions-trading-system-revenues/#:~:text=Since%20the%202023%20reform%20came,some%20energy%2Dintensive%20producers\).](https://carbonmarketwatch.org/2024/07/11/faq-eu-emissions-trading-system-revenues/#:~:text=Since%20the%202023%20reform%20came,some%20energy%2Dintensive%20producers).)
<https://www.eea.europa.eu/en/analysis/indicators/use-of-auctioning-revenues-generated#:~:text=Emissions%20Trading%20System-,Billion%20EUR,heating%20and%20cooling%20in%20buildings>

related activities, with €25 billion not spent on climate action but general government spending, and even from the part reported to be spent on climate action, approximately €12 billion was spent on projects that were either not sensible in climate terms or that could have resulted in increased emissions, for example compensation for the ETS carbon price, modernisation of coal infrastructure, switching from coal to gas, fossil fuel-based heating systems, diesel cars or high carbon sources of bioenergy (WWF, 2022). From mid-2023, based on Directive (EU) 2023/959 amending Directive 2003/87/EC, member states are required to spend all their EU ETS revenues (or an equivalent amount) in support of the green transition, while also considering its social impacts, but the revenues do not need to be spent in the year of their generation⁶³. But even before 2023, Member States usually spent more than 50% of their revenues on climate action, during Phase 3, they spent approximately 75% of their revenues on this goal. Member States have to report annually about the spending of their ETS revenues, and the European Commission monitors whether the revenues are really spent for the required purposes.

Member States are also required to provide visibility to their projects financed by ETS revenues by sharing project details and results, good practices or display plaques, use promotional materials etc. They also have to display the EU label and the label '(co-)Funded by the European Union Emissions Trading System', in English and also in national language⁶⁴.

However, revenue spending is often criticized, because the reporting process is vague and not of very good quality, and countries often leave parts of the reporting template empty. Sometimes it even occurred that countries, including Hungary, sent part of their revenues to fund fossil fuel heating systems (LIFE ETX 2024; WWF 2022).

Besides national budgets, the ETS also raises revenues for the Modernisation Fund since 2013, the Innovation Fund since 2020, the RRF-REPowerEU since 2023 (see in more detail in Chapter 3.2) and also for the Social Climate Fund since 2025 (see in more detail in Chapter 3.3).

⁶³ <https://www.eea.europa.eu/en/analysis/indicators/use-of-auctioning-revenues-generated>

⁶⁴ https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/how-do-member-states-use-ets-revenues_en

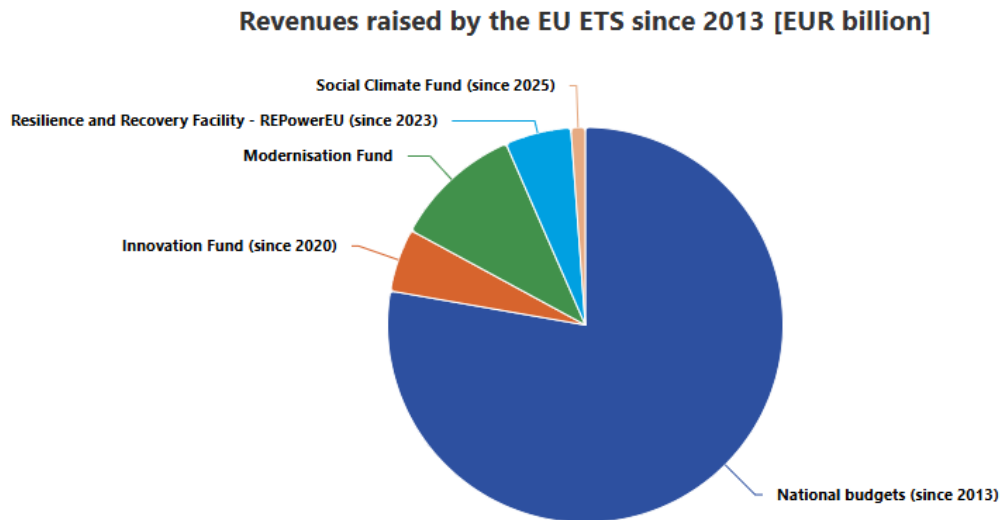


Figure 12: Revenues raised by the EU ETS since 2013 (EUR billion). Source: https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/how-do-member-states-use-ets-revenues_en

6.2 National adaptation strategies to combat the effects of ETS2 - the role of Social Climate Plans

The introduction of the ETS2 will increase energy prices, even if the extent of the price increase can only be estimated at this point and it depends on a lot of different factors in each country. Member states need to prepare for this price increase and elaborate different adaptation strategies and measures to mitigate the effects, especially among the most vulnerable groups who do not have their own means to carry out energy efficiency renovations or other adaptation measures. The Social Climate Fund was specifically designed to mitigate the impacts of the ETS2 and support vulnerable groups, and each member state has to prepare their own Social Climate Plan including the detailed measures they plan. However, the measures included in the SCPs are not the only adaptation strategies that can support vulnerable groups against the effect of a price increase, member states can naturally use other funds, like the revenues from the auctioning of allowances that go to the national budgets, or other EU or national funds to support their residents and enterprises in different ways. In this chapter (and also in the whole study) we mostly focus on the building sector, and not on the road transport sector.

In this chapter, we prepared an overview about the adaptation measures planned in those SCPs that were already submitted (plus the Croatian one from which the public consultation version was available) to collect some potential ideas for the future Hungarian Plan, if it will be prepared. From each analysed plan, we collected the different definitions of energy poverty and vulnerable households, and the designation of those groups that will truly be eligible for funding from the SCF. We also reviewed the planned measures in the building sector, and the frameworks of the temporary direct income support in those countries that plan with it.

The Swedish SCP was the first (and so far, the only) plan to be adopted, but it focuses exclusively on the road transport sector and not on the transport sector, so it is less useful for the purposes of this study. However, we also reviewed the Swedish SCP (Annex), because the definition of vulnerable groups and the support mechanisms might still be useful in the Hungarian context. In the Annex, we also collected some other international and Hungarian examples of consumer compensation from the transport and building sectors which might also be useful in the context of the ETS2 and the SCF.

