

Recycling carbon pricing revenues for a socially just transition

Good practices and lessons for Social Climate Plans



Federal Ministry
for the Environment, Climate Action,
Nature Conservation and Nuclear Safety



European
Climate Initiative
EUKI



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Acknowledgement:

The JustReno project is part of the European Climate Initiative (EUKI). EUKI is a project financing instrument by the German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN). The EUKI call for project ideas is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. It is the overarching goal of the EUKI to foster climate cooperation within the European Union in order to mitigate greenhouse gas emissions.

Graphic design: Catherine Perry, www.swim2birds.co.uk

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How to cite this report: BPIE (Buildings Performance Institute Europe) (2026). Recycling Carbon Pricing Revenues for a Socially Just Transition: Good Practices and Lessons for Social Climate Plans.



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Executive summary

Across Europe, tens of millions of households spend a disproportionate share of their income on energy bills to ensure a minimum level of thermal comfort. Many live in buildings that are poorly insulated, heated by ageing boilers, and structurally incapable of responding to energy price signals. **When carbon pricing policies raise the cost of fossil fuels, these households bear the burden most acutely, if carbon pricing mechanisms are designed without revenue recycling mechanisms in place.** Revenue recycling refers to the deliberate return of carbon pricing proceeds to households and communities. When revenues are ringfenced, transparently governed and directed at the worst-performing buildings occupied by the most vulnerable people, carbon pricing can be a tool of social justice rather than an instrument of inequality.

The EU has established, through the new Emissions Trading System for buildings and road transport (ETS2) and the Social Climate Fund (SCF), a solid regulatory framework for Member States to develop a long-lasting legal infrastructure for revenue recycling at national level. The SCF regulation entered into force in 2023 and requests for funds can be submitted as of end July 2026. With mandatory 25% co-financing from Member States, the fund is expected to mobilise at least €86.7 billion between 2026 and 2032.¹ However, ETS2 trading, originally planned for 2027, was formally postponed to 2028 by EU Council and Parliament decision in March 2026.²

The legislative architecture is therefore in place and the SCF is already operational. What remains uncertain is whether the political conditions for full ETS2 implementation will hold, and whether Member States will design their Social Climate Plans with the ambition the instrument makes possible. The Energy Performance of Buildings Directive (EPBD) recast of 2024 reinforces this ambition through Article 17, which requires Member States to design financial incentives that prioritise vulnerable households and those affected by energy poverty and deploy the SCF consistently with the path to a zero-emission building stock by 2050.

¹ https://climate.ec.europa.eu/areas-action/carbon-markets/ets2-buildings-road-transport-and-additional-sectors_en
² icapcarbonaction.com/en/news/eu-officially-adopts-2040-climate-target-postpones-ets-2-one-year



A central finding of this report is that **the effectiveness of revenue recycling depends above all on the quality of Social Climate Plan design**. This means identifying worst-performing buildings and their overlap with vulnerable households with sufficient precision to target investment and prioritise structural measures over temporary income support. Temporary income support can play a legitimate bridging role for households who cannot yet access renovation. However, evidence from Austria and Poland suggests there is a risk that when income support runs alongside structural investment without a clear sequencing logic, it risks dampening the price signals and demand for clean heating and renovation programmes. Article 8 of the SCF Regulation reflects this: it lists structural measures as the core eligible investments and allows income support only as a supplementary and decreasing component, capped at 37.5% of total plan costs.

This report reviews good practice cases for revenue recycling from Ireland, Austria, British Columbia, Chile, Denmark, Switzerland and Germany to summarise what lessons can be learned for Member States to consider as they write their Social Climate Plans. None of the cases offers a directly transferable blueprint as each reflects a specific national context. Together, however, they demonstrate some of the existing design choices for revenue recycling and provide an idea of what works effectively and what does not. The lesson from these examples is that **successful revenue recycling mechanism must be statutory, targeted, and visible to the individual households it reaches**.

The report also draws practical recommendations for Member States preparing their Social Climate Plans. It argues that a well-designed plan is not primarily a reporting obligation to the European Commission, but an instrument through which a Member State can direct unprecedented EU resources to the households and buildings that need them most, build the national data foundation that serves multiple policy obligations simultaneously, and demonstrate that ETS2 can work for the people it is most often accused of harming. **The SCF provides the resources and the mandate, but the design choices that Member States make now will determine whether those resources reach the people they are intended to serve.**



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1. Introduction

In the winter of 2018, France's gilets jaunes (yellow vest) protesters brought the streets of Paris to a standstill. The immediate trigger was a planned fuel tax increase, framed by the government as a climate measure. To the protesters, many of them from rural areas and in lower-paying jobs, with no access to public transport and no means to buy an electric car, the tax felt like an additional burden to their daily life. The government backed down and the fuel tax was scrapped.

The story is often used as an example to call for caution on carbon pricing policy, but what preceded the protest was a failure of policy design. The French government had introduced a carbon price without a meaningful revenue recycling mechanism. This means the policy was designed without visible compensation, targeted support for those most exposed, or transparency on or credible commitment for how the money would be used, redistributed or invested in ways that benefited society. Rather than being opposed to climate action, the protest was against a policy designed without social safeguards or a convincing mechanism for its effectiveness.

The EU's SCF was developed to avoid similar design flaws at EU level. It aims to ensure that the new Emissions Trading System for buildings and road transport (ETS2) does not burden those least able to absorb the costs but leads to workable, fair and durable outcomes. By integrating recycling of ETS2 revenues, it enables carbon pricing to function as an effective and equitable market tool for climate action.

This report aims to address a set of recurring concerns raised by EU Member States and other stakeholders: What does revenue recycling mean in practice? Which measures can be supported through carbon pricing revenues? How should funds be ringfenced and how do they reach vulnerable households? What types of renovations, in what kinds of buildings, for which residents? And how can local needs and existing municipal programmes be recognised and complemented? These questions are not merely technical but must be answered in the socio-political context of each Member State. The quality of chosen measures in Social Climate Plans directly determines to what extent ETS2 can deliver on its social promise.



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2. Concepts and terminology of revenue recycling

2.1. The economic case for climate action and carbon pricing

Addressing the changing climate is increasingly becoming an economic necessity, as the costs of inaction are growing. The EU experienced cumulative economic losses of approximately €822 billion from weather- and climate-related extreme events between 1980 and 2024, and these losses are accelerating, with annual losses exceeding €40-50 billion per year between 2021 and 2024.³ Looking further ahead, the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report finds that the macroeconomic cost of mitigation is small: limiting warming to 2°C would reduce average annual global GDP growth by only 0.04–0.09 percentage points between 2020 and 2050, while most of the assessed literature finds that the economic benefits of staying within 2°C outweigh these costs. Damage costs are not considered in this scenario but will rise considerably at higher levels of warming; the European Commission is set to reflect this risk by introducing a common climate reference scenario based on a 3°C trajectory in its forthcoming integrated framework on climate resilience.⁴ Climate policy must therefore be understood not only as an environmental imperative but as an investment in the long-term economic resilience and competitiveness of the EU economy.

³ <https://www.eea.europa.eu/en/analysis/indicators/economic-losses-from-climate-related>

⁴ <https://www.europarl.europa.eu/legislative-train/theme-a-new-plan-for-europe-s-sustainable-prosperity-and-competitiveness/file-european-framework-for-climate-resilience-1>



Within this context, carbon pricing is among the most widely used policy instruments for reducing greenhouse gas emissions, precisely because it addresses the market failure of unpriced carbon at relatively low economic cost. Emissions trading or carbon taxes create a price signal that encourages cost-efficient emissions reductions across carbon-intensive sectors, drives innovation towards low-carbon alternatives, and generates revenues that can be used for public benefit. The instrument's economic logic rests on making emissions costly, thereby incentivising both producers and consumers to shift behaviour and invest in low-carbon solutions while using the resulting revenues to manage the distributional consequences of that shift.

2.2. The core concept of revenue recycling

The distributional and economic viability of carbon pricing depends critically on the design of revenue recycling schemes, how the generated revenue is distributed and what it is used for.⁵ **Revenue recycling refers to the deliberate use of carbon pricing proceeds to return value to households, businesses or public infrastructure via different delivery mechanisms, such as tax reductions, direct transfers, structural public investment or a combination of these.** The choice of delivery mechanisms directly influences the public acceptance of carbon pricing policies; in particular, monetary redistribution schemes, such as cash transfers or tax cuts, and green public investment have a positive effect on the acceptability of carbon pricing policies.⁶ A study of Norwegian households and companies found they were mostly like to accept the highest level of simulated carbon tax when revenues were used both to finance climate change mitigation efforts and to reduce rural–urban inequalities.⁷ In Ireland, revenue recycling was found to help bridge the ideological gap between centre-right and left-wing parties around the Irish carbon tax, by addressing left-wing concerns about the policy's regressive effects.⁸

Carbon pricing for fuels used in buildings and transport, which directly affects the energy costs of ordinary households and small businesses, makes the question of how revenues are recycled especially consequential. Recycling this revenue for social and environmental goals is not optional but essential to the legitimacy and effectiveness of carbon pricing.

