

A STUDY OF SUPPORTING MEASURES PROMOTING DECARBONISATION IN THE SECTORS COVERED BY ETS2

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A STUDY OF SUPPORTING MEASURES PROMOTING DECARBONISATION IN THE SECTORS COVERED BY ETS2

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EXECUTIVE SUMMARY

In 2027, the EU Emissions Trading System 2 (ETS2) will become fully operational. ETS2 is a new, separate EU ETS to cover sectors where progress on decarbonisation has historically been limited, namely road transport, buildings, and additional sectors (mainly industry not covered by ETS1).

ETS2 is not an isolated policy but part of a broader policy mix of national and EU-wide measures designed to accelerate decarbonisation and support the EU's climate targets: a 55% reduction in greenhouse gas emissions by 2030 compared to 1990 levels, and climate neutrality by 2050. In the sectors covered by ETS2, the EU has already enacted key complementary legislation, including the Alternative Fuels Infrastructure Regulation (AFIR), the CO₂ emission performance standards for new passenger cars and for new light commercial vehicles, the Energy Efficiency Directive (EED), and the Energy Performance of Buildings Directive (EPBD). These initiatives share a common approach: the use of legally binding targets, mandatory performance requirements, and enhanced transparency and communication for end users. The Commission's impact assessment showed, however, that reliance on strengthened regulatory policies alone would not be sufficient to achieve the targets and would lead to higher burdens on households and more significant investment challenges. ETS2 is therefore embedded in this policy mix to ensure the most cost-effective approach.

While these regulatory policies promote climate action, the EU recognises the challenges that extending carbon pricing to new sectors may bring for the most vulnerable groups, including households vulnerable to energy poverty, micro-enterprises and vulnerable transport users. To mitigate these impacts and ensure a just and equitable transition, the EU has established the Social Climate Fund (SCF), which will be primarily financed through revenues from ETS2. The SCF will provide Member States with financial support, subject to specific conditions, to implement targeted national measures that support both climate objectives and social equity. In addition, Member States will be required to use all remaining national ETS2 revenues for climate action and social measures, and they will report on how these funds are utilised.

By showcasing best practice measures implemented across the Union, this study aims to support Member States in designing and implementing effective, complementary measures that address key barriers and promote decarbonisation in the initial years of the ETS2. The proposed measures have been selected based on their cost-effectiveness, replicability, scalability, and potential for high short-term impact, through a rigorous, multi-step approach which included: identifying barriers, mapping relevant countermeasures, collecting qualitative and quantitative data on potential best practices, evaluating measures through a rating framework, and consulting with sectoral experts. The table below illustrates the full list of twenty-one measures that were identified through this work.

Table 0-1 Full list of supporting measures

Name of the supporting measure	Category/type of measure
Road transport	
Emission based taxes and tolls (bonus-malus). Tax advantaged for ZEV and malus for ICEV	Financing - Tax incentives
Reduced and simplified ticket pricing for public transport	Regulation & standards
On-demand transport	Regulation & standards
CO ₂ based tax deductibility for company cars	Financing - Tax incentives
Price transparency for public charging	Regulation & standards
Urban transport planning towards modal shift - Superblock model	Regulation & standards
Financial incentives for grid connection of charging infrastructure for heavy-duty vehicles, including grid connection	Financing - grants/subsidies
Streamlining and harmonising administrative processes for grid connections	Regulation & standards

Name of the supporting measure	Category/type of measure
Eurovignette – Truck tolling in favour of ZE HDVs.	Financing – tolling mechanism
Buildings	
Acting to reduce electricity prices for specific technologies (e.g. heat pumps)	Regulation & standards, Financing - Tax incentives
On-bill-financing	Financing - Soft loans/loans
Information about heat pumps and tools	Awareness, technical support and training
State guaranteed and interest-free loans for energy efficiency measures	Financing - Soft loans/loans
Energy efficiency information programmes and tools	Awareness, technical support and training
Subsidies for building renovation	Financing - grants/subsidies, Financing - Soft loans/loans
Tax deductions for energy efficiency renovations and renewable heating systems / VAT reductions	Financing - Tax incentives
Industry	
Financing schemes supporting energy efficiency investment	Financing - grants/subsidies/Soft loans/loans
Voluntary Energy Efficiency Agreements	Voluntary agreements, Financing - grants/subsidies
Energy audits	Awareness, technical support and training
Provision of external support	Awareness, technical support and training
National Investment Funds supporting R&I and demonstration projects	Financing - grants/subsidies

In the road transport sector, most selected measures aim to address concerns around charging infrastructure and the relatively high costs of low-emission vehicles compared to conventional options. As such, the policy mix includes both economic instruments (such as incentive schemes) and regulatory tools (such as standards and requirements). These policies are necessary to promote the electrification of road transport, which is responsible for around three quarters of all transport-related emissions. Additionally, three out of eight measures target modal shift in the shorter term, promoting a transition from a car-centric model to more diverse and sustainable mobility options, including cycling, public transport, and rail. Further modal shift initiatives, such as the expansion or redesign of public transport networks and intermodal hubs, or the development of rail and shared transport infrastructure, should be considered in long-term planning, as they are essential for the sector's full decarbonisation.

In the buildings sector, selected measures primarily address two key barriers: high upfront costs and limited consumer awareness. These are tackled through a combination of economic incentives and information-based instruments, both aimed at enhancing energy efficiency.

For the industry sector, the proposed measures combine financial and technical support with training and capacity-building initiatives, together addressing some of the main challenges faced by smaller firms in the decarbonisation process. In addition, support for innovation is included, targeting both quasi-mature solutions and the early-stage development of emerging technologies.

Alongside these twenty-one measures, three options with significant future potential have been identified, of which two in the buildings sector and one in the road transport sector. The first aims to incentivise both landlords and tenants to pursue energy savings by improving building energy performance and promoting more sustainable behaviours. The second explores the introduction of leasing contracts for heat pumps, removing the initial investment burden for end users and enabling governments to subsidise uptake by lowering end-user costs for households and businesses. The third focuses on a local example of how an investment in urban cycling infrastructure could incentivise modal shift and contribute significantly to the decarbonisation efforts.