By the time of the writing of this report, only five EU member states: Latvia, Lithuania, the Netherlands, Malta and Sweden submitted their Social Climate Plans, from which only the Swedish plan was adopted in December 2025, the others are currently under assessment by the Commission, but the draft versions are available online in the original language⁶⁵. The Croatian SCP has not yet been submitted, but its public consultation version is available, we also analysed it to have some ideas about the planned measures of a neighbouring country, even though it is probably not exactly the version that will be submitted to the EU and also the measures might change. It varies from country to country as to whether they plan to allocate more resources to the building sector or to the transport sector, there can also be big differences, for example the Swedish Plan focuses on transport, while the Dutch Plan focuses on building, and the other on both. Most countries only plan with structural investments and not with direct income support.

The Latvian SCP addresses both the building and transport sector. According to the Plan, 61% of support will go to the building sector, 36% to the transport sector, and the remaining to technical assistance, no temporary direct income support is planned.

The SCP of the Netherlands focuses mainly on the building sector, and it targets primarily the vulnerable households and micro-enterprises that have no or insufficient resources to take the step towards sustainability and therefore remain dependent on fossil fuels. The Plan does not specifically target the transport sector or the transport-poor target group, because they assume that there is a significant overlap between households experiencing energy poverty and those experiencing transport poverty, so transport poverty will be indirectly addressed through energy poverty. Moreover, there are other initiatives outside of the SCP, that pay considerable attention to reducing transport poverty. The Plan delegates 62% of the funds to the building sector, 35% to direct income support and 2,5% to technical assistance.

Malta SCP has a budget of approximately €60.5 million, 64% of it is planned to go to the building sector and 34% of it will go to the transport sector, and the remaining to technical assistance.

⁶⁵ The Latvian Social Climate Plan is available from here: <https://www.vestnesis.lv/op/2025/128.1>

The Dutch Social Climate Plan is available from here:

<https://www.rijksoverheid.nl/documenten/rapporten/2026/02/06/het-sociaal-klimaatplan-zoals-ingediend-bij-de-europese-commissie>

The public consultation version of Malta's SCP is available from here:

<https://www.gov.mt/en/publicconsultation/Pages/2025/NL-0020-2025.aspx>

The Croatian SCP plans to allocate 39% of the funds to the buildings sector, 57% to the transport sector and 2.5% to technical assistance, direct income support is not planned.

6.2.1 Defining the affected groups: the energy poor and vulnerable households

Essential to mitigating the effects of ETS2 is defining appropriately those, who will be hit the hardest. Thus, creating a measurable indicator to target energy poor and vulnerable households has been part of the development process of the Social Climate Plans, all member states are required to define energy poor and vulnerable households in their territory. It seems that it is rather difficult to define and determine the exact number of such households. All countries had slightly different definitions for energy poverty, but they are usually similar to the EU definition, it usually means households that are not able to access basic energy services due to lower-income levels, high energy prices or the insufficient condition of their home, or those who have access but, they must spend a high proportion of their disposable income on energy, so it basically means the lack of access to affordable energy. In each countries' definition, energy poverty is linked to some income indicator.

In the context of the SCPs, vulnerable households are those that will be impacted by the rising energy prices due to the introduction of ETS2, so usually households that are dependent on fossil fuels. Most plans link vulnerability to energy poverty, and vulnerable households are defined as that part of energy poor households that will become energy poor due to the ETS2. However, in some plans, vulnerability is only linked to an income level. SCPs usually can only estimate the number of vulnerable households, since there are still a lot of uncertainties around the ETS2, vulnerability is usually defined in less detail than energy poverty. Most Plans estimate that energy poverty will only increase slightly after the introduction of ETS2.

Latvia

In Latvia, energy poverty is defined in the Energy Law, it means the inability of a household to access basic energy services, where such services ensure basic levels and an adequate standard of living and health, including adequate heating, hot water, cooling, lighting and energy to operate appliances, within the relevant national context, in accordance with existing national social policies and other relevant national policies, resulting from a combination of factors, including at least the inability to afford prices, insufficient disposable income, high energy costs and poor energy efficiency. The Latvian SCP defines energy poverty by using the Energy Cost Compensation Information System (EIKIS), which is an information technology tool created in Latvia for the automatic calculation of household income per household member. According to the Law on State Support for Energy Supply Costs, EIKIS was primarily created to ensure the allocation of automatic support to households during periods when high energy prices are identified, but the Ministry of Climate and Energy has identified the possibility of using the algorithm included in EIKIS also to identify the proportion of households at risk of energy poverty. In practice and in the algorithm included in EIKIS, households at risk of energy poverty are understood to be households whose monthly housing expenses per household member are at least 30% of the monthly income per household member, according to this 38.31% of households are at risk of energy poverty in Latvia.

The definition of vulnerable households means households affected by energy poverty or households significantly affected by the ETS 2. The number of vulnerable households is estimated to increase by 3000 due the impacts of the ETS 2, so by approximately 1% of the number of households at risk of energy poverty before the implementation of ETS2. Accordingly, when applying the definition of vulnerable households, the indicator of the definition of energy poverty, namely the EIKIS system, is applied in the SCP.

Netherlands

There are various definitions for energy poverty in the Netherlands, the most used is probably the definition of Statistics Netherlands, according to which energy poverty is the lack of access to (affordable) energy supplies in the home. It concerns households that, due to their financial situation and the poor condition of their home, are unable to maintain a healthy indoor climate. It may also refer to households that are unable (financially) to keep pace with the energy transition. To determine this, four basic indicators are used:

- Households with a High Energy Ratio (HEQ): households that spend a relatively large proportion of their income on energy costs;
- Households with Low Income & High Energy Costs: households with limited financial resources and high energy bills;
- Low-Income Households & Low-Energy-Quality Homes: low-income households living in poorly insulated or energy-inefficient homes;
- Low Energy Quality Homes & Households with Limited Investment Capacity: households living in homes with poor energy performance and insufficient resources to invest in them.

For the measures within the SCF the same definition and indicators are used, but not on a one-to-one basis for practical and substantive reasons.

According to the Dutch SCP, the number of households in energy poverty is 420,319. The Plan estimates that the effects of ETS2 will impact 24,000 additional households experiencing energy poverty by 2030, compared to a baseline scenario without ETS2.