Revenue recycling takes different forms depending on how revenues are governed and how they are returned.

5 <https://www.sciencedirect.com/science/article/abs/pii/S0939362526000282>

6 <https://publications.jrc.ec.europa.eu/repository/handle/JRC146580>

7 <https://www.tandfonline.com/doi/full/10.1080/14693062.2024.2401853#abstract>

8 <https://onlinelibrary.wiley.com/doi/full/10.1111/ropr.12625>



Governance of revenue

There are two main models for revenue recycling, which differ in how the revenue raised is integrated into public budgets:

- **Legal earmarking** binds revenues to specific expenditure categories through legislation, making it difficult for subsequent governments to redirect the money. Revenues earmarked for specific social and environmental purposes generate higher public acceptance than revenues pooled into the general budget, largely because earmarking helps to reduce public distrust that governments will use the funds appropriately.

Survey-based evidence from Switzerland confirms that earmarking revenues for environmental purposes significantly increases the acceptability of carbon taxes compared to returning them to the general budget⁹. Ireland's statutory ring-fence of carbon tax revenues for welfare and retrofit programmes is an example. The OECD notes that legal earmarks are more common in emissions trading systems than in carbon taxes, with close to two-thirds of countries with emissions trading systems applying legal earmarks to auction revenues.

- **Hypothecation refers** to a political communication that revenues will be used for a stated purpose, without a binding legal structure. While often used interchangeably with earmarking, the distinction is relevant as hypothecated commitments are vulnerable to changes in government, as illustrated by Austria's Klimabonus which was discontinued after the elections in 2024.

One of the most important questions in revenue recycling is how the money is redistributed across society. In broad terms, revenues can either be returned directly to households and taxpayers as financial support or invested in structural measures that permanently reduce energy costs. Below are the main forms each approach can take.

⁹ <https://wires.onlinelibrary.wiley.com/doi/10.1002/wcc.531>

¹⁰ <https://doi.org/10.1007/s10018-016-0144-7>

¹¹ https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/06/the-use-of-revenues-from-carbon-pricing_f0fcd296/3cb265e4-en.pdf



Returning revenue to households and taxpayers

- **Revenue neutrality** works like a full refund. Every euro raised through the carbon price is returned, so the government collects no more net revenue but cuts income tax or labour taxes for residents. The limitation is that tax cuts benefit those who pay more tax, so higher-income households tend to gain more, while households with low or no taxable income see little return. Modelling of a revenue-neutral carbon tax in the United States confirms that recycling through labour tax cuts is insufficient to protect the purchasing power of lower-income households, in contrast to other forms of returning revenue such as per capita dividends.
- **A carbon dividend/climate premium** works like a universal flat payment. The same fixed amount is paid to every resident, regardless of income or how much fossil fuel they consume. Because lower-income households typically spend less on fossil fuels than higher-income ones, but receive the same payment, they tend to get back proportionally more than they paid in. This makes the carbon dividend a more equitable option than tax cuts for households with lower incomes. Combining a carbon tax with a per capita dividend makes a majority of households net beneficiaries, with the largest gains among those in the lower half of the income distribution. Combining a carbon tax with a per capita dividend makes 56% of people net beneficiaries, including 84% of those in the bottom half of the income distribution (assuming a carbon tax of \$50/t). The primary political advantage of this model is the universal visibility as every resident is a beneficiary.

Investing in structural measures

- **Targeted structural investment** directs revenues to specific programmes such as building renovation grants, heat pump subsidies or social housing upgrades, rather than returning cash to citizens. Rather than helping households to afford a high energy bill, structural investments reduce the bill itself. This is the primary model envisaged by the EU SCF. Structural investments are often seen as a more effective return mechanism, since they address the structural causes of social issues such as of energy poverty rather than compensating for them. A comparative economic modelling study in the UK found that direct energy bill support provides immediate but short-lived relief for fuel-poor households, while public investment in home retrofits generates a sustained reduction in energy costs over time, making renovation the more durable intervention for structural energy poverty.

¹² <https://doi.org/10.1016/j.ecolecon.2019.04.016>

¹³ <https://doi.org/10.1016/j.ecolecon.2019.04.016>

¹⁴ <https://www.sciencedirect.com/science/article/pii/S2214629626000599>



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3. EU policy framework

3.1. Emission trading schemes in the EU

The EU Emissions Trading System (EU ETS) was launched in its first form in 2005 and is a key policy instrument for regulating and reducing carbon emissions in the EU. It builds on the distribution and possible trading of a fixed number of emission allowances (i.e. a cap-and-trade system), creating a carbon market and an incentive for cost-efficient emissions reduction. To emit one tonne of CO₂-equivalent, regulated operators must hold and surrender one allowance per tonne of verified emissions, reported and reconciled annually. Auction revenues flow primarily to Member State budgets and EU-level funds, supporting a broad range of climate, energy and just-transition measures, including renewables, energy efficiency, low-carbon innovation, clean mobility and social support programmes. To date, EU ETS has applied to emissions from specified installations and operators in electricity and heat generation, energy-intensive industry sectors, aviation and maritime transport.

ETS2 is a new and separate emissions trading system that will cover emissions from fuels used in buildings and road transport and some small industries not already covered by EU ETS. A key difference is that under ETS2, it is the fuel suppliers rather than the users (i.e. households or car owners) who will be regulated and obliged to hold allowances and report their emissions within the system. The carbon cost is therefore embedded in fuel prices upstream, making it less visible to consumers, though they would feel the effect on household energy bills. All ETS2 allowances will exclusively be auctioned, with a share of the resulting revenues flowing to the SCF. Under the current legislative framework, ETS2 trading is scheduled to commence in 2028, following a formal one-year postponement adopted by the EU Council and European Parliament in March 2026¹⁵ A further one-year delay to 2029 remains theoretically possible under the safety brake mechanism in the ETS Directive, though 2028 has been formalised as the standard date. A price stability mechanism caps allowance prices at €45 per tonne CO₂ equivalent until 2030 should market conditions become volatile. Political pressure to further delay or weaken ETS2 remains active in several Member States, and a legislative review clause allows the ETS Directive to be reopened in the third quarter of 2026, creating residual uncertainty about the instrument's final scope and timeline.¹⁶

¹⁵ <https://icapcarbonaction.com/en/news/eu-officially-adopts-2040-climate-target-postpones-ets-2-one-year>

¹⁶ https://institutdelors.eu/content/uploads/2025/11/PP317_ET2_Nguyen_EN.pdf



3.2. The Social Climate Fund

The SCF, established by Regulation (EU) 2023/955, is the EU's principal instrument for ensuring that ETS2 does not deepen inequality. It is designed explicitly for redistribution and to target the vulnerable. The regulation acknowledges: *“The increase in the price for fossil fuels can disproportionately affect vulnerable households, vulnerable micro-enterprises and vulnerable transport users who spend a larger part of their income on energy and transport, who, in certain regions, do not have access to alternative, affordable mobility and transport solutions, and who may lack the financial capacity to invest in the reduction of fossil fuel consumption.”* (Recital 11 of the Regulation (EU) 2023/955). The SCF defines vulnerable households as those experiencing energy poverty, including those on low and lower-middle incomes, and which lack the means to renovate the building they occupy. Vulnerable micro-enterprises are those which do not have the means to renovate the building they occupy, purchase zero- and low-emission vehicles or switch to alternative sustainable modes of transport, including public transport.¹⁷

From 2026 to 2032, the SCF is expected to mobilise €86.7 billion, combining revenues from ETS2 allowance auctions with mandatory national co-financing of at least 25% of the estimated total costs of each Member State's Social Climate Plan.¹⁸ This figure is contingent on ETS2 operating as currently scheduled and on Member States submitting and having their Social Climate Plans approved by the Commission. The deadline for Member States to submit their Social Climate Plans was 30 June 2025. Sweden, Lithuania, Malta, Greece and Latvia have received formal Commission approval for their plans, while the Netherlands, Italy, Luxembourg and Croatia have submitted drafts currently under assessment. The remaining Member States have yet to submit.¹⁹ These plans must identify vulnerable households, micro-enterprises and transport users at risk from ETS2 cost pass-through, and must set out how funding will reach them, primarily through structural investment in building renovation, clean heating and low-emission mobility, and where necessary through temporary direct income support. These measures specified must be planned between 2026 and 2032. The Commission assesses plans for adequacy before disbursing funds based on set key milestones and targets for each measure.