While not exhaustive, the list represents a diverse and balanced set of policy instruments that are cost-effective, scalable, and aligned with EU climate goals. The selected measures demonstrate how Member States can make effective use of their resources to deliver targeted decarbonisation outcomes in the early years of ETS2 implementation, with attention to lower income and middle income groups affected by the transition. Member States are encouraged to build on these examples, integrate them into coherent national strategies, and ensure continuity through long-term planning. Policy stability will be essential to enable households, local community groups, local authorities and businesses to plan with confidence, make informed decisions, and invest in the adoption of low-carbon technologies. This approach will be critical to delivering on objectives of climate ambition and just transition at the heart of the European Green Deal.

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1. INTRODUCTION TO THE STUDY

This progress report has been prepared by Ricardo and Oeko-Institut as part of the project “Service contract for ETS2 implementation and analysis”, specific contract No 300100017, implementing framework contract No CLIMA/A4/FWC/2023/0002/RICARDO. The report has been prepared for the Directorate General (DG) Climate Action of the European Commission.

1.1 POLICY CONTEXT

The ETS2 was introduced as part of the 2023 revision of the EU ETS Directive, establishing a distinct carbon market to cover CO₂ emissions from fuel combustion in sectors previously outside the scope of the original ETS1 – specifically, buildings, road transport, and additional sectors (mainly industry not covered by ETS1). These sectors have been selected because the progress in their decarbonisation has not aligned historically with the EU’s decarbonisation goals.¹ To ensure administrative simplicity, compliance obligations under ETS2 will fall on upstream fuel suppliers, who will be responsible for monitoring, reporting, and surrendering allowances for the emissions associated with the fuels they place on the market.

The ETS2 will become fully operational in 2027, with an annually declining emissions cap designed to align with the EU’s 2030 climate targets and eventual climate neutrality by 2050. As the carbon cost will be embedded in fuel prices, the financial burden will be passed on to final consumers – households, drivers, businesses, and public services – altering price signals and incentivising lower carbon choices. However, these price increases risk exacerbating existing inequalities if no complementary policies or options for consumers are put in place.

To mitigate these impacts and provide opportunities to citizens, the EU established the Social Climate Fund (SCF)². The SCF aims to ensure that the transition to climate neutrality is fair and socially inclusive. It will be financed primarily from ETS2 auction revenues, supplemented by the auctioning of 50 million allowances from the existing ETS1. Member States are required to co-finance 25% of the measures funded by the SCF, leveraging total resources of up to EUR 86.7 billion for the period 2026–2032.

To access SCF funding, Member States must prepare Social Climate Plans, which outline the specific measures they intend to implement, such as direct income support (limited in size and time), energy efficiency investments in housing, or access to zero- and low-emission mobility options. These plans must be developed in consultation with stakeholders across civil society, local authorities, and economic actors, and must demonstrate how the proposed actions will benefit the most vulnerable populations. The Commission will assess and approve these plans based on how effectively they target the social impact of ETS2 on vulnerable households, vulnerable micro-enterprises and vulnerable transport users, cost-effectiveness, and alignment with broader climate goals. In addition, Member States will be required to use all national ETS2 revenues for climate action and social measures and will report on how this money is spent. This can include measures to contribute to the decarbonisation of heating and cooling of buildings or to the reduction of the energy needs of buildings, including the integration of renewable energies, measures to accelerate the uptake of zero-emission vehicles or to provide financial support for the deployment of fully interoperable refuelling and recharging infrastructure for zero-emission vehicles, measures to encourage a shift to public transport and improve multimodality, as well as measures to provide financial support for low-income households in worst-performing buildings and for low- and middle-income transport users.

Furthermore, ETS2 will build upon and be embedded in an existing set of EU-wide and national measures aimed at increasing energy efficiency and improving infrastructure in ETS2-related sectors. For instance, at EU-level the Alternative Fuels Infrastructure Regulation (AFIR) sets specific objectives to support the uptake of alternative fuel vehicles across all transport modes and all Member States. The development plan is designed to ensure the interoperability of infrastructure. Moreover, AFIR aims to enhance transparency and clear communication of data, ensuring easier access for consumers to relevant prices and information. Furthermore, the CO₂ emission performance standards for new passenger cars and new light commercial

¹ [EUR-Lex - 52021PC0551 - EN - EUR-Lex](#)

² [Social Climate Fund - European Commission](#)

vehicles require manufacturers to improve current technologies and innovate in zero-emission technologies in order to meet progressively more stringent performance targets.³

The Energy Efficiency Directive⁴ sets binding targets for energy efficiency, to ensure the achievement of a 55% reduction in GHG emissions compared to 1990 levels. EU Member States are required to achieve cumulative end-use energy savings, with increased emphasis on alleviating energy poverty, for example, through instruments such as the Social Climate Fund (SCF). To support energy savings in the buildings sector, which accounts for 40% of total energy consumption in the EU, the Energy Performance of Buildings Directive (EPBD) was enacted.⁵ The EPBD aims to increase the renovation rate across the EU, targeting the worst-performing buildings in each country through the introduction of binding targets and minimum energy performance standards.

Overall, the ETS2, the Social Climate Fund, and other relevant EU and national policies represent a comprehensive approach. Carbon pricing will incentivise emissions reductions in sectors previously untouched by the ETS1. The Social Climate Fund will focus on mitigating the social impacts of the transition through targeted support measures, particularly for households with lower income. Finally, the broader set of EU and national policies and regulations will contribute to delivering emission reductions, by setting clear binding targets and promoting improvements in specific and critical areas, while also providing increased policy stability.