Within the SCP, different criteria are given for the different funds that will support the energy poor population. The Energy Fund is applied to provide direct income support, households with an income of up to 130% of the social minimum and an energy bill exceeding 8% of household income can have access to the fund. The National Heat Fund (Warmtefonds) will support energy-saving measures, it will provide loans for homeowners with no borrowing capacity. The 'Energy Homes' one-stop-shops that provide support to vulnerable households will focus on households with an income of up to 200% of the low-income threshold, who have high energy costs or live in a home with low energy efficiency.

Vulnerable households are not defined in such detail as energy poverty, it means households that have no or insufficient resources to take the step towards sustainability and therefore remain dependent on fossil fuels.

For the SCP, the number of vulnerable households (and also vulnerable transport users) is calculated by taking the households with an income of up to 130% of the social minimum, which is 1,158,000. And the number of households in energy poverty is 420,319 based on the Statistics Netherlands' indicators.

Malta

The Maltese SCP considers those households to be vulnerable where the residents are at-risk-of-poverty, so their income is less than the 60% of the median national equivalised income, this means 43,301 households in Malta. Energy poverty is not defined.

Croatia

The Croatian Ministry of Economy and Energy has adopted the definition of energy poverty by the Energy Efficiency Act, and it is also the basis of the definition of energy poverty within the framework of the SCP. Energy poverty is defined as a household does not have access to basic energy services, whereby such services ensure basic levels and a decent standard of living and health, including adequate heating, hot water, cooling, lighting and energy for powering household appliances, in the relevant national context, existing national social policies and other relevant national policies, which is caused by a combination of factors, including at least affordability, insufficient disposable income, high energy expenditures, poor energy performance of buildings and poor energy efficiency of homes. 10-15% of households are estimated to be energy poor in Croatia.

Vulnerable households mean energy poor households or households, including those on low and lower-middle incomes, which are significantly affected by the price impacts of including greenhouse gas emissions from buildings within the scope of the ETS2 and which lack the means to renovate the building in which they live.

According to the SCP energy poverty and vulnerability will only increase moderately with the introduction of the ETS2, because the majority of individuals and households considered to be vulnerable to energy poverty and particularly vulnerable to the introduction of ETS2 were already so before the introduction of ETS2.

In the framework of the SCP different definitions apply for eligibility criteria. For example, households with a total equivalent disposable income of less than 70% of the median equivalent disposable income of the country will be eligible for the energy renovation of family homes. This also includes some middle-class households that are above the formal poverty threshold (60% of the median), but are still highly vulnerable to energy poverty. The threshold is applied in combination with technical criteria (energy rating, damp/mould) to ensure fair and effective targeting of vulnerable groups. Eligible applicants are owners of family houses

with energy class D or lower for continental Croatia and energy rating C or lower for coastal Croatia.

For the investment targeting social and affordable housing, those households will be eligible whose monthly housing costs per household member amount to at least 30% of the monthly income per household member. The scoring criteria will include a weighting for applicants who use fossil fuels for heating, thereby targeting vulnerable households that are particularly affected by the introduction of ETS2.

6.2.2 *Structural interventions and direct income contributions*

SCPs can plan with structural investments and measures in the building and road transport sector, but maximum 37.5% of the countries' share from the fund can be given to vulnerable groups as temporary direct income support, but it needs to be phased out altogether by 2032.

Structural interventions are necessary to support the lowering of energy consumption in a sustainable way, therefore helping households and micro-enterprises to lower their energy costs as an adaptation method to the effects of ETS2, and also reducing GHG emissions. Structural investments can be planned for the building and road transport sector, and most countries usually plan measures for both sectors. Structural investments in the building sector usually include energy efficiency renovations, like different types of insulation and the replacement of windows and doors, and the use of renewable energy sources, for example the installation of heat-pumps, or connection to the district heating system. The measures usually target both single-family houses and multi-family apartment buildings with lower energy efficiency classes, sometimes also municipal buildings. Measures also include providing support with the renovation process, for example in the form of one-stop-shops.

Latvia

The Latvian SCP proposes the following measures in the building sector: the renovation of multi-apartment residential buildings; renovation of private houses; implementation of small-scale energy efficiency measures; energy efficiency measures in buildings that provide social functions of municipalities; use of renewable energy resources.

These measures are grouped into three 3 investment areas: The first one aims to increase energy efficiency and the use of renewable energy resources in multi-apartment residential buildings. It targets households in apartment buildings with energy efficiency class F, households that comply with the national energy resource cost compensation information system (EIKIS) developed by the national government and households exposed to the impact of ETS2, and they also plan to provide one-stop shop functions to help these households.

The second investment area supports vulnerable households for the implementation of small-scale energy efficiency measures and renovation of private houses. Within this they plan to provide support for the preparation of the necessary technical documentation by using and adapting the good practices of the support programs implemented so far. This area will also support energy efficiency improvement measures for vulnerable households living in private

houses, like window replacement, roof insulation, internal wall insulation, facade, attic, basement insulation, as well as the replacement of fossil fuel heating equipment and solid biomass heating systems with emission-free, renewable energy solutions or connection to district heating systems, if technically and financially feasible.

The third investment area also supports energy efficiency measures, but in the case of buildings that provide social functions of municipalities, which also include social housing.

Netherlands

The Plan will support households facing energy poverty to implement energy-saving measures by offering them insight, help and advice via one-stop-shop, and also by providing them with financial support, specifically for the group that needs it most because ETS2 is putting greater pressure on their financial situation.

Within the building sector, the Dutch SCP allocates €425.25 million to vulnerable households in energy poverty through the following measures: attractive and responsible financing via the National Heat Fund (Warmtefonds) for the implementation of energy-saving measures; advice, assistance and support for households via one-stop shop) ('Energy Houses'); the creation of so-called 'fix teams' to support the sustainability of micro enterprises, and there is also a measure linked to direct income support through the Energy Fund.