Unlike domestic ETS2 revenues which remain in Member State budgets, the SCF operates as an EU-wide mechanism that reallocates funds across Member States, directing proportionally more towards countries with higher rates of energy poverty and lower fiscal capacity. In February 2026, the European Investment Bank approved a €3 billion financing initiative, or “Frontloading Facility”, to fast-track energy efficiency upgrades for low- and middle-income households and small businesses across Europe in the context of ETS2 deployment.²⁰

¹⁷ <https://eur-lex.europa.eu/EN/legal-content/summary/social-climate-fund.html>

¹⁸ https://employment-social-affairs.ec.europa.eu/policies-and-activities/funding/social-climate-fund_en

¹⁹ https://employment-social-affairs.ec.europa.eu/policies-and-activities/funding/social-climate-fund/social-climate-fund-national-plans_en

²⁰ <https://www.eib.org/en/press/all/2026-044-eib-stands-ready-to-frontload-future-revenues-from-emissions-trading-and-provide-financing-to-member-states-to-fast-track-investments-that-cut-energy-bills-for-households-and-small-businesses>



Each Member State can receive a maximum from the SCF based on a formula that includes the following variables: total population, population at risk of poverty living in rural areas, percentage of households at risk of poverty with arrears on their utility bills, GNI per capita measured by the purchasing power standard, overall GHG emissions, and CO₂ emissions from fuel combustion by households. The greatest beneficiaries of SCF funding will be Poland (17.60%), France (11.19%), Italy (10.81%), Spain (10.52%), and Romania (9.25%). However, smaller countries also benefit strongly on a per capita basis, such as Czechia (2.4%), Hungary (4.33%) and Slovakia (2.35%). Translating these allocations into projected numbers of households or buildings supported is not yet possible, as this depends on the instruments Member States choose in their Social Climate Plans. What the allocations do make clear is the scale of the opportunity. Romania's EU contribution alone, between €5.05 billion and €6.01 billion over 2026 to 2032, represents a multiple of its current annual public spending on building renovation. Poland's share of 17.6% of €86.7 billion amounts to approximately €15.3 billion including co-financing.

What does the SCF allow Member States to fund?

The SCF Regulation (EU) 2023/955 allows two types of measures: structural green investments that decrease fossil fuel consumption over time, and temporary direct income support. According to Article 8(1), examples relevant for the building sector are:

- Energy renovation of buildings occupied by vulnerable households and micro-enterprises, including tenants and social housing residents
- Access to affordable energy-efficient housing, including social housing
- Building decarbonisation, such as electrification of heating, cooling and cooking
- Targeted information and advice to households on available renovation support, energy efficiency measures and affordable low-carbon mobility alternatives
- Support to public and private bodies, including social housing providers and public-private cooperatives, in developing and delivering affordable energy efficiency solutions aligned with the Fund's social objectives
- Integration of renewable energy generation and storage at building level.

Article 8(2) states that Member States may include in the estimated total costs of the plans the costs of measures providing direct income support to vulnerable household to reduce the impact of heating fuel prices. Such measures are to be temporary and decrease over time and shall not represent more than 37.5% of the estimated total cost of the Social Climate Plan.



3.3. Other key EU legislation

There are various EU legislations that are relevant especially for the structural measures to be outlined in the national Social Climate Plans:

ETS2 Directive (EU) 2023/959	Establishes ETS2, defines the cap, auctioning rules and obligation to channel a share of revenues to the SCF. Requires Member States to use domestic revenues consistently with climate and social objectives.
Social Climate Fund Regulation (EU) 2023/955	Establishes the SCF, defines eligible measures, Social Climate Plan submission requirement, and 2026-2032 disbursement schedule. Sets the €65 billion envelope and defines vulnerable households, micro-enterprises and transport users as target groups.
EPBD (EU) 2024/1275, Art. 17, Financial incentives, skills and market barriers	Requires Member States to make best cost-effective use of all available EU and national funding sources (explicitly including the SCF and ETS auction revenues) in ways consistent with achieving a zero-emission building stock by 2050. Art. 17.6 names the SCF directly.
EPBD Recast, Art. 9, MEPS	Introduces minimum energy performance standards (MEPS) for buildings. While the EPBD does not mandate MEPS for residential buildings at EU level, Member States may choose to extend them to the residential sector. MEPS create structural pressure to renovate worst-performing buildings and interact directly with revenue recycling mechanisms.
EPBD Recast, Art. 3, NBRPs	Requires Member States to publish national building renovation plans (NBRPs) setting out renovation trajectories, financing roadmaps, and measures addressing worst-performing buildings and vulnerable households. NBRPs are the planning companion to Social Climate Plans.
EED (EU) 2023/1791, Art. 22	Defines energy poverty and vulnerable customers, and requires Member States to ensure that energy efficiency improvement measures reach vulnerable households, people experiencing energy poverty, and social housing residents. Provides definitions that can be used in Social Climate Plans to identify target groups.
Recovery and Resilience Facility (EU) 2021/241	Has funded significant building renovation investment in several Member States. Its interaction with the SCF, including double-funding prohibitions, requires careful management in Social Climate Plans.



As the above shows, there is already extensive legislation in place that supports in particular the roll-out of structural measures to use revenues from ETS2 to improve the quality of EU buildings. For example, the Energy Performance of Buildings Directive (EPBD) sets out the EU's path towards a fully decarbonised building stock in 2050. Along with decarbonisation, renovation and digitalisation, the issue of financing the necessary investments in buildings while protecting vulnerable households from excessive economic burdens is a main theme in the 2024 EPBD recast. A key article in this regard is Article 17 on financial incentives, skills and market barriers.

*Article 17.6: Member States shall make best cost-effective use of national financing and financing available established at Union level, in particular the Recovery and Resilience Facility, **the Social Climate Fund**, the Cohesion fund, InvestEU, **auctioning revenues from emission trading** pursuant to Directive 2003/87/EC of the European Parliament and of the Council and other public funding sources. Those funding sources shall be deployed consistently with a path to achieving a zero-emission building stock by 2050.*

Another important integration point for the practical design of revenue recycling is the national building renovation plan that each Member State must publish under Article 3 of the EPBD recast. NBRPs were to be submitted to the Commission end 2025 with a final deadline on 31 December 2026. NBRPs must include a financing roadmap that sets out how the renovation of the national building stock will be funded through to 2050 and must specifically address the needs of worst-performing buildings and vulnerable households. While the NBRP obliges Member States to collect data on the worst-performing buildings and separately on energy poverty, the SCF mandates the identification of the number of vulnerable households. JustReno has been working on proposing a methodology (BPIE, forthcoming) to identify the overlap of worst-performing buildings with vulnerable households.



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4. Revenue recycling and Social Climate Plans

4.1. Identifying vulnerable households and worst-performing buildings

The effectiveness of revenue recycling mechanisms depends critically on identifying who needs support and where. This is particularly true for structural investment measures, where targeting the right buildings and households is a precondition for both social impact and cost-effectiveness. For financial transfer mechanisms such as per capita dividends or tax credits, identification requirements are less demanding, but for renovation grants, heating system upgrades and energy performance contracting, the quality of targeting determines whether public investment reaches those with the greatest need or defaults to those most able to navigate application processes. Vulnerability to energy prices and susceptibility to energy poverty can be determined by two main factors:

- 1 The general vulnerability of a person – including low income, precarity, disability, age and gender.** The SCF Regulation (EU) 2023/955 explicitly requires Member States to identify and target vulnerable households in their Social Climate Plans, defined as households experiencing energy poverty or at risk of it. The Energy Efficiency Directive (Art. 22) provides a definition of energy poverty Member States can use to anchor their identification methodology, covering households spending a disproportionate share of income on energy, or unable to adequately heat or cool their homes.
- 2 The quality of the building that a person lives in.** A poorly performing building traps its inhabitants regardless of income: occupants of highly inefficient dwellings face structurally elevated energy costs that cannot be meaningfully reduced without physical intervention. Worst-performing buildings are those in the lowest energy performance classes.

¹⁵ <https://icapcarbonaction.com/en/news/eu-officially-adopts-2040-climate-target-postpones-ets-2-one-year>

¹⁶ https://institutdelors.eu/content/uploads/2025/11/PP317_ET52_Nguyen_EN.pdf



Identifying worst-performing buildings in practice depends on the quality and coverage of national energy performance certificate (EPC) systems, which have historically varied significantly across Member States in methodology, scale and completeness. Article 19 of the EPBD recast of 2024 introduces a harmonised A to G scale across all Member States, where class G must cover at least the worst-performing buildings in each country, with transposition required by May 2026. However, the European Commission opened infringement procedures against all 27 Member States for failing to fully transpose the EPBD.²¹ Coverage gaps in national EPC registries remain a practical obstacle, particularly in countries with an older building stock built before energy certification requirements were introduced. Such Member States may need to supplement EPC data with alternative proxies for building performance, such as construction year, heating system type or local energy poverty indicators, to identify the worst-performing buildings where vulnerable households live for their Social Climate Plans.

An important nuance is that worst-performing buildings do not house only low-income households. In Central and Eastern European multi-family apartment blocks in particular, occupants with a range of incomes may live in the same building, all experiencing the consequences of poor building performance. The key target for Social Climate Plans is therefore the intersection of building and household vulnerability, identifying the worst-performing buildings where the most vulnerable people live. This is also where investment delivers the greatest return: reducing energy costs for those who can least afford them, cutting emissions from the most carbon-intensive dwellings, and addressing the structural causes of energy poverty rather than compensating for them.