1.2 OBJECTIVES

The overall aim of this study is to identify a list of existing best practice measures, policies and investments available at the national level for EU Member States (MSs) to support rapid decarbonisation in the sectors covered by ETS2, namely: road transport, buildings, and a range of industries not included in the ETS1. The concept of support measures refers to complementary measures that can ensure or increase the effectiveness of other policies. The measures identified in this study focus on addressing specific challenges and barriers to decarbonisation in the ETS2 sectors. Particular attention is given to measures that are **scalable**, **replicable** across other EU Member States, likely to generate immediate, **short-term impacts**, and are sufficiently **cost-effective**. The measures in this study should be seen as contributing to the efforts under the SCF, Member States' use of ETS2 revenues and other EU and national policies and regulations aimed at mitigating the distributional and social impacts of the energy transition. Notably, the selected measures go beyond the scope of the Social Climate Fund, as they also support middle income households by promoting energy efficiency renovations, the uptake of electric vehicles, and other initiatives that facilitate a broader transition.

The scalability of a measure refers to its ability to cover a significant share of emissions within a sector and its potential to be extended to other stakeholders and ETS2 sectors. Replicability is crucial, as best practices must be implementable across different Member States to accelerate decarbonisation by building on existing experience and knowledge. In addition, cost-effectiveness is a key attribute of the selected measures, as the transition will demand substantial resources, which must be allocated and utilised in the most efficient and impactful manner possible.

In principle, the emphasis of this study is on **ready-to-use measures** which can be implemented in the short-term and generate immediate benefits for people and businesses. This is intended to support energy efficiency and decarbonisation during the initial years of ETS2, making good use of ETS2 revenues and easing the transition for consumers and businesses to meet the 42% GHG emission reduction needed for 2030. However, this study also acknowledges that there is a broad range of measures which are essential cornerstones for Member States' decarbonisation strategies that can be initiated in the short-term but may take longer to generate their full impact for people and businesses. This includes measures such as redesigning or expanding public transport networks and hubs, the development of modal shift and rail transport infrastructure, or other public transport services. This study investigates a number of such measures, including fair ticket pricing for public transport and urban planning measures to reduce traffic and pave the way for a modal shift away from cars. Finally, the study also highlights measures that show a good future potential, such as the Carbon Dioxide Act in Germany to combat split incentives between tenants and landlords, leasing of heat pumps and cycling infrastructure as a means to promote modal shift in chapter 3. These types of measures in general are dealt

³ [EUR-Lex - 02019R0631-20250101 - EN - EUR-Lex](#)

⁴ [Directive - 2023/1791 - EN - EUR-Lex](#)

⁵ [Directive - EU - 2024/1275 - EN - EUR-Lex](#)

with more broadly in the guidance on good practices already published by the Commission as part of the support provided to Member States for their Social Climate Plans.⁶ As such, this study complements the other guidance and support published by the Commission.

Each sector covered by ETS2 has its own distinguishing factors and unique challenges when it comes to decarbonisation. In the buildings sector, 30% of the sector is already covered by carbon pricing (notably electric heating, electricity for heat pumps and district heating are covered under ETS1), while ETS2 will directly affect the cost of the remaining share of heating fuels (for example home gas boilers, which are not covered under ETS1), leading to a level playing field for various heating systems, and catalysing investment in cleaner technologies and energy renovations for which payback time will be reduced. In the transport sector, ETS2 will similarly influence vehicle owners by increasing operating costs associated with ownership of diesel and petrol cars. As a result, ETS2 will increase the attractiveness of electric vehicles and car usership schemes, incentivising their uptake, as well as the uptake of and investment public transport, modal shifts or transport on demand.

1.3 REPORT STRUCTURE

The content of this report is organised into three main sections.

Section 1 introduces the study, its objectives and the policy context, also providing a brief overview of the methodological approach that was used to identify both barriers and measures, for each ETS2 sectors. Moreover, Section 1 outlines the process that resulted in the selection of best practices.

Section 2 provides a brief introduction to the case study structure and content, along with a summary of the twenty-one case studies developed. This includes key information such as the challenges addressed, geographical scope, and type of measure.

- **Subsection 2.2** presents the nine case studies developed for the **road transport** sector.
- **Subsection 2.3** includes the seven case studies developed for the **buildings** sector.
- **Subsection 2.4** covers the five case studies developed for the **small industry** sector.

A consistent structure is applied across all case studies, regardless of sector.

Section 3 introduces a selection of **high-potential measures** for the future – these are not classified as best practices within the scope of this study but demonstrate potential for future application. Three of these measures are presented in **Subsections 3.1.1, 3.1.2 and 3.1.3**.

The report is complemented by three annexes:

- **Annex 1** provides an expanded description of the methodological approach outlined in Subsection 1.2. It includes details on how challenges and barriers were identified, how supporting measures were selected, and assessed to identify key best practices.
- **Annex 2** presents a comprehensive list of all measures identified during the project, grouped by subsector.
- **Annex 3** presents 68 tables, each providing summary information on a measure from the long list.