The financial support will be provided through the National Heat Fund (Nationaal Warmtefonds). This is not a new fund, it is a non-profit foundation and was co-founded by the central government (about 20% came from the government and the rest from private parties), and it has already operated since 2013. It was originally used mainly by high-income homeowners, but since 2022, interest-free loans and interest rate reductions were also offered to low- and middle-income homeowners, made possible by additional government funding. However, the current government has not set aside funds to continue this, so it can be continued from the SCF. Within the framework of the SCP, the fund can provide 'combination loans' to homeowners with no borrowing capacity and loans to homeowners' associations where low-income flat owners face rising contributions to the homeowners' association due to the building's sustainability improvements. Homeowners and Homeowners' Associations can borrow from the National Heat Fund to finance energy-saving measures, such as new window frames with low-emissivity glass, façade insulation, solar panels, and heat pumps.

The 'Energy Houses' houses measure will encourage municipalities to set up one-stop-shops, called 'Energy Houses' to support vulnerable households with energy-saving measures. 'Energy Houses' activities will include providing energy advice, practical and technical assistance, support with applying for grants or installing small-scale measures. The majority of funds dedicated to this measure will go directly to local authorities as grants, municipalities will have the coordinating role, but implementation will also require cooperation with private parties.

The Netherlands decided to phase out poor energy labels (E-F-G) in rental properties by 2029. However, there is no funding delegated to this measure within the SCP (listed in the plan as an ‘accompanying’ policy or a ‘zero-cost measure’), it will be a legal obligation to improve the position of tenants at risk of energy poverty. Private landlords have until 1 January 2029 to bring rental properties with E-F-G labels up to standard, if they fail to do so, the local authority may enforce compliance.

Regarding the support of vulnerable micro-enterprises, the Plan envisages the establishment of so-called ‘fix teams’ consisting of handymen and an energy advisor, which will implement simple energy-saving measures on site, such as insulation, door closers, LED lighting, and/or better calibration of existing installations, and also give advice to micro-entrepreneurs on additional saving options, such as equipment with lower energy consumption or the electrification of fossil-fuel-powered equipment, and inform them about possible subsidy and financing schemes. It will be the responsibility of local authorities to set up the fix teams, and also to select vulnerable micro-enterprises within their territory for which some criteria is listed in the SCP.

The direct income support is optional, the Swedish, Latvian, Croatian and Maltese SCPs do not foresee direct income support to citizens. The Swedish SCP states that direct income support would probably only have a marginal effect, while the electric car premium is expected to really contribute to climate neutrality. On the contrary, the Dutch SCP plans to delegate 35% of the funds to direct income support to help vulnerable groups to pay their energy bills. For this, €249.75 million is being allocated to a public Energy Fund. For direct income support, cooperation will be needed with local authorities who can help with approaching the target groups. The aim of direct income support is to alleviate energy poverty for vulnerable households in the short term, until sufficient measures (like home insulation, switching to more sustainable energy sources etc.) are implemented.

Malta

Within the component of the building sector, investments aim to support vulnerable households residing in social housing owned by the Government. This includes enhancing the energy efficiency in Social Housing Estates by installing heat pump water heaters; retrofitting public social housing units to possibly achieve zero-energy status; and enhancing the electricity distribution network through investments in the grid.

Croatia

The Croatian SCP also plans several measures and investments in the building sector to address energy poverty. The Plan will support the establishment of energy communities with the creation of pilot energy communities including households and micro-enterprises. Another measure will carry out renovations targeting energy efficiency in family houses for households at risk of energy poverty, reaching 5000 houses, with 100% co-financing for the most vulnerable, and 80% co-financing for other vulnerable groups, this measure will support household with an Equivalent Disposable Income which is less than the 70% of the median,

and who live in houses with D or C energy class. Energy efficiency renovation can mean thermal insulation, upgrading the building's technical systems or replacing them with more energy-efficient solutions, and also the introduction of renewable energy systems. The Plan also focuses on the mitigation of energy poverty in assisted areas and areas of special state concern (designated municipalities) where residents are unable to contribute financially to the energy renovation. This measure will target households living in buildings in very poor condition, for example buildings that have asbestos roofs, moisture and mold problems and safety risks. The energy-efficient housing stock for social and affordable housing is also planned to be expanded through renovation, adaptation and construction of energy-efficient buildings for social and affordable housing in brownfield areas, and the construction of new energy-efficient apartments if possible.

6.2.3 National examples for consumer compensation

Besides the planned structural investments from the different SCPs, we also reviewed the Swedish SCP, even though it only focuses on the road transport sector and not on buildings. The plan is interesting partially because it is the only SCP that has been adopted so far, and the definition of vulnerable groups and groups that are eligible for support from the SCF might also be interesting in the Hungarian context. And even though this study does not focus on electric cars, they are getting more and more wide-spread, even in Hungary, and their connection to the introduction of ETS2, and in general to climate action, is important.

We also collected some other examples of consumer compensation in the transport and building sectors, which might serve as useful inputs when planning how to support citizens whose energy cost increases with the introduction of the ETS2.

The Social Climate Plan of Sweden

The Swedish SCP focuses on transport and not on the building sector, and it will support citizens who are most affected by rising transport costs and struggle to access clean sustainable transport. The reason for this is that the transport sector is the largest emitting sector in Sweden, and road transport emissions account for almost 90% of total transport GHG emissions. On the contrary, the Swedish building sector is almost fully decarbonised and only very few households will be affected by ETS2, moreover, several active policies are already in place to address the impact of high heating costs, for example housing allowances are available for families with children and young people with high housing costs and low incomes, most apartments in multi-apartment buildings have the heat included in the rent, so change in heating costs do not directly burden tenants. Since 2016, Climate Leap is an investment aid that can be used by landlords and housing associations to replace fossil fuel heating systems. So altogether, Sweden assessed that measures in the transport sector are more justified than in the building sector. The plan will mobilise €532.8 million (97.5% of it to the electric car premium, 2.5% to technical assistance) to offer citizens more affordable access to electric cars, it will support around 115,500 households with payments of up to 1,300 SEK (around €120) per month for a maximum of 3 years to buy or lease new or used electric cars. The Plan focuses only on individual transport, because Sweden already has a well-developed public transport

system that solves many people's everyday travel needs, including a large proportion of vulnerable transport users, and most of it is financed by the state, regions and municipalities, and the financing needs are a lot higher than Sweden's share from the SCF, and an increased support for the public transport is expected to have only a marginal effect. Moreover, 95 % of public transport by bus is driven on renewable fuels or electricity, and Sweden already has a support scheme for electric buses.