Investing in this identification exercise has value well beyond the immediate requirements of the SCF. The spatial and social data infrastructure that Member States must build to identify worst-performing buildings and vulnerable households for their Social Climate Plans (e.g. integrating EPC data, energy poverty indicators, and social protection registers at local or municipal level) is equally valuable for a range of other policy objectives. National building renovation plan delivery under EPBD Article 3 requires overlapping data to set renovation trajectories and financing roadmaps. Cohesion policy allocation under the 2021–2027 programming period targets overlapping geographies of social vulnerability and poor housing quality. Public health planning depends on the same household and building-level evidence. Member States that treat Social Climate Plan preparation as an opportunity to build this shared data foundation, rather than as a minimum compliance exercise, will generate policy returns across multiple budgets from a single investment. This will allow them to connect various policy objectives and take a more geographically targeted approach to creating policy impact, by prioritising areas where vulnerabilities and unaffordability converge.

Table 1 shows the two factors of vulnerability. The highest-priority interventions are at the intersection, where worst-performing buildings are inhabited by vulnerable households. This is also where SCF and NBRP instruments should reinforce each other.

21 https://energy.ec.europa.eu/news/commission-calls-eu-countries-transpose-reinforced-rules-energy-performance-buildings-2026-07-15_en



Household vulnerability	Building vulnerability
Income poverty, precarity, social exclusion, disability, age	Worst-performing buildings that are high emitters and energy consumers and cause high energy bills regardless of occupant income
Addressed through Social Climate Plans, legislated under the SCF regulation	Addressed through national building renovation plans, legislated under the EPBD

Table 1: Building and household vulnerability

4.2. Using revenues for structural measures

As a policy instrument, revenue recycling can only deliver its potential if the mechanisms through which it is implemented are well designed. Of the various delivery mechanisms for revenue recycling, at EU level with the Social Climate Plan, there is a clear legislative preference for structural measures. As seen above, the SCF Regulation explicitly prioritises investment in building renovation, clean heating systems and low-emission mobility over temporary income support (SCF Regulation (EU) 2023/955, Art. 8).

The need for precise identification of the overlap between worst-performing buildings and vulnerable households is most acute for structural renovation investment. According to the European Commission, three-quarters of the EU building stock was built before 2000 and has poor energy performance, yet the annual renovation rate remains at around 1%. Deeply renovating just 10% of the worst-performing buildings would cut total buildings-related emissions by 20% and reduce ETS2 emissions by 8%.²² The return on targeting the worst-performing buildings with structural measures from revenue recycling is therefore enormous.

For a per capita dividend or an income transfer, identifying where vulnerable households live and in what kind of building is irrelevant as the payment flows directly to the household regardless of location or housing stock characteristics. For a renovation grant, by contrast, the intervention is the building itself and requires knowing precisely which buildings house which households.

This means, above all, that Member States must identify worst-performing buildings and the vulnerable households living in them with precision, and must design and target delivery mechanisms accordingly. They must decide who to target, at what speed and with what conditions. The choice of mechanism is not merely technical: evidence from previous EU programming periods shows that poorly designed structural investment programmes have disproportionately benefited higher-income households with greater capacity to navigate application processes and access co-financing, while failing to reach those in deepest energy poverty.

²² <https://www.bruegel.org/policy-brief/how-finance-european-unions-building-decarbonisation-plan>



Different mechanisms for structural investments carry different risk–benefit profiles depending on the target group and the national institutional context. A comprehensive review by Bertoldi et al. (2020)²³ provides the foundational overview of these instruments across EU Member States. **Below is an overview of possible mechanisms for revenue recycling that Member States can choose.**

Grants and direct subsidies

The most straightforward mechanism is public funds to cover renovation costs, with no repayment obligation. Grants are often the only instrument that will reach the most vulnerable households, since any repayment obligation can be a barrier for households with a low credit score.²⁴ Ireland's Warmer Homes Scheme offers grants of up to 100% of renovation costs for qualifying low-income homeowners. The risk is that grant programmes can be administratively demanding and may, without careful targeting, disproportionately benefit higher-income households with more capacity to navigate application processes. A review of EU structural funds spending on energy efficiency in buildings during 2014–2020 found low cost-effectiveness precisely because of inadequate targeting, with grants frequently crowding out private investment that would have occurred regardless.²⁵

The worst-performing buildings are ideal for grants and tax incentives because of their high energy- and emissions-saving potential, mean a bigger return on investment compared to more energy-efficient buildings.²⁶ Bruegel estimated that deeply renovating 10% of the worst-performing buildings would cut total buildings-related emissions by 20% and lower ETS2 emissions by 8%.²⁷

Loan guarantees and zero-interest loans

For households with some financial capacity but who are unable or unwilling to access commercial credit at market rates, public loan guarantees can de-risk private financing. Zero-interest loans, such as those offered through the KfW programme in Germany or the Sustainable Energy Authority of Ireland, go further, reducing the cost of borrowing to zero while keeping repayment obligations. Loan-based instruments are predominantly accessed by higher-income households with the collateral and administrative capacity to engage with lending institutions; zero-interest green loans therefore carry an inherent trade-off between cost-effectiveness and distributional fairness.²⁸

23 <https://wires.onlinelibrary.wiley.com/doi/10.1002/wene.384>

24 <https://wires.onlinelibrary.wiley.com/doi/10.1002/wene.384>

25 <https://climate-advisory-board.europa.eu/reports-and-publications/towards-eu-climate-neutrality-progress-policy-gaps-and-opportunities>

26 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52021SC0453>

27 <https://www.bruegel.org/policy-brief/how-finance-european-unions-building-decarbonisation-plan>

28 <https://www.bruegel.org/policy-brief/how-finance-european-unions-building-decarbonisation-plan>



Upfront payment/frontloading

Here, public funds cover renovation costs before the work is carried out, with possible partial repayment from future energy savings or at the point of property sale. This mechanism can break the upfront capital barrier while recovering some public investment but requires sophisticated public financial management and robust energy performance certification to calculate savings credibly. Frontloading is particularly relevant for asset-rich but income-poor households, such as elderly homeowners in low-value properties who own their home but cannot access renovation finance.

Energy performance contracting and on-bill repayment

Under energy performance contracts, an energy service company designs, finances and delivers renovation works, recovering costs from the guaranteed energy savings over an agreed period, typically six to fifteen years. On-bill repayment schemes allow the cost to be recovered through the energy bill itself, reducing the perceived financial risk for households. These models are more common in social housing and multi-family building contexts, where the scale justifies the transaction costs and where a single owner (e.g. a housing association) can enter the contract on behalf of all residents.

One-stop shops

One-stop shops aggregate administrative, technical and financial support for households in a single access point, reducing the informational burden that often prevents take-up of renovation support among low-income households. A comparative analysis of 63 one-stop shop cases across Europe found them to be instrumental in addressing the multiple barriers preventing renovation, including information gaps, coordination complexity and lack of trusted contractor networks.²⁹ The EPBD recast (Art. 17) explicitly requires Member States to ensure one-stop shops cater specifically to vulnerable households and those experiencing energy poverty.

²⁹ <https://www.sciencedirect.com/science/article/pii/S0378778821005570>



4.3. The risk of income support displacing structural investment

The SCF Regulation permits temporary direct income support as a supplementary and transitional measure, capped at 37.5% of total plan expenditure. This flexibility is appropriate for households who cannot yet access structural renovation. However, a study analysing Austrian energy crisis support measures finds that the broad compensation measures implemented between December 2021 and May 2023 generally lacked social targeting, and that broad untargeted transfers tend to impede the price signals that would otherwise incentivise energy savings.³⁰ A dynamic economic modelling study using UK data found that direct energy bill support provides immediate relief for all fuel-poor households but produces only a short-lived economic stimulus, whereas public investment in home retrofits generates a sustained boost over time as fuel-poor households save on energy bills.³¹

In Poland, the government introduced a scheme allowing municipalities to distribute subsidised coal to households at preferential prices, active from October 2022 to April 2023.³² This measure made continuing to operate an old coal boiler cheaper in the short term, directly reducing the financial incentive to replace it with a heat pump or undertake renovation. Meanwhile, heat pump sales in Poland fell 35% in 2024 compared to 2023, a decline attributed in part to the stop-start nature of renovation subsidies without proper checks and balances.³³ Where income support and structural investment run simultaneously without clear sequencing, income support risks crowding out the structural transition the SCF is designed to enable. Social Climate Plans should treat income support as explicitly time-limited and tied to a credible ramp-up of structural investment, rather than as a main measure in itself.

4.4. The landlord–tenant split incentive

A structural barrier that cuts across all building types is the split incentive between landlords and tenants. In the private rented sector, which houses a disproportionate share of Europe's energy-poor households, tenants pay the energy bills but have no authority to commission renovations while landlords have little incentive to invest in renovations.³⁴ On average across the EU, privately renting a home consumes up to 35% of the disposable income of lower-income households, defined as those below 60% of the median disposable income. A comprehensive review of 108 policies across Europe found that existing energy efficiency measures inadequately target the private rented sector, often overlooking its structural barriers and leaving both tenants and landlords poorly served.³⁵ The result is that the worst-performing rental properties can remain unrenovated indefinitely, even where finance is in principle available.