1.4 METHODOLOGY

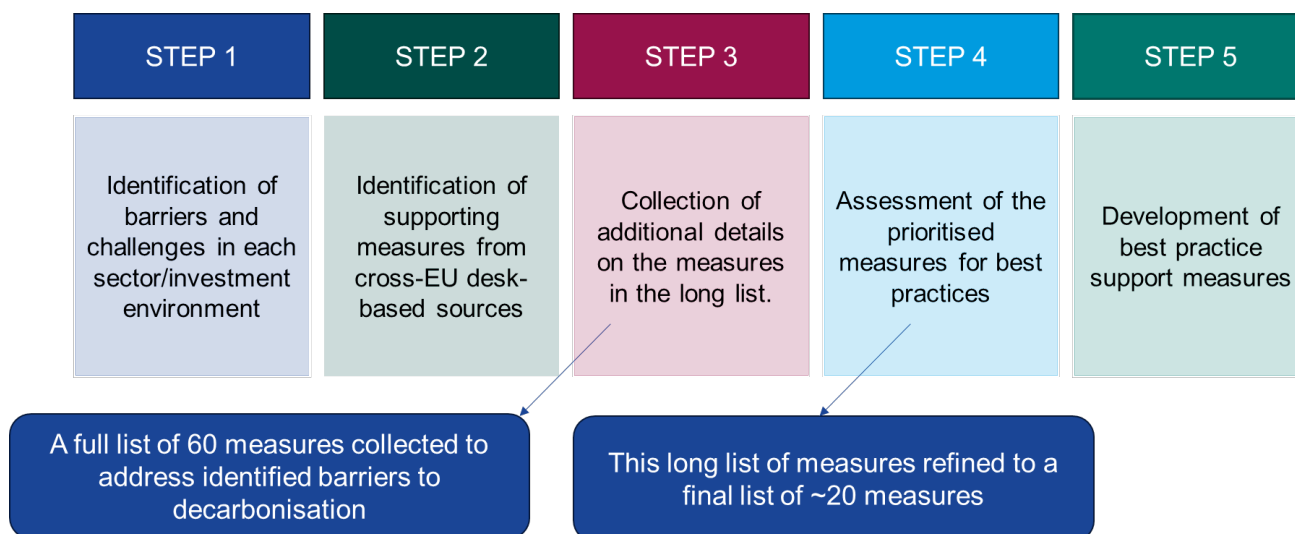
This subsection provides a brief overview of the process taken culminating in the final development of 21 best practice measures to decarbonise ETS2 sectors. A five-step approach was taken as described below. More detail is included in Annex 1 of this report.

- Step 1: Identification of barriers and challenges in each sector/investment environment using systems dynamics maps.
- Step 2: Identification of supporting measures to address the barriers and challenges from cross-EU desk-based sources, which formed the initial long list of measures.
- Step 3: Collection of additional details on the measures included in the long list.
- Step 4: Assessment of the prioritised measures for best practices.

⁶ <https://op.europa.eu/en/publication-detail/-/publication/af68b4c7-3508-11ef-b441-01aa75ed71a1/language-en>

- Step 5: Development of best practice support measures case studies.

Figure 1-1 Methodological steps towards development of best practices



- **Step 1:** The aim of step 1 was to collect a large list of barriers and challenges to the decarbonisation of the sectors covered by ETS2, namely road transport, buildings and small industry. Barriers and challenges were found for each sector. Through desk-based research 82 barriers/challenges were identified and included in the long list (although some are repeated across subsectors) and later discussed with internal sector experts from Ricardo and Oeko-Institut. Based on the research carried out, 31 barriers/challenges were selected from the 82 initially identified.
- **Step 2:** The aim of step 2 was to identify supporting measures to reduce the impact of prioritised challenges/barriers. The measures were collected through desk-based research sources. The aim was to collect up to 2 measures per barrier. In total 66 measures were found; however, some were repeated as they are applicable across different subsectors/sectors and other cases highlighted a different national variation of the same measure (e.g. subsidies/grants for EV purchases with three MS examples). The Odyssee-Mure database was used to identify measures that potentially qualify as best practices.
- **Step 3:** The aim of step 3 was to collect additional details (from diverse sources) on the measures collected in Step 2. The information collected was later used in Step 4 to compare the measures across a range of criteria and consequently refine the list of measures through a ranking process to a final list of 21. The information collected included, affected stakeholders, expected impacts and details affecting implementation and delivery. The list of measures was also sent to the respective Member States that they were associated with, to provide their views on the measures and provide additional information from up-to-date sources.
- **Step 4:** The 21 best practice measures were selected by ranking the long list of measures through a 2-tier approach as well as 3 stakeholder webinars on the 6th of May 2025 (one for each sector). In the first round, measures that were mandated by the EU legislation and had no additional element to them from a national perspective were removed, as well as those with insufficient information to qualify them as best practices. In the second round, the measures were ranked according to the criteria in Table 1-1 below. The top 10 measures for each sector were then taken forward and presented in 3 webinars on the 6th of May 2025 (one for each sector). Member State representatives, departments from the European Commission and key European stakeholders including industry associations and NGOs were invited to share their views on the ranked measures. More details on the webinar outcomes can be found in Annex 1.

Table 1-1 Key ranking criteria for selected measures

Assessment Area	Key indicators
Synergies with other measures/policies	Positive synergies include relationships between policies where one or both measures show amplified positive effects due to the presence of the other policy.
Impact/effectiveness	- Extent to which measure may contribute to addressing needs and barriers in the short-term - Potential emissions savings - Design of the policy, implementation infrastructure, evidence of impact (case study, public acceptance, statistics...)
Scalability (including cost effectiveness)	- Can the policy be applied to numerous stakeholders and across sectors/subsectors - What is the social, public and private cost?
Speed of implementation	Can the measure be implemented in the short term
Replicability (policy context of the Member States)	- Is the policy measure replicable in other MS - Dependency on other measures - Cultural impact/ Geopolitical context/ public acceptance
EU mandated measure	Is a measure already mandated under the EU
Availability/ quality of information	Quality of information available for best practice consideration
Stakeholder input	Inputs from the European Commission, Member States and key stakeholders (interview and webinar)

- **Step 5:** In this step, 21 best practice support measures case studies were developed that could be used by Member States to support ETS2 implementation. More detail on the case study development is provided in Section 2.

2. DEVELOPED BEST PRACTICES

This section of the report provides an expansion of the case studies which have been developed into best practices. Member States can take inspiration from these, to implement similar measures themselves to promote effective long-term decarbonisation in the ETS2 sectors, with short-term initial impact.

Case studies were developed using information collected through each of the 5 steps highlighted above in Figure 1-1. Desk research undertaken in Step 2 of the methodology had been elaborated with arguments posed during a webinar with expert stakeholders on May 6th, 2025, as well as inputs and up to date sources provided directly from Member States which fed the ranking process under Step 4.

The case studies follow the same structure for each measure presented, as follows:

2.1.1 Case Study example structure

Overview of the measure

2.1.1.1 Objectives and scope of the measure:

Category and type of measure, who is the target stakeholder for the measure?

2.1.1.2 Geographic scope:

Is the measure implemented in one MS or multiple, is there much variation to implementation?