The Plan does not envisage either direct income support, or the support of vulnerable micro-enterprises.

The definition of vulnerable groups

The Swedish SCP mostly focuses on vulnerable transport users and transport poverty and not on energy poverty, since it only targets the transport sector, however vulnerable households and households in energy poverty still appear in the Plan, though it is the official European and national definition, not a definition specifically within the SCP, since it is not relevant given that there are no measures about it. In the context of the SCP, energy poor households are defined as those with low economic standards combined with high energy costs. It is highlighted that both energy poverty and vulnerability to the effects of the ETS2 are very difficult to define in the case of multi-apartment buildings, because there are no available statistics and heating and hot water are usually included in the rent for tenants, so it is not easy to separate energy costs from the rent. Energy poverty was analysed for the recast of the EU's Energy Efficiency Directive (EU). According to this, energy poor households are single-family households with low financial standards and energy costs as a share of disposable income higher than 75 % of households living in single-family houses. Vulnerable households are households in single-family houses that are either energy poor or have an economic standard lower than the 80 % of the average economic standard of the population, combined with high energy cost. The number of vulnerable households is estimated to be around 129,000, and the number of households in energy poverty is 120,000, while the number of vulnerable transport users and the number of households in transport poverty are a lot higher: 740,000 and 330,000. If vulnerability is examined in the context of the ETS 2, the number of households affected by ETS 2 in the sense that their dwellings are heated by oil or gas is around 15 000 households in the lower middle-income group.

The SCP will benefit low and lower-middle income households residing in rural areas with limited public transport, it does not focus on micro-enterprises. Transport poverty is defined by households with low economic standards who either live in a rural municipality with limited access to public transport, or is a single person with children or the household includes one or more members with disabilities that pose significant difficulties in moving, the number of households in transport poverty is estimated to be around 330 000. In Sweden, the households eligible for the electric car premium will be households with an income less than the 80% of Swedish average income, where no one in the household is charged to state income tax, located in a rural municipality or in another area with limited access to public transport, households that do not already have an electric car or a plug-in hybrid.

Other examples for consumer compensation

Canadian Federal Fuel Charge

Besides dedicated funds, there are also other examples that aim to reduce emissions and compensate those who are affected by increasing prices, a frequently used tool is carbon tax.

A good example for the compensation of the residents is the Canadian consumer carbon tax, called Federal Fuel Charge, which was introduced in 2019⁶⁶ under the Greenhouse Gas Pollution Pricing Act⁶⁷, but it was terminated in April 2025. The tax was applied in 8 provinces and 2 territories (Alberta, Saskatchewan, Manitoba, Ontario, Newfoundland and Labrador, Nova Scotia, New Brunswick, Prince Edward Island and Nunavut, Yukon) where the carbon pricing system did not exist before or did not meet federal requirements.

The carbon tax is paid after petrol, diesel, natural gas, coal, kerosene, based on how much CO₂ their use emits, and the revenues were distributed equally among the population of the provinces as quarterly Climate Action Incentive (CAI) payments⁶⁸. It would be possible (and in some other provinces it is the case) not to reallocate the revenues to the citizens, but reallocation is a lot more easier regarding social responses, taxes are usually criticized or protested, so with reallocation altogether a larger tax can be imposed, which leads to bigger emission reduction⁶⁹. The reallocation of this tax was beneficial for approximately 80% of the population, who got more money than they paid, since fuel consumption was so uneven that only 20% of the consumers consumed more than the average, so they paid for the additional costs.

Beside the consumer carbon tax, Canada had, and still has an industrial carbon pricing system, which targets high-emission industrial and energy companies, this can also work slightly different in each province⁷⁰.

After the latest elections, Mark Carney stopped the federal consumer carbon tax in April 2025⁷¹. The reasons for the elimination of the consumer carbon tax were the concerns about the high cost of living due to the high inflation, concern for the US tariffs on Canadian products, which led to constant political debates about the tax and attacks from the Conservatives⁷².

⁶⁶ <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2018/oct/26/canada-passed-a-carbon-tax-that-will-give-most-canadians-more-money>

⁶⁷ <https://www.canlii.org/en/ca/laws/stat/sc-2018-c-12-s-186/139160/sc-2018-c-12-s-186.html>

⁶⁸ <https://www.canada.ca/en/departement-finance/news/2022/11/climate-action-incentive-payment-amounts-for-2023-24.html>

⁶⁹

https://levegomunkacsoport.blog.hu/2024/04/02/az_agyonhallgatott_modszer_ami_a_leginkabb_csokkenthet_ne_a_szen-dioxid-kibocsatast

⁷⁰ <https://climateinstitute.ca/explainer-differences-industrial-consumer-carbon-pricing/>

⁷¹ <https://www.canada.ca/en/departement-finance/news/2025/03/removing-the-consumer-carbon-price-effective-april-1-2025.html>

⁷² <https://www.cbc.ca/news/politics/mark-carney-drops-carbon-tax-1.7484290#:~:text=Carney%20had%20previously%20supported%20a,after%20Carney%20kills%20it%20federally>

The new political leadership decided to focus on taxing the large industrial emitters, instead of the consumers, so the industrial carbon tax remained in place.

Hungarian gas price compensation

Before the current 'utility cost reduction' programme which started in 2013 and is still in place, there was a residential gas price compensation system in place in Hungary. The system started in 2003 and aimed to reduce household utility costs. Consumers directly paid less to the supplier, the subsidy amount was already deducted from the bill, and the government reimbursed this difference later to the suppliers, so the state spent a substantial amount of money on this compensation, which was not sustainable in the long-term and negatively impacted consumer behaviour, especially during its first phase.

The system had two main phases: before 2007 almost every household was entitled to the compensation, but different categories were created based on the amount of consumption, which slightly determined the amount of compensation, but the social and economic situation of the consumers was not considered, there was also an upper limit, above which there was no compensation available (Energiaklub, 2009). Before 2007, households paid approximately half of the real market prices, as a result, three-quarters of Hungarians heated their homes with natural gas⁷³. In 2005, the system was expanded to include a subsidy for pensioners for district heating, and in 2006 it was supplemented by district heating and gas price subsidies provided to large families, which was the predecessor of the social compensation system (Energiaklub, 2009).