EPBD Article 9 introduces the possibility of minimum energy performance standards. These apply to non-residential buildings, and Member States may choose to apply them to residential buildings, creating a legal obligation on landlords to renovate. This helps to overcome the split incentives for investments but does not automatically ensure a fair distribution of costs or the protection of vulnerable households. Revenue recycling mechanisms should accompany such obligations with the financial support needed to make compliance achievable, while including conditions that protect tenants from post-renovation rent increases.

³⁰ researchgate.net/publication/388217148

³¹ <https://www.sciencedirect.com/science/article/pii/S2214629626000599>

³² https://static.eurofound.europa.eu/covid19db/cases/PL-2022-44_3109.html

³³ ehpa.org/news-and-resources/press-releases/steady-heat-pump-subsidy-scheme-key-to-cleaner-polish-air/

³⁴ <https://www.sciencedirect.com/science/article/abs/pii/S2214629622003358>

³⁵ <https://www.tandfonline.com/doi/full/10.1080/15567249.2025.2558542>



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5. Good practices in revenue recycling

The cases presented in this chapter are drawn from across Europe and beyond. They are selected not because they are perfect models but because each demonstrates a design feature or institutional lesson that is relevant to how Member States can approach Social Climate Plan development.

The SCF gives clear priority to structural measures such as building renovation, clean heating systems and low-carbon mobility that permanently reduce household energy costs. Yet many of the cases reviewed here are primarily financial recycling models directly returning revenues to households rather than structural investment programmes.

The cases reflect the current state of international practice. Comprehensive, well-documented and evaluated examples of carbon revenue recycling directed specifically at structural renovation for vulnerable households remain limited, precisely because the approach is relatively new and technically demanding. It requires reliable building data, a skilled construction workforce, citizen engagement and significant institutional preparation. The potential for lasting impact is substantial, however, and merits the groundwork needed. Effective revenue recycling demands creativity from national policymakers, interdepartmental collaboration and a solid understanding of how to apply the EPBD and SCF requirements within the national context to benefit from EU funds and improve the lives of people living in energy poverty and low-performance buildings.

The cases are presented here as a learning portfolio rather than a blueprint. Some demonstrate how to govern revenue recycling, how structural investment can be delivered at scale, or what happens without either. They are organised under two headings: 1) those demonstrating governance and financial recycling design, and 2) those demonstrating structural investment delivery.



5.1. Cases demonstrating governance and financial recycling design

Ireland (2010-now): Carbon tax recycling through the welfare state

Type of mechanism: Targeted income transfer and structural renovation grant, linked through shared eligibility criteria

Ireland introduced a carbon tax in 2010 at €15 per tonne of CO₂, rising to €20/t in 2012, where it remained flat for eight years. During this period revenues flowed into the general budget with no dedicated social or climate purpose. The Finance Act 2020 changed both of these features: it legislated an annual escalator of €7.50/t CO₂ toward a statutory target of €100/t CO₂ by 2030, and it ring-fenced all revenues above the original €20/t CO₂ baseline by law, committing them to three areas: 1) social welfare and fuel poverty prevention, 2) a national retrofitting programme, and 3) agricultural sustainability and just transition measures. Approximately €1.36 billion had been ring-fenced under this mechanism by 2024, with a further €788 million forecast for that year alone.³⁶

The ring-fenced revenues for social welfare and retrofitting flow into two pre-existing instruments rather than new ones. The Fuel Allowance, a weekly winter heating payment awarded to households whose income and savings fall below a set threshold, has existed since 1988. It is administered through the Department of Social Protection using established welfare registers and reaches approximately 400,000 households on qualifying long-term social welfare payments.³⁷ The Warmer Homes Scheme, introduced in 2000 and administered by the Sustainable Energy Authority of Ireland, provides fully free home energy upgrades to households on qualifying social welfare payments and eligibility for the Fuel Allowance is itself one of the qualifying criteria. This link is a deliberate design feature: the same household receiving short-term heating cost relief is automatically in scope for the structural intervention that addresses the underlying problem. By end of 2024, the government had invested €1.2 billion in energy upgrades across 186,000 homes through all Sustainable Energy Authority of Ireland schemes, with half of all expenditure directed to households at risk of energy poverty. Residential upgrades in 2024 alone delivered 146 GWh in energy savings and 68,000 tonnes of CO₂ savings.³⁸ An evaluation of the Warmth and Wellbeing pilot scheme, which targeted people above 55 with chronic respiratory conditions in Dublin from 2016 to 2020, found that it resulted in self-reported health improvements and reductions in drug prescriptions and use of health service contracts.³⁹

³⁶ <https://www.oireachtas.ie/en/press-centre/news-and-features/20240326-climate-focus-on-the-carbon-tax/>

³⁷ <https://www.moneyguideireland.com/claiming-winter-fuel-allowance.html>

³⁸ <https://sustainabilityonline.net/news/ireland-exceeded-home-energy-upgrade-targets-in-2024/>

³⁹ <https://oem.bmj.com/content/82/5/253.abstract>



Key lesson

The flat period from 2012 to 2020 shows that a carbon tax without a rising trajectory and without ring-fencing has limited environmental impact and social purpose. Both elements were needed together. Routing ring-fenced revenues through pre-existing welfare and retrofit infrastructure, rather than creating new delivery systems, reduced administrative costs and avoided the institutional lag that new structures typically encounter. The sequential link between the Fuel Allowance and the Warmer Homes Scheme offers a promising model for Social Climate Plan design. A single eligibility determination gives a vulnerable household access to both immediate income support and long-term structural investment.

Austria (2022-2024): Klimabonus (climate bonus)

Type of mechanism: Universal per capita carbon dividend

Austria introduced a national carbon tax in October 2022 at €30/t CO₂ as part of an eco-social tax reform, with a planned trajectory rising to €55/t by 2025. The revenue recycling mechanism was the Klimabonus, a universal per capita dividend paid automatically to all residents with a primary Austrian address for at least six months in a given year, without any application requirement.⁴⁰ The amount was staggered across four regional categories based on urban density and public transport quality. Children received half the adult amount. The mechanism was explicitly designed to be fully visible: this means revenues were returned to 100% of the population, and the government actively communicated the link between the carbon price and the household payment.

Research modelling the distributional effects of Austria's CO₂ pricing scheme found that uncompensated carbon pricing had nearly twice the negative welfare impacts on fuel-poor households as on the average household, with rural households particularly affected due to higher car dependency and greater prevalence of oil heating systems. All compensation schemes examined, including a flat-rate dividend similar to the Klimabonus, reduce inequality and improve overall welfare compared to uncompensated carbon pricing. However, the study also found that compensation schemes carry a risk of dampening the price signal that would otherwise encourage fuel switching and energy savings, a finding the authors note is relevant when designing accompanying structural measures.⁴¹ A separate analysis of Austria's broader energy crisis support measures found that broad, untargeted compensation measures have limited social impact and impede price signals that would otherwise incentivise energy savings. It concluded that such measures should be replaced in the medium term by targeted income support combined with structural renovation investment.⁴²

⁴⁰ <https://www.klimabonus.gv.at/en/>

⁴¹ <https://www.sciencedirect.com/science/article/pii/S2666278725000042>

⁴² https://www.researchgate.net/publication/388217148_Support_measures_for_Austrian_households_in_the_energy_crisis_an_analysis_of_social_effectiveness_and_implications_for_energy_efficiency



Following the 2024 federal elections, the incoming coalition government discontinued the carbon tax trajectory and ended the Klimabonus. The official Klimabonus website confirms the programme was limited to the years 2022 to 2024. The Austrian case illustrates what happens when a recycling mechanism rests on a political commitment rather than a statutory lock-in. It is vulnerable to reversal when governments change. It also illustrates a design limitation of universal flat-rate dividends: while politically visible, the Klimabonus was not targeted at structural renovation and did not address the underlying causes of energy poverty.



Key lesson

Political commitment to revenue recycling is a necessary starting point, but it is not sufficient to guarantee durability. The Austrian case demonstrates that recycling mechanisms that rest on governmental policy decisions rather than binding legislative frameworks are vulnerable to reversal when political conditions change. Statutory protection, such as embedding revenue recycling obligations in national law rather than relying on budget decisions or coalition agreements, can transform a political commitment into an enforceable and durable guarantee. This distinction is directly relevant to Social Climate Plan design as Member States are encouraged to complement their SCF commitments with national legislative earmarks for domestic ETS2 revenues.

British Columbia (2008-2025): Climate Action Tax Credit

Type of mechanism: Revenue-neutral carbon tax with targeted financial transfer

British Columbia introduced a carbon tax in July 2008 at CA\$10/t CO₂, rising progressively over time. The tax was designed from the outset to be revenue-neutral, with all revenues returned to taxpayers through reductions in personal and corporate income taxes. This statutory requirement was enforced through an annual revenue neutrality plan tabled by the finance minister in the legislature, making it legally binding rather than a political commitment.⁴³

The targeted recycling mechanism for lower-income households was the Climate Action Tax Credit, introduced simultaneously with the tax in July 2008. This is a refundable quarterly payment delivered automatically through the existing tax administration system alongside the federal GST/HST credit system, without requiring a separate application. By 2023, the credit had reached CA\$447 per adult annually, rising to CA\$504 per adult from July 2024.⁴⁴

⁴³ <https://www.sciencedirect.com/science/article/abs/pii/S0301421515300550>

⁴⁴ <https://www2.gov.bc.ca/gov/content/taxes/income-taxes/personal/credits/climate-action>



British Columbia eliminated its carbon tax in 2025, and the Climate Action Tax Credit was cancelled accordingly. The case therefore illustrates both the strengths of statutory revenue recycling design and the limits of subnational carbon pricing in the absence of a national framework.