2.1.1.3 Rationale, intervention logic and addressed barriers

What is the key barrier(s) addressed by the measure? Describe how the measure itself will function in order to achieve its objective.

Impact of the measure

2.1.1.4 Expected impacts:

Actual and potential costs (social and public), are other stakeholders affected by the measure outside of the target recipients? Benefits (achieved and potential emissions/energy savings/other targets associated with the measure). Interaction/synergies with other policies/ other potential complementary measures.

2.1.1.5 Scalability:

Extent to which the measure can be scaled up and affect a wider range of stakeholders in the same sector, and other sectors.

2.1.1.6 Replicability:

To what extent can the measure and impact be replicated in other Member States? In which (type of) Member States is the measure likely to have most impact?

Practicalities around implementation of the measure**2.1.1.7 Speed of implementation:**

Implementation speed, costs and other key points to consider.

2.1.2 Summary of developed case studies

In total 21 best practice case studies have been developed: 9 for Road transport, 7 for buildings and 5 for Industry, with 3 high potential measures for the future included under Section 3. A list of the measures developed in this report are highlighted in Table 2-1 below.

Table 2-1 Summary table of developed best practices

Challenge addressed	Name of the supporting measure	Geographical scope	Category/type of measure
Road Transport			
Personal transport/modal shift			
High up-front costs of ZEVs	Emission based taxes and tolls (bonus-malus). Tax advantaged for ZEV and malus for ICEV	FR, NL, AT, DEN, SE, BE, NO	Financing - Tax incentives
High cost of public transport	Reduced and simplified ticket pricing for public transport	NL, AT	Regulation & standards
Lack of incentives for modal shift away from cars	On-demand transport	BE, ES, DE, NL	Regulation & standards
Support for commercial entities to adopt EVs for their fleets	CO2 based Tax deductibility for company cars	BE	Financing - Tax incentives
Access to affordable public charging infrastructure	Price transparency for public charging	EU, DE	Regulation & standards
Lack of incentives for modal shift away from cars	Urban transport planning towards modal shift - Superblock model	ES, AT, DE	Regulation & standards
Freight Transport			
	Financial incentives for grid connection of charging infrastructure for heavy-duty	DE, ES, FR IT	Financing grants/subsidies -

Challenge addressed	Name of the supporting measure	Geographical scope	Category/type of measure
Concerns over charging infrastructure and grid connection (including costs)	vehicles, including grid connection		
	Streamlining and harmonising administrative processes for grid connections	NL, UK	Regulation & standards
High comparative operating cost of ZEV options	Eurovignette – Truck tolling in favour of ZE HDVs.	DE	Financing – tolling mechanism
Buildings			
Renewable-Based & Renewable-Ready heating technologies			
Private value for money (long payback periods)	Acting to reduce electricity prices for specific technologies (e.g. heat pumps)	DE, BE, GR, IE, LU, CR, MT, ES	Regulation & standards, Financing - Tax incentives
Reputation and information	Information about heat pumps and tools	FI, NL	Awareness, technical support and training
Energy Demand			
Private value for money (Long payback periods)	On-bill-financing	FR, IT, NL	Financing - Soft loans/loans
Private value for money (Long payback periods)	State guaranteed and interest-free loans for energy efficiency measures	Brussels - BE	Financing - Soft loans/loans
High age of building owners			
Reputation and information	Energy efficiency information programmes and tools	LV, CZ, SI, FR, DE	Awareness, technical support and training
Renewable-Based & Renewable-Ready heating technologies & Energy Demand			
Private value for money (high up-front costs)	Subsidies for building renovation	EE, AT, FR, DE, SI	Financing - grants/subsidies, Financing - Soft loans/loans
	Tax deductions for energy efficiency renovations and renewable heating systems / VAT reductions	AT, BE, BG, CY, CZ, DE, EE, EL, FI, FR, IE, IT, LT, LU, LV, NL, PL, PT, RO, SI	Financing - Tax incentives
Industry			
Willingness			
Insufficient incentives and costly period of downtime			
Policy and value-for-money uncertainty	Financing schemes supporting energy efficiency investments	AT, FI, DE, HU, IT, LV, NL, PL ES	Financing - grants/subsidies/Soft loans/loans
Long payback periods			

Challenge addressed	Name of the supporting measure	Geographical scope	Category/type of measure
Insufficient incentives and costly period of downtime	Voluntary Energy Efficiency Agreements	BE, FI	Voluntary agreements, Financing - grants/subsidies
Feasibility			
Lack of internal skills and awareness	Energy audits	AT, FI, IE	Awareness, technical support and training
	Provision of external support	AT, CY, FI, IE, SE	Awareness, technical support and training
Lack of technical readiness of alternative technologies	National Investment Funds supporting R&I and demonstration projects	FR, DE, IE, NL	Financing - grants/subsidies

2.2 ROAD TRANSPORT

This section presents the 9 best practice case studies developed to promote decarbonisation of the road transport sector.

2.2.1 Case Study: Emission-based acquisition and registration taxes (bonus-malus). Tax advantages for ZEV and malus for ICEV

Overview of the measure

2.2.1.1 Objectives and scope of the measure

These tax measures aim to increase the acquisition cost of ICEVs with high CO₂ emissions and fuel consumption, while reducing the financial burden for ZEVs through the introduction of CO₂-based charges. These measures target private and business customers purchasing and registering new vehicles. A CO₂-based vehicle registration tax can be combined with a premium for zero-emission vehicles in order to implement a bonus-malus or 'feebates' system.

2.2.1.2 Geographic scope

Several Member States have implemented CO₂-based registration tax or levies (e.g. AU, EE, ES, FI, FR, NL⁷).⁸ The design of these measures varies in terms of the factors considered—often extending beyond CO₂ emissions to include elements such as vehicle weight—as well as in the level of charges applied and the presence of emission thresholds that trigger significantly higher costs.