After 2007, probably to decrease unsustainable government spendings, the system was reformed and income categories were created to determine the size of the compensation, with this the universal compensation system was replaced with a social compensation system. The reform created a significant (almost 30% on average) increase in residential gas prices⁷⁴. The new system did not set a uniform price for everyone but operated based on income and the size of the household, so those in need got a larger compensation. Only consumers whose monthly net household income per consumption unit (calculated based on the members of the household) did not exceed three and a half times the minimum old-age pension were eligible for the subsidy (Energiaklub, 2009). Within this framework, four income categories have been established, each with varying subsidy rates, so the number of eligible consumers was significantly reduced. An annual consumption limit was set, above which no subsidy was offered, so it encouraged saving. Due to rising energy prices, to sustain the subsidy rates, an additional funding source was needed, so an income tax on energy suppliers was created in 2009 (Energiaklub, 2009). The system came to its end in 2011, after the change of the government. Then, in 2013, the 'utility cost reduction' programme was launched, which was no longer based on income but was granted to all residential consumers through government-regulated pricing (until its 2022 amendment).

⁷³ <https://index.hu/gazdasag/magyar/gazar/>

⁷⁴ https://hvg.hu/gazdasag/20061111_gaz

Other examples

A study⁷⁵ collected several examples of compensation given to citizens.

In Austria, the government taxes carbon emissions from October 2022, and this includes transport fuels. Companies have to pay €30 for every tonne of CO₂ they emit, and this additional cost is obviously passed on to consumers. To compensate the population, all adults who spent at least six months in the country in 2022 (regardless of nationality) received a one-off payment of €500, while those under 18 received €250, this is called climate bonus⁷⁶.

Switzerland introduced a carbon tax in 2008 for several fossil fuels which gradually increased from an initial 12 to 120 CHF per tonne⁷⁷. The tax is also payable on household fuels, for which all Swiss residents receive equal monthly cash compensation from the state, which encourages a reduction in the use of fossil fuels. One third of the revenue is used to reduce carbon emissions in buildings and to fund renewable energy and promote innovative companies, and two third is redistributed to the citizens.

In Ghana, the government subsidised fuel consumption with huge sums of money for years⁷⁸, which became unsustainable, but when the government tried to abolish this subsidy it led to massive protests, so they withdrew it. In 2005, the government finally succeeded in abolishing the subsidy without protests from the population, despite a 50 percent increase in fuel prices. This was achieved through thorough preparation, a huge media-campaign and the introduction of various financial compensations. The media campaign informed the population that the money that was previously used for fuel support, would be used for social purposes which support vulnerable communities a lot more than fuel support. The introduced supports included the abolition of tuition fees in state-run elementary and secondary schools, an increase in the number of public buses, a cap on public transportation fares, increased funding for healthcare, a raise in the minimum wage, and investment in the electrification of rural areas.

The Iranian government also kept fuel prices low with huge state subsidies before 2010, which led to an overconsumption. When the government abolished the subsidy, it increased domestic energy and agricultural prices by up to 20 times (IMF, 2011). This reform also did not lead to protests, thanks to thorough preparation, extensive information, and adequate compensation. 30% of the proceeds were given to companies to support energy-saving measures and energy efficiency investments, another 20% was allocated to the public sector to compensate for the increased energy costs and improve their energy efficiency. And the remaining 50% went directly to residents, except for the richest 20%. Compensation for higher fuel prices has benefited most families and the reform has increased social equality, since the poorest people had got almost no benefit from low fuel prices (they usually did not have cars),

⁷⁵ <https://theecologist.org/2023/mar/27/abolish-fossil-fuel-tax-breaks>

⁷⁶ <https://www.vindobona.org/article/climate-bonus-and-anti-inflation-bonus-come-earlier>

⁷⁷ <https://www.bafu.admin.ch/en/co2-levy-private-individuals>

⁷⁸ https://levegomunkacsoport.blog.hu/2022/06/11/egy_uzemanyagar-reform_fontos_tanulsagai

while the compensation paid by the government significantly improved their living conditions. However, after a few years, the has stalled and energy prices are once again well below their global levels, mostly because the government set the level of cash transfers well above new revenues from the price increases, and printed money to pay for the deficit which resulted in inflation, and also because of international sanctions targeting Iran's oil exports (Salehi-Isfahani, 2014).

Indonesia also subsidised the use of fuel with 2.2-2.8% of the GDP. The government tried to eliminate these subsidies since 1997 but failed each time because of wide protests, it finally succeeded in 2005-2008. The key of the success was also increased social subsidies, compensation for the poorest, improvements in healthcare and education, and an information campaign explaining the reforms to the population which helped the acceptance.

6.3 Additional attributes of the Hungarian housing stock most likely to be impacted by ETS2

Figure 13 shows the share of houses and apartments with lower (H-I) energy rating which are heated exclusively with natural gas in the different housing categories. The share of such houses is almost 50% in the case of vacant houses and occupied family houses, which are smaller than 80 m², but still very high in family houses which are larger, so basically in all single houses. While the share of apartments which are heated by gas and have low energy rating is a lot lower, especially in prefabricated housing complexes, where this ratio is less than 1%. Therefore, houses (both smaller and larger) are expected to be a lot more affected by ETS2 than apartments.