An important design limitation is that the British Columbia model did not include investment in building renovation; recycling was financial rather than structural. This is precisely the gap that the SCF's prioritisation of renovation investment addresses.



Key lesson

Automatic delivery through an existing tax system without a separate application is an efficient route to low-income households. Statutory revenue neutrality built public credibility in ways a political commitment alone would not have. The subsequent elimination of the tax also illustrates the vulnerability of subnational carbon pricing without a broader national or supranational framework.

Chile (2017-now): Carbon tax without dedicated recycling mechanism

Type of mechanism: Carbon tax with no revenue recycling (counter example)CZ

Chile introduced a carbon tax in 2017 on stationary sources, such as thermal power plants and industrial facilities with a heat capacity above 50 MW, at US\$5/t CO₂. Revenues flow into the general government budget with no statutory mechanism allocating them to vulnerable households or structural investment. This rate is low by international standards. An IMF technical assistance report found Chile's carbon tax of US\$5/t CO₂ to be significantly below the estimated social cost of carbon of US\$32.50/t and recommended that proceeds from any strengthened carbon price be recycled through targeted transfers to vulnerable households as a precondition for an equitable and effective reform.⁴⁵



Key lesson

A low carbon price without a recycling mechanism produces neither environmental nor social outcomes. The IMF recommendation for Chile reflects the same logic underpinning the SCF. A dedicated, statutorily protected allocation to vulnerable households is a precondition for a carbon pricing instrument to be both effective and equitable.

⁴⁵ <https://www.imf.org/-/media/files/publications/cr/2023/english/1chlea2023001.pdf>



5.2. Cases demonstrating structural investments at scale

Denmark (1992-now): CO₂-afgift (carbon tax)

Type of mechanism: Carbon tax with revenues absorbed into general budget

Denmark has operated energy and carbon taxes since the early 1990s. A 2022 cross-party agreement introduced the Green Tax Reform, a CO₂ tax reform, setting a trajectory for firms in the energy and industry sector not covered by the EU ETS with carbon prices to reach 750DDK (approximately €100) per tonne of CO₂⁴⁶ by 2030. It aims to reduce Denmark's CO₂ emissions by 4.3 million tonnes by 2030.⁴⁷ The tax reform also established a Green Fund worth €7.2 billion (around 2% of GDP) to support the broader green transition, including offshore wind and CO₂ capture and storage, from 2024 to 2040.⁴⁸ Household compensation under the 2022 reform operates through electricity tax reductions rather than direct transfers or renovation grants. Model simulations by the government's expert group found that a reduction in electricity tax benefits lower-income households disproportionately, since they spend a higher share of their income on electricity relative to higher-income households.⁴⁹



Key lesson

Denmark illustrates how carbon pricing can be paired with broad green investment and household compensation through the tax system, but it also shows the limits of this approach for renovation policy: electricity tax reductions can ease energy costs but do not directly finance structural improvements in vulnerable households' homes.

⁴⁶ In 2022 prices

⁴⁷ <https://investindk.com/insights/denmark-expands-renewable-energy-and-co2-tax/>

⁴⁸ https://www.oecd.org/en/publications/oecd-economic-surveys-denmark-2026_3d6cb4b8-en/full-report/denmark-s-pathway-towards-net-zero-and-climate-resilience_83b6ebc7.html

⁴⁹ <https://www.cepweb.org/denmarks-green-tax-reform-g20-countries-should-take-notice/>



Switzerland (2008-now): Gebäudeprogramm (buildings programme)

Type of mechanism: Split model using universal per capita dividend plus dedicated structural investment fund

Switzerland has levied a CO₂ charge on fossil heating fuels (e.g. for heating oil, natural gas and coal) since 2008, reaching CHF 120/t CO₂ in 2022. The levy does not apply to motor fuels, which were excluded for political reasons.⁵⁰

Revenue is divided by statute into two channels under the CO₂ Act. Two-thirds is redistributed equally to all residents and businesses as a per capita dividend paid through reductions in health insurance premiums, making the redistribution universally visible without a separate application. One-third is directed to building decarbonisation, with a maximum of CHF 450 million per year allocated to the Gebäudeprogramm alongside promotion of geothermal energy. Unused funds are redistributed to the economy and population.⁵¹

The Gebäudeprogramm, in operation since 2010, funds thermal insulation of building envelopes, replacement of fossil heating systems with renewable alternatives, and optimisation of building technology. It is jointly implemented by the federal government and the cantons, with cantons responsible for delivery. Since its launch, the programme has disbursed approximately CHF 4.1 billion in subsidies, avoiding an estimated 27 million tonnes of CO₂ over the lifetime of supported measures.⁵²

The Gebäudeprogramm does not specifically target vulnerable households. Subsidies are open to all building owners with capacity to co-invest. Its renovation support has therefore primarily reached owner-occupiers, not the energy-poor households that the SCF is designed to prioritise. Research on EU building renovation programmes more broadly confirms that where structural investment is not explicitly targeted, it tends to reach higher-income owner-occupiers rather than the households most affected by energy poverty.⁵³ The Swiss case illustrates this pattern.



Key lesson

Splitting revenues between visible, universal redistribution and dedicated structural investment addresses two distinct objectives simultaneously. The Swiss model shows these need not compete. However, the Gebäudeprogramm's lack of social targeting is a design gap that the SCF framework explicitly corrects by requiring measures to prioritise vulnerable households, making the EU approach more redistributive by design than the Swiss precedent.

⁵⁰ <https://www.bafu.admin.ch/en/funding-in-the-building-sector>

⁵¹ <https://www.bafu.admin.ch/en/funding-in-the-building-sector>

⁵² <https://opendata.swiss/de/dataset/gebaeudeprogramm-jahresbericht-und-jahresstatistik>

⁵³ <https://www.bruegel.org/policy-brief/how-finance-european-unions-building-decarbonisation-plan>



Germany (2021-now): Nationales Emissionshandelssystem (National Emissions Trading System)

Type of mechanism: National carbon pricing with revenues channelled into a broad climate fund; structural renovation investment through income-graduated grants, without a direct statutory link between carbon revenues and household support

Germany introduced a national emissions trading system in January 2021, the Nationales Emissionshandelssystem (nEHS), established under the Brennstoffemissionshandelsgesetz (BEHG, Fuel Emissions Trading Act). The nEHS applies an upstream carbon price to fossil heating fuels and transport fuels not already covered by the EU ETS, making Germany one of the first EU Member States to extend carbon pricing to the buildings and road transport sectors in advance of ETS2. The price was set at €25/t CO₂ in 2021 and rose to €55/t by 2025, transitioning to an auctioning system from 2026 within a price corridor of €55–65/t.⁵⁴

All revenues flow into the Klima- und Transformationsfonds (KTF, Climate and Transformation Fund). Combined revenues from the EU ETS and the nEHS reached €18.5 billion in 2024, of which €13 billion came from the nEHS alone.⁵⁵ The KTF remains active in 2026 with €37.4 billion in planned expenditure, further strengthened by an additional €10 billion per year from Germany's new €500 billion infrastructure special fund.⁵⁶ However, following a constitutional court ruling in late 2023 that declared a budget manoeuvre unconstitutional and triggered a severe budget crisis, the scope of the KTF was significantly revised and several planned programmes were reduced or discontinued.⁵⁷

Revenues are not ring-fenced by statute for specific household support. A universal per capita carbon dividend, the climate bonus ("Klimageld"), promised in the 2021 coalition agreement, was never implemented due to the budget crisis, leaving Germany without a direct, individually visible recycling benefit for households.