The Austrian Normverbrauchsabgabe (NoVA) is a levy that must be paid when a motor vehicle is first registered in Austria. This consists of two components, both of which are calculated based on the CO₂ emissions of the vehicle (WLTP). On the one hand, this is a tax rate to be applied to the net price of the vehicle, which is higher depending on the emissions of the vehicle and amounts to a maximum tax rate of 80%. To calculate the tax rate, the vehicle's CO₂ emissions (WLTP) are first reduced by 94 g/km. The remaining amount is then divided by 5 to determine the percentage rate applied to the net price. For example, if a vehicle emits 119 g/km, the difference to 94 is 25. Divided by 5, this results in a tax rate of 5%. In addition, there is a malus component for vehicles with emissions of over 155 gCO₂/km. For every gram above this value, there is a €80 penalty. For vehicles with emissions less than or equal to 96g/km, no NoVA levy is payable. If these two components result in a tax liability, an amount of €350 will be deducted from the calculated tax^{9,10}.

⁷ https://download.belastingdienst.nl/belastingdienst/docs/bpm_forms_bpm651z14fdeng.pdf

⁸ <https://erf.be/statistics/taxation-2024/>

⁹ <https://onlinerechner.haude.at/BMF-NoVAREchner>

¹⁰ <https://www.volkswagen.at/nova>

In France¹¹ and Estonia¹², the mass of the vehicle is also included in the registration tax calculation. For vehicles above a specific weight threshold, a larger tax must be paid.

While the NoVA system does not include a bonus for ZEVs, other systems in the EU do, such as those in France and Sweden. France has the longest experience with a bonus-malus system, having established its program over 14 years ago. Bonus-malus systems balance the reduced revenue from low-emission vehicles with increased charges on high-emission ones, minimizing or improving fiscal impact on public budgets.

2.2.1.3 *Rationale, intervention logic and addressed barriers*

A CO₂-based vehicle registration tax influences costs in favour of low-emitting ICEVs and ZEVs, making them more economically attractive for private individuals and businesses alike. The goal is to incentivise efficient vehicles and to close the gap in the acquisition costs of ZEVs compared to ICEVs. Compared to simple funding schemes for ZEVs, the benefit is that no additional public funds are required to support their market uptake, which makes this measure sustainable and viable in the long term if it is reviewed and adjusted regularly. In order to ensure social fairness, the design of such measures should take into account their distributional effects. For instance, France has adjusted its bonus scheme for ZEVs to provide greater incentives for low-income households, thereby strengthening the progressive nature of the measure.

Impact of the measure

2.2.1.4 *Expected impacts*

Experts consider this measure to be effective as it makes ZEVs more attractive and discourages the acquisition of ICEVs, effectively steering consumers towards electrification. The policy can be gradually intensified by lowering the bonus-malus thresholds to further incentivise ZEV purchases or adjust the revenue. Initially, highly efficient and low-emission ICEVs compete with ZEVs, as has been observed in France in recent years. However, this measure should be accompanied by the provision and funding of public and private charging infrastructure. Additionally, financial support for lower-income households is necessary to ensure the policy is socially equitable. Within a bonus-malus system, the registration tax can provide the revenue to incentivise the purchase of ZEVs when designed to be revenue neutral.

The NoVA, introduced in 1991, was significantly tightened in 2020, with the maximum tax rate for 2024 being raised from 32% to 80%, the penalty amount being doubled from €40 to €80, and the penalty threshold being lowered from 275 to 155 g. For new registrations in 2025, emission savings of 669,000 tonnes of CO₂ were estimated as a result of this adjustment to the NoVA within the useful life. The tax revenue from NoVA for new registrations, amounts to €100 million. This increase in tax revenue will be reduced by €23 million due to the induced reduction in fuel consumption – and thus mineral oil tax revenue – during the useful life.¹³

2.2.1.5 *Scalability*

The measure is scalable and can be expanded to cover different vehicle classes and properties (e.g. weight), depending on specific requirements. Since these are typically national regulations, they have broad applicability. However, it is advantageous if certain existing structures and prerequisites are already in place. In addition to the registration tax, CO₂-based taxes or fees could be used for annual vehicle tax or tolling, which would further incentivise low-emitting vehicles and ZEVs.

2.2.1.6 *Replicability*

The measure can be effectively transferred to other Member States, provided that existing tax are expanded to include a CO₂ component. The presence of a registration tax significantly facilitates the integration of a CO₂ component compared to establishing such taxes from scratch. Thresholds and charge levels must be adjusted to the country's specific circumstances (e.g., ZEV share, average CO₂ emissions) to avoid overburdening consumers or, if implemented as a bonus-malus-system, placing excessive financial strain on the state through bonus payments.

In countries with a high proportion of new registrations, the measure has particularly high potential.

Practicalities around implementation of the measure

¹¹ https://www.transportenvironment.org/uploads/files/2024-02-taxes-for-heavier--larger-vehicles-SUVs_2024-10-07-151754_fjr.pdf

¹² <https://unicount.eu/en/estonian-car-tax-2025/>

¹³ https://oehw.at/wp-content/uploads/2023/12/oehw_21-033_eckerstorfer-riegler_nova-reform.pdf

2.2.1.7 *Speed of implementation*

If a vehicle registration tax is already in place, the process should be relatively quick, as existing legal and administrative structures can be adapted. In such cases, implementation may be possible in under a year. However, if no such tax exists, the process can take over a year due to the need for new legislation, institutional setup, and enforcement systems. Planning includes establishing financial frameworks and coordinating with relevant authorities, businesses, and monitoring bodies.

2.2.2 **Case Study: Reduced and simplified ticket pricing for public transport**

Overview of the measure

2.2.2.1 *Objectives and scope of the measure*

Given the growing importance of public transport in national agendas for reducing GHG emissions in line with European environmental objectives, the need has arisen to simplify and promote its use in various ways. This chapter presents two measures: the OV-chipkaart and Klimaticket Ö.