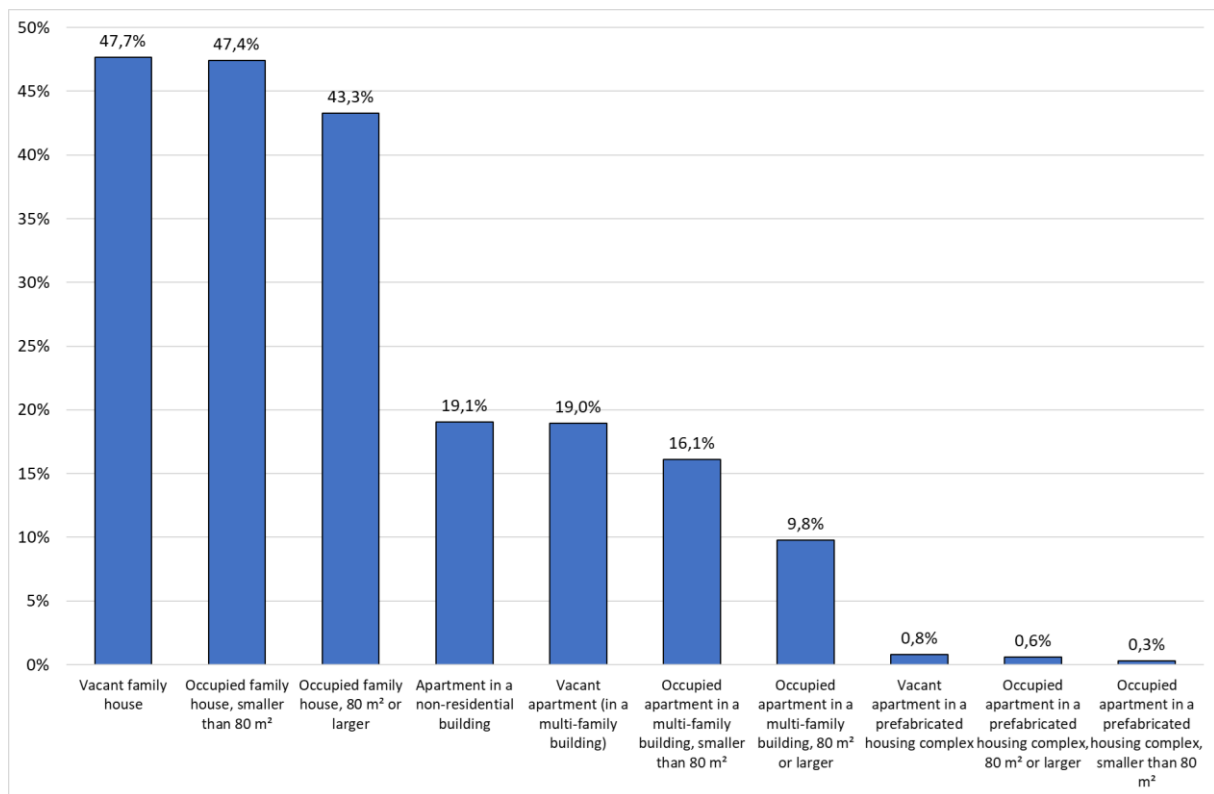


Figure 13: The share of houses and apartments with H-I energy efficiency rating and gas heating from the housing stock across housing categories. Data source: 2022 census based on the model by KSH and MEHI

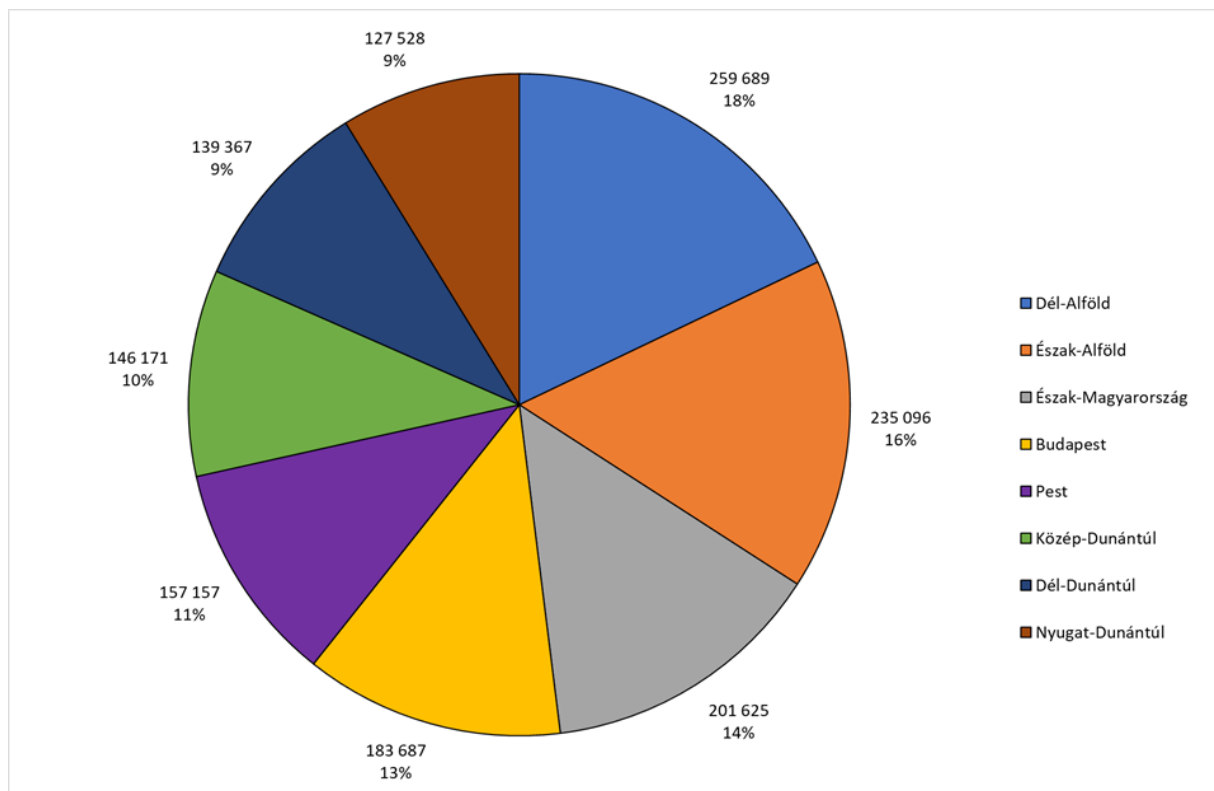


Figure 14: The distribution of houses and apartments with H-I energy efficiency rating and gas heating between NUTS2 regions. Data source: 2022 census based on the model by KSH and MEHI