The principal structural instrument is the Bundesförderung für effiziente Gebäude (BEG, Federal Support for Efficient Buildings), administered by KfW and the Federal Office for Economic Affairs (BAFA). The BEG provides grants and low-interest loans for heating system replacement and building renovation. From 2024, an income-graduated Einkommensbonus has provided additional grant support to lower-income owner-occupiers. Under the July 2026 BEG reform, this was made more graduated: households with taxable income below €30,000 receive a 40% income bonus on top of the 30% base grant, bringing the maximum total to 70% of eligible costs; those below €40,000 receive an additional 30% and those below €50,000 receive 10%.⁵⁸ From Q1 2027, an existing bonus for worst-performing buildings, which was previously available only for comprehensive whole-building renovation via KfW, will be extended to individual insulation measures on the building envelope via BAFA, adding a further 5% grant for the least energy efficient buildings.⁵⁹

⁵⁴ <https://icapcarbonaction.com/en/ets/german-national-emissions-trading-system>

⁵⁵ <https://www.umweltbundesamt.de/en/press/pressinformation/revenue-from-emissions-trading-once-again-at-record>

⁵⁶ https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Oeffentliche_Finanzen/SVIK/KTF/klima-und-transformationsfonds.html

⁵⁷ <https://www.cleanenergywire.org/factsheets/germanys-planned-carbon-pricing-system-transport-and-buildings>

⁵⁸ <https://www.energiewechsel.de/KAENEF/Redaktion/DE/Meldungen/2026/20260709-neue-gebaeudefoerderung.html>

⁵⁹ <https://www.energiewechsel.de/KAENEF/Redaktion/DE/FAQ/FAQ-Uebersicht/BEG/faq-beg-00-03-03.html>



Key lesson

Germany demonstrates that large-scale carbon pricing revenues can be generated and directed to structural renovation investment. However, the absence of a visible, individually named recycling benefit creates a political vulnerability, as shown by the sustained public debate around the unimplemented Klimageld and repeated calls by the federal Environment Agency for a direct household payment. The progressive redesign of BEG in 2026, which introduced income-graduated grants and a worst-performing-buildings bonus, is directly relevant to Social Climate Plan design. It shows that renovation programmes can be redesigned over time to better target lower-income households and worst-performing buildings. The constitutional court crisis and the Klimageld failure also illustrate the Austrian lesson from a different direction, that recycling commitments that are not legally protected are vulnerable to reversal when political and fiscal conditions change.



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6. A political case for a socially just ETS2

Revenue recycling is not a supplement to carbon pricing but its social and political foundation. How revenues are governed, targeted and made visible to the households bearing the cost of the carbon price will determine whether ETS2 generates the political durability it needs to succeed.

The cases reviewed in Chapter 5 do not offer a single transferable blueprint but demonstrate what has already been experimented with. None of them fully embraces statutory ring-fencing, explicit targeting of vulnerable households or mandatory prioritisation of building renovation. The SCF is, in design terms, more ambitious than any of the international precedents examined. What the cases do offer are lessons on governance durability (Ireland, Austria), the limits of financial-only recycling (British Columbia), the risks of structural investment without social targeting (Switzerland), and the value of income-graduated renovation subsidies as a partial, working form of targeting even where broader rebate schemes stall (Germany). These lessons inform the recommendations in section 6.2.

This chapter first addresses the most common objections to ETS2 and the SCF, since these shape the political conditions in which Social Climate Plans will be designed. It then translates the evidence into concrete recommendations for Member States.



6.1. Common myths

Myth: Carbon pricing inevitably harms the poor

The outcome depends entirely on how the government manages and uses the revenue. Without recycling, carbon taxes are regressive: the cost falls disproportionately on lower-income households who spend a higher share of their income on energy.⁶⁰ With well-designed revenue recycling targeted at low-income households, the net effect can be progressive. This means the poorest households end up better off, not worse. A CGE modelling study of British Columbia found that the carbon tax burden fell more heavily on higher-income households even before recycling was taken into account, and that the accompanying Climate Action Tax Credit made the overall policy progressive.⁶¹ A multi-country modelling study confirms that combining a carbon price with lump-sum or targeted transfers systematically outperforms tax cuts in distributional terms across a wide range of national contexts.⁶² Modelling of ETS2 specifically finds that without compensatory measures, welfare losses fall disproportionately on lower-income households; with revenue recycling through lump-sum transfers, these losses are reversed.⁶³

Myth: The revenue from ETS2 will never reach the people who need it

Complexity in policy design is not evidence of ineffectiveness, but it does reflect the seriousness of the challenge being addressed. The key determinant of whether SCF funds reach vulnerable households is the quality of Member States' Social Climate Plans – how precisely they identify worst-performing buildings and vulnerable households, and how well they match delivery mechanisms to different household needs. Ireland's experience demonstrates that routing revenues through existing welfare infrastructure achieves both administrative simplicity and good targeting at scale without building new systems. The key is institutional readiness and deliberate design rather than avoidance of complexity.

60 <https://www.sciencedirect.com/science/article/abs/pii/S092180091831084X>

61 https://econpapers.repec.org/article/eeeresene/v_3a41_3ay_3a2015_3ai_3ac_3ap_3a40-69.htm

62 <https://www.nature.com/articles/s41558-018-0201-2>

63 <https://www.chaireeconomieduclimat.org/en/publications-en/carbon-price-is-in-the-house-short-run-effects-of-the-eu-ets2/>



Myth: ETS2 should be abandoned to protect vulnerable households

Abandoning ETS2 would remove both the carbon price signal needed to drive decarbonisation and the revenue stream behind the SCF, which is designed specifically to protect vulnerable households. Without carbon pricing and ETS2, fossil fuel use in buildings and transport will continue unchecked, and energy poverty will be exacerbated as fossil fuel price volatility persists and the revenues needed to fund renovation and income support do not materialise. As Carbon Market Watch notes, scrapping ETS2 would not end energy poverty but would remove the tools to address its structural causes.⁶⁴ Research modelling EU climate policy scenarios has found that proposals not accompanied by revenue recycling risk increasing the number of households in energy poverty, while income-targeted recycling schemes can lift over one million households out of energy poverty.⁶⁵ The SCF is explicitly designed to support vulnerable households and its discontinuation would remove the primary EU-level mechanism for doing so.

Myth: Revenue recycling is a transfer payment that doesn't address the root problem

This objection applies to income transfers but not to the SCF as designed. The SCF Regulation (EU) 2023/955 explicitly prioritises structural investment over temporary income support, which is permitted only as a supplementary and transitional measure. A comparative modelling study in the UK found that direct energy bill support provides immediate but short-lived relief, while public investment in building retrofits generates a sustained reduction in energy costs over time that financial transfers alone cannot replicate.⁶⁶

⁶⁴ <https://carbonmarketwatch.org/2025/01/24/u-turn-on-eus-emissions-trading-system-for-road-transport-and-buildings-carries-huge-environmental-social-and-economic-price-tag/>

⁶⁵ <https://pmc.ncbi.nlm.nih.gov/articles/PMC10102115/>

⁶⁶ <https://www.sciencedirect.com/science/article/pii/S2214629626000599>



Myth: Carbon pricing and ETS2 will make European industry uncompetitive and drive jobs and production abroad

ETS2 covers buildings and road transport but not industrial production, which remains under EU ETS with its own set of competitiveness safeguards including free allocation and the Carbon Border Adjustment Mechanism (CBAM). Concerns around competitiveness are legitimate in the EU ETS context and have been taken seriously in EU policy design. However, these concerns are largely invalid in the case of ETS2, which regulates fuel suppliers, not manufacturers. The businesses most directly affected by ETS2 are those occupying poorly insulated buildings with high heating costs. SCF-funded renovation support reduces those costs permanently, improving rather than harming their long-term competitive position. Additionally, increased renovation activity stimulates demand in the construction sector, supporting employment and economic activity. The European Commission estimates that achieving the renovation ambitions of the EPBD could create up to 160,000 additional jobs in construction and renovation by 2030.⁶⁷

6.2. Recommendations for designing effective Social Climate Plans

The good practice cases reviewed in this report give an idea of existing design features and the factors that distinguish effective revenue recycling from well-intentioned but poorly delivered programmes. Drawing from the literature and practical evidence reviewed above, the following recommendations aim to support Member States in preparing and implementing their Social Climate Plans, with specific reference to what the SCF Regulation, the EPBD recast and the EED require and enable. The goal is to inspire Member States to be ambitious and systemic in designing their Social Climate Plans and take the unprecedented opportunity ETS2 creates to make carbon pricing work for the people it is most often accused of harming.

6.2.1. Identify vulnerable households and worst-performing buildings

The foundation of effective Social Climate Plans and revenue recycling is to identify vulnerable households and the buildings in which they live with sufficient precision to enable targeted delivery. The SCF's requirement to identify and target vulnerable households is also, for Member States that treat it seriously, an investment in a shared data infrastructure with policy returns well beyond the SCF itself, as argued in Chapter 4.

⁶⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0662>



Map worst-performing buildings and vulnerable households at local level	Integrate EPC data, energy poverty indicators (drawing on the EED Art. 22 definition) and social protection registers at municipal or local level. Prioritise the intersection of worst-performing buildings and low-income households. Countries with existing cadastral or building stock data-bases, including Hungary, Poland and Romania, should use these as a starting point rather than building new systems from scratch.
Use EED definitions as a targeting basis	Article 22 of the Energy Efficiency Directive provides definitions of energy poverty and vulnerable customers that can anchor the identification methodology in Social Climate Plans, ensuring consistency across Member States and with Commission assessment criteria.
Invest in shared identification infrastructure and use Social Climate Plan data mapping to serve multiple policy goals	The spatial and social data that Member States must build to implement their Social Climate Plans (e.g. integrating EPC registers, energy poverty indicators and social protection data at local level) is equally valuable for national building renovation plan delivery, cohesion policy targeting, public health investment and climate resilience planning. Member States that invest in this data foundation will generate policy returns across multiple budgets from a single identification exercise. This is among the strongest practical arguments for treating Social Climate Plan preparation as a strategic investment rather than a compliance obligation.
Develop a household segmentation logic	Not all vulnerable households have the same needs or the same capacity to participate in renovation programmes. Social Climate Plans should distinguish between households requiring full grant coverage with administrative support (most vulnerable), those who can co-finance with support (moderately vulnerable) and those who need only facilitated access to finance. The delivery mechanism should be matched to the segment.