The OV-chipkaart was first launched in Rotterdam in 2005 and later expanded across the country in 2010. It is a unified national fare system used by all major public transport operators on the Dutch mainland. Since mid-2022, the Netherlands has introduced OVpay, a system complementary to the OV-chipkaart, which allows users to check in to public transport using contactless debit or credit cards and mobile devices.

The KlimaTicket Ö is a national public transport initiative launched in Austria in 2021. Its primary objective is to promote the use of public transportation as a means to achieve climate-related goals, particularly the reduction of greenhouse gas emissions and air pollution. The measure simplifies access to public transport by offering a single subscription that covers all modes of public transportation across the country, including buses, trains, and subways. This initiative targets the entire population, regardless of age, with special pricing available for selected groups.¹⁴

The promotion of public transport was also considered important due to the need to restore ridership following the decline in passenger volumes caused by the COVID-19 pandemic.

The KlimaTicket Ö is part of a broader strategy that includes significant investments in the modernisation and expansion of public transport infrastructure including the improvement of local and regional transport services, ensuring that the increased demand generated by the KlimaTicket is met with adequate supply and quality of service.¹⁵

2.2.2.2 *Geographic scope*

The OV-chipkaart is implemented across the Netherlands.

The KlimaTicket is implemented across Austria, encompassing both national and regional levels. While the national KlimaTicket Ö provides access to all public transport services throughout the country, Austrian residents can also choose from seven regional KlimaTickets and six city-specific passes, depending on their travel needs.¹⁶

Each of these options adheres to the same core principle: a single subscription that grants access to all public transport within the designated area, excluding services intended for tourism. The concept of a unified transport ticket in Austria dates to 2006, with Vienna introducing a first local version in 2012. The national rollout in 2021 marked a significant expansion of this model.

Similar initiatives have been adopted in other European countries. Germany introduced a €9 ticket which was valid for all public transportation (except long-distance trains) throughout the country and relied heavily on public funding. The 9-euro-ticket was later replaced by the €49 Deutschlandticket, which has similar coverage but is more financially sustainable.

Luxembourg has implemented free public transport for both residents and tourists, while several European cities have also adopted free public transport schemes.

¹⁴ [KlimaTicket](#)

¹⁵ Ibid14.

¹⁶ Ibid14.

2.2.2.3 *Rationale, intervention logic and addressed barriers*

The OV-chipkaart and OVpay simplify the way users access public transport by unifying both payment methods and the tracking of public transport usage. These systems also offer potential for expansion into other services. One example is OV-fiets (fully integrated with OV-chipkaart and OVpay), a nationwide bike-sharing system designed to encourage cycling, particularly for the “last mile” of journeys, i.e., from train or bus stations to the final destination. This system provides a convenient and relatively inexpensive way to travel, promoting the use of more sustainable modes of transport. As of 2024, there were around 22,000 bikes available at 282 locations.¹⁷

The KlimaTicket Ö addresses multiple barriers to public transport use by offering a comprehensive, affordable, and user-friendly solution. By setting the cost at approximately three euros per day - and even less for discounted groups - the measure significantly lowers the financial barrier for both regular and occasional users. It also enhances convenience by integrating various modes of transport into a single ticket, thereby simplifying the user experience and making public transport a more attractive option.

Importantly, the KlimaTicket Ö is not a standalone measure. It is supported by substantial public investment aimed at improving the quality and capacity of the transport network.¹⁸ This dual approach, which is based on stimulating demand while simultaneously enhancing supply, is crucial to the success of the initiative. Without corresponding improvements in infrastructure and service, increased demand could lead to overcrowding and a decline in service quality, as observed in Germany’s €9 ticket experiment. In that case, while car use declined only slightly, the affordability of public transport led to overcrowding and reduced user satisfaction.¹⁹ Austria’s approach seeks to avoid these pitfalls by ensuring that service improvements accompany fare reductions.

Impact of the measure

2.2.2.4 *Expected impacts*

There are currently no estimates for the emissions reduction associated with the potential behavioural changes resulting from the implementation of the unified payment system. However, some information on the OV-fiets is available. In 2024, 5.9 million rides were registered, up from 3.1 million rides in 2017 (although in 2017 only 14,500 bikes were available).²⁰ A study carried out an analysis of the OV-fiets program, focusing on financial, environmental, and health impacts. The results show that, in general, the program has benefited Dutch society, with benefit to cost ratios ranging from 1.1 in a pessimistic scenario, where the least favourable conditions are assumed, to 2.4 in an optimistic scenario. According to this research, the most important benefits are improved accessibility, reduced road congestion, and health benefits due to increased physical activity. At the same time, the methodology applied in this study may underestimate the environmental impacts of the programme, particularly regarding avoided emissions from modal shifts. This means that the overall environmental benefits are likely to be greater than reported. Further research would therefore be valuable to better capture and quantify these effects, providing a more complete picture of the contribution of such schemes to decarbonisation.

As for costs, the government bears the majority, primarily due to investment costs (78 percent), along with reduced tax revenue and infrastructure maintenance, which together account for 7 percent of total costs. Society bears 10 percent of the costs through road safety impacts, while the remaining 5 percent is borne by operators in the form of operational losses.²¹

The KlimaTicket Ö is expected to contribute significantly to the reduction of carbon emissions from the transport sector, which accounts for a disproportionately high share of Austria’s total emissions compared to the OECD average.²²

The reduction in CO₂ emissions is estimated in 65,000 tonnes of CO₂e in 2021. In the first month following its launch, 130,000 KlimaTickets were sold. By August 2023, this number had risen to 250,000, meaning that

¹⁷ [NS Annual Report 2024](#)

¹⁸ [KlimaTicket](#).

¹⁹ [Public transport pricing: An evaluation of the 9-Euro ticket and an alternative policy proposal - ScienceDirect](#)

²⁰ [NS Annual Report 2024](#)

²¹ [Societal costs and benefits analysis of integrating bike-sharing systems with public transport: A case study of the public transport bike \(‘OV-fiets’\) in the Netherlands - ScienceDirect](#)

²² [Austria’s “KlimaTicket” to promote low-carbon mobility | OECD](#)

nearly 3% of the Austrian population held a nationwide KlimaTicket Ö. When regional tickets are included, the share rises to 13%.