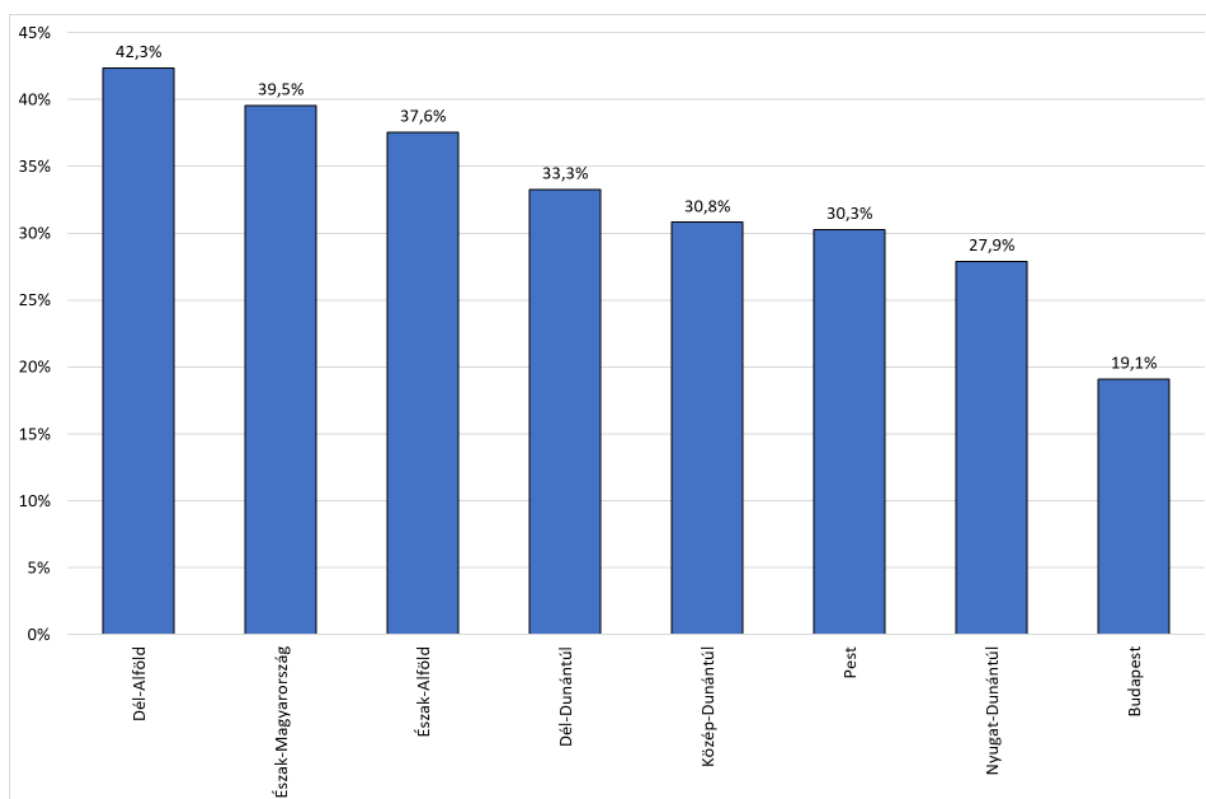


Figure 15: The share of houses and apartments with H-I energy efficiency rating and gas heating from the housing stock in NUTS2 regions. Data source: 2022 census based on the model by KSH and MEHI

7 REFERENCES

Antoine Dechezlepretre, Daniel Nachtigall, Frank Venmans (2022). The joint impact of the European Union emissions trading system on carbon emissions and economic performance. *Journal of Environmental Economics and Management*, Volume 118, March 2023, 102758

Bartek-Lesi, M., Szajkó, G., & Rácz, V. (2025). Egy év csúszással startol az ETS2: A 2028-ban induló klímavédelmi szabályozás bevezetésének hatása a hazai üzemanyag és földgáz árakra. REKK Policy Brief 08/2025. Regionális Energia- és Infrastruktúra-politikai Együttműködésért Alapítvány (REKK).

Commission Decision (EU) 2023/1575 of 27 July 2023 on the Union-wide quantity of allowances to be issued under the EU Emissions Trading System for 2024

Commission Delegated Regulation (EU) 2024/873 of 30 January 2024 amending Delegated Regulation (EU) 2019/331 as regards transitional Union-wide rules for harmonised free allocation of emission allowances

Directive 2023/959 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system

Energiaklub (2009). Ösztönzött pazarlás - Lakossági energiaárak állami támogatása 2003 - 2009. Összefoglaló elemzés

Energy Policy Group (2025). ETS2 in Romania: Turning Climate Policy into Economic Opportunity. EPG Policy Papers, November, 2025

Guillaume, D., Zyteck, R., & Farzin, M. R. (2011). Iran: The chronicles of the subsidy reform (Working Paper No. WP/11/167). International Monetary Fund.

International Carbon Action Partnership (ICAP), 2022: ETS Map, factsheet (<https://icapcarbonaction.com/en/ets/eu-emissions-trading-system-eu-ets>)

LIFE ETX (2024) EU ETS 101 – A beginner’s guide to the EU’s Emissions Trading System

López Hernández, J. F., Revision of the EU emissions trading system, European Parliamentary Research Service (EPRS), January 2026.

Magyar Energetikai és Közmű-szabályozási Hivatal – Magyar Távhőszolgáltatók Szakmai Szövetsége: *A magyar távhőszektor 2024. évi adatai*. 11. kiadás, Budapest, 2025. ISSN 2560-1156

Marcu, A., Kawnik, M., Vangenechten, D., & Bartosik, A. (2020). The role of the EU ETS funding mechanisms in delivering the European Green Deal. ERCST & CEEP.

Perdana, Sigit & Vielle, Marc, 2026. "Regional inequality of the European ETS-2," Energy Policy, Elsevier, vol. 208(C)

Regulation (EU) 2023/955 of the European Parliament and of the Council of 10 May 2023 establishing a Social Climate Fund and amending Regulation (EU) 2021/1060

Salehi-Isfahani, D. (2014). Iran's subsidy reform: From promise to disappointment (Policy Perspective No. 13). Economic Research Forum

WWF (2022). Where did all the money go? How EU Member States spent their ETS revenues – and why tighter rules are needed. WWF European Policy Office.
<https://www.wwf.eu/?8399416/Where-did-all-the-money-go-How-Member-States-spent-their-ETS-revenues>