6.2.2. Choose delivery mechanisms to reach the most vulnerable

The choice of delivery mechanism determines who is actually reached. Most vulnerable households are systematically underserved by mechanisms that require initiative, administrative capacity or upfront financial commitment. The Swiss Gebäudeprogramm (open to all building owners) has primarily reached those with capacity to co-invest. Structural programmes without social targeting replicate and sometimes worsen the inequalities they are designed to address.⁶⁸ The absence of a dedicated social targeting dimension is precisely the gap that the SCF corrects by design.

⁶⁸ <https://www.bruegel.org/policy-brief/how-finance-european-unions-building-decarbonisation-plan>



Prioritise full grants with no repayment obligation for the most vulnerable	For households in deepest energy poverty, full grants with no repayment obligation are the only mechanism likely to reach them. Loan-based instruments should be positioned as supplementary tools for households with some financial capacity, not as the primary vehicle for SCF delivery to the most vulnerable.
Establish one-stop shops at municipal level	One-stop shops, delivery mechanisms identified by the EPBD and EED, can help reach vulnerable households in renovation programmes. They require upfront investment but significantly increase uptake and reduce per-renovation transaction costs. Social Climate Plans should include a framework for establishing one-stop shops, drawing on EPBD Article 17, which encourages Member States to provide technical assistance through such facilities.
Address the landlord-tenant split incentive directly	The private rented sector deserves particular attention in Social Climate Plans, as it houses a disproportionate share of energy-poor households across Europe. Where Member States choose to extend MEPS to residential buildings under EPBD Article 9, SCF-funded renovation grants or interest-free loans to small landlords should come with conditions. These should include renovation to a specified EPC level, no post-renovation rent increase for a defined period, and notifying and obtaining consent from tenants. In multi-family buildings managed by residents' associations and housing cooperatives, renovation requires agreement among residents who often lack the funds to contribute and are unwilling to take on shared loans. EPBD Article 17 (5) already allows Member States to remove unanimity requirements in co-ownership structures and to make these structures direct recipients of financial support; climate plans should actively draw on this provision.
Prioritise structural investment over income support	The SCF Regulation requires Member States to include structural measures as the primary content of their Social Climate Plans, while permitting temporary direct income support as a supplementary measure capped at 37.5% of total plan expenditure and required to decrease over time (Art. 4(3), Regulation (EU) 2023/955). Recital 40 reinforces this and states income support should be granted in conjunction with structural measures, not as a standalone substitute. Social Climate Plans should reflect this logic in their design. Where income support is included, plans should define explicitly the population it serves and the timeline within which structural investment is expected to replace it.



A note on what the cases did not show. While Germany has established a well-developed model for delivering structural renovation investment, differentiated by income level, none of the cases reviewed demonstrates a mechanism specifically for channelling carbon revenues through municipal authorities. This gap in the evidence base is itself a lesson. The SCF creates a new opportunity for municipalities to act as implementing bodies for structural renovation investment, but the institutional models for doing so remain underdeveloped. Member States designing their Social Climate Plans should treat this as an area requiring deliberate institutional design rather than assuming existing models will suffice.

6.2.3. Securing institutional and legal frameworks

The Austrian Klimabonus is the clearest illustration in this report of what happens when revenue recycling rests on political commitment rather than statutory protection. The Klimabonus was discontinued within two years of its introduction following a change of government. The Irish model, where revenues above the original €20/t baseline are ring-fenced by statute through the Finance Act, has survived multiple electoral cycles and a major energy price crisis precisely because the commitment is legally binding and less politically negotiable.

Social Climate Plans, once accepted by the European Commission, create a degree of EU-level institutional lock-in. But this needs to be complemented by national legislative frameworks that make reversal politically and legally costly.

Enact national legislative earmarks	Enact national legislation to ring-fence domestic ETS2 revenues for climate-social uses such renovation support, energy poverty alleviation and household transition. The Irish model of a statutory ring-fence is an example.
Embed Social Climate Plans in the national building renovation plan	Ensure that the Social Climate Plan and the national building renovation plan are designed as integrated documents with shared data, shared targeting logic, and shared delivery frameworks rather than parallel administrative exercises. The EPBD Article 3 NBRP financing roadmap should explicitly reference SCF funding streams and Social Climate Plan instruments.



6.2.4. Making revenue recycling visible

A recycling mechanism that works but is invisible will not generate the political durability that ETS2 requires. A systematic review of 48 studies on carbon pricing acceptability found that environmental earmarking is the preferred revenue recycling option across the public, and that trust, communication and salience of the recycling mechanism are key factors in sustaining acceptability.⁶⁹ A meta-analysis of 70 surveys across 26 countries found that the introduction of any form of revenue recycling increases public support for carbon pricing, with the strongest effects observed when recycling is perceived as fair and directed at vulnerable groups.⁷⁰

The cases confirm this: for example, British Columbia’s quarterly tax credit statements made the recycling benefit personally visible and individually named. Ireland’s statutory communications explicitly link carbon revenues to the Fuel Allowance and Warmer Homes Scheme. Switzerland’s per capita dividend, visible on health insurance documents, also reaches residents.

Treat public communication as a policy instrument	Design SCF delivery schemes to be individually visible to beneficiaries such as citizens and businesses. This means named benefit statements, clear attribution on grant decision letters, and public reporting on how SCF funds have been used and who has benefited. Communication of the recycling link should be built into the administrative design of delivery.
Report outcomes, not only expenditure	Social Climate Plans should include rigorous monitoring and evaluation frameworks tracking outcomes (e.g. EPC improvements per dwelling, energy bill reductions, households exited from energy poverty), not only expenditure against budget lines. This evidence base is needed both for Commission reporting and for building public understanding of what the mechanism delivers.

69 <https://www.tandfonline.com/doi/full/10.1080/14693062.2024.2376747>

70 <https://www.nature.com/articles/s44168-024-00153-x>



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7. Outlook

When revenues are recycled visibly and in ways that households can connect to their own bills and heating costs, public support is more likely to hold over time. Where recycling is absent or politically reversible, support tends to collapse or be entirely absent, as was the case in France in 2018. Germany illustrates the same dynamic from the other direction, where a household rebate (“Klimageld”) was written into the 2021 coalition agreement, yet has never been paid out.

None of the cases in this report provides a model of what works at scale: most are too nationally specific, too recent or insufficiently evaluated at household level to draw strong outcome conclusions. Instead, they show possible design features that may (or may not) be effective. Together with existing literature, they point to several preconditions for good revenue recycling: statutory protection of revenues, delivery through institutions that already have reach into vulnerable households, and a benefit that is clearly visible to individuals rather than abstract.

For a national ministry preparing a Social Climate Plan, this may feel like a considerable investment of political and administrative capital for an instrument that does not yet exist in practice. Yet there are significant practical benefits. A well-designed Social Climate Plan is not primarily a reporting obligation to the European Commission, but rather the instrument through which a Member State protects itself from the political dynamics that have derailed carbon pricing elsewhere. A government that can point to a statutory ring-fence, a visible household benefit and a measurable reduction in energy bills for its most vulnerable voters has a fundamentally different proposition from one that cannot.

⁷¹ <https://www.tandfonline.com/doi/full/10.1080/00343404.2020.1826040>



The SCF does not ask Member States to fully fund the transition from their own budgets, but limits country contributions to 25%. The SCF will provide a major source of revenue for many countries: Poland, for example, will receive more than €15.3 billion including co-financing. The SCF provides revenues generated by carbon pricing and asks Member States to design the mechanism through which those revenues flow back to their own most vulnerable households, with a matching national contribution. This is, in substance, what Member States do with cohesion funds. The difference is that the Social Climate Plan creates an obligation to target the most vulnerable, which most cohesion spending historically has not done well. Research analysing EU structural fund investment across 63,000 electoral districts has found that cohesion investment is associated with lower Eurosceptic vote shares only where it generates tangible improvements in people's daily lives.⁷¹ A household in a renovated building with not only a lower heating bill but also significantly improved thermal comfort, noise reduction and protection from extreme heat has experienced exactly that kind of tangible improvement.

The identification work that Social Climate Plans require also serves purposes beyond the SCF. Mapping worst-performing buildings, locating vulnerable households, and integrating energy performance data with social protection registers, housing affordability indicators and local health data creates an evidence base that serves national building renovation plan delivery, cohesion fund targeting and housing policy simultaneously. Member States that invest in this mapping exercise carefully will find that it reduces rather than adds to the administrative burden across multiple EU obligations.

The question for each Member State is whether to treat its Social Climate Plan as a compliance exercise that unlocks funding, or as a strategic tool that builds the political and institutional foundations for a durable energy transition and an investment into the resilience of the country.

⁷¹ <https://www.tandfonline.com/doi/full/10.1080/00343404.2020.1826040>

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