A survey conducted by the Austrian Ministry for Climate Action (BMK) found that 98% of respondents were satisfied with the (national) KlimaTicket, with 70% of trips being long-distance and 30% regional. While national-level data on changes in public transport usage are not yet available, Vienna's experience offers some insight. Since the introduction of its local KlimaTicket in 2012, car use in the city has declined from 31% to 25% of total trips, while public transport usage has increased slightly, from 36% to 38%.²³ However, the decrease in car usage cannot be attributed solely on the effects of the KlimaTicket.

The 2022 KlimaTicket report finds that up to 20% of KlimaTicket journeys would have been made predominantly by passenger car, while up to only 5 percent of journeys would not have been made at all without the KlimaTicket Ö.²⁴ Additionally, 2% of KlimaTicket-owners are new public transport users.²⁵

The measure is partially funded through ticket sales, which contribute to its financial sustainability. In 2022, the federal government allocated €160 million to support the initiative. Regional governments finance their own versions of the KlimaTicket but receive €180 million from the central government to support implementation and expand public transport services.²⁶

The KlimaTicket is also designed to work in synergy with other policies, particularly those aimed at improving transport infrastructure. This integrated approach ensures that the increased demand generated by the KlimaTicket does not compromise service quality.

2.2.2.5 Scalability

The OV-chipkaart, OVpay, and OV-fiets represent a strong example of scalability. Starting with a payment system implemented in a single city, the program was expanded both geographically and in terms of the services offered. New technologies enabled the unified payment system to incorporate contactless payment methods, such as bank cards and smartphones. Furthermore, the system was integrated with a bike-sharing program designed to encourage the use of public transport, especially when deployed in a coherent and well-coordinated manner on the ground.

The KlimaTicket Ö has demonstrated strong scalability, evolving from a local initiative in Vienna to a nationwide program. This expansion has enabled the measure to reach a broader segment of the population, including those who need to travel long distances across different regions, but still allowing citizens to purchase tickets based on their travel needs (i.e., regional tickets are available for those who travel mainly in one region). The integration of various transport modes into a single subscription model has proven effective in both urban and rural contexts. The measure's design allows for further expansion, potentially incorporating additional services such as bike-sharing or micro-mobility options. Its success in Austria suggests that similar models could be scaled within other sectors or regions, provided that the necessary infrastructure and coordination mechanisms are in place.

2.2.2.6 Replicability

When it comes to replicability, the Dutch model is easily implementable in other Member States. At this point in time, the technology used is widespread and can be implemented without major obstacles. The main challenge may arise in terms of coordination, especially in contexts where multiple local, regional, or national companies provide public transport services. In this regard, a mediating role by central governments is essential, as they are best placed to represent the interests of citizens, who would benefit from the positive effects of such programs.

The Austrian model is highly replicable in other Member States, especially those with existing public transport infrastructure and a willingness to invest in sustainable mobility. Unlike fully subsidised systems, the KlimaTicket Ö is partially self-financing (through the sale of tickets) while offering an affordable transport solution to its customers, making it a more sustainable option for countries with limited public budgets. The fixed-price model ensures accessibility while maintaining financial stability through user contributions. This

²³ [Fare's Fair: Experiences and Impacts of Fare Policies](#)

²⁴ [ClimateTicket Report 2022](#)

²⁵ [22_MA_Justin_Treutlein_Klimaticket.pdf](#)

²⁶ [KlimaTicket23](#).

balance makes the measure adaptable to different national contexts, with adjustments in pricing, eligibility, and funding mechanisms. Countries with fragmented transport systems may face greater challenges in implementation (with higher benefits for final customers in terms of simplification), but Austria's experience shows that with sufficient coordination and stakeholder engagement, these challenges can be overcome. The measure is likely to have the greatest impact in urbanised Member States with high levels of car dependency and strong climate commitments.

Practicalities around implementation of the measure

2.2.2.7 Speed of implementation

The speed at which these measures can be implemented depends on several factors, including the structure of the public transport market, the capacity of the existing network, and the organizational capabilities of the central authorities.

In the Netherlands, the OV-chipkaart was first introduced in Rotterdam in 2005. In the following years, coverage was gradually expanded until 2014, when the system became the universal fare system across all public transport in the Netherlands. The OV-fiets was first introduced in 2003 in selected locations and was progressively expanded as demand for bikes increased. Building on these experiences, similar programs can be adapted and implemented in a shorter timeframe.

In Austria, the presence of annual network tickets in provinces such as Vienna, Tyrol, and Vorarlberg provided a solid foundation for national expansion. The development of the KlimaTicket Ö took approximately eighteen months of preparation and negotiation. Pre-sales began on October 1, 2021, and by January 1, 2022, all federal regions had launched their own region-specific KlimaTickets. This relatively rapid rollout was facilitated by prior experience, political commitment, and effective coordination among stakeholders.²⁷

2.2.3 Case Study: On-demand transport

Overview of the measure

2.2.3.1 Objectives and scope of the measure:

On-demand transport (ODT), also called Demand Responsive Transport (DRT), offers a flexible alternative to fixed public transport by adapting services to passengers' actual needs, improving accessibility in underserved or rural areas. ODT bridge the gap between private taxis and conventional public transport, providing spatial, temporal, and operational flexibility through pooling of passenger requests. Services include flexible-route options, which can deviate to predefined stops and adjust schedules, and door-to-door options, which respond entirely to real-time demand.

On-demand transport also consists of other services. For example: ride sharing services allow aggregation of the mobility demand for sharing a ride in the same vehicle (e.g. carpooling); and/or to use the same service (e.g. taxi) together with other persons. While asset sharing services allow passengers to utilise/pick-up a specific means of transport (bike, car, E-scooter, etc) without any property issue; users must be registered to common platforms. DRT covers a number of different roles in the mobility sector and is aimed at numerous different actors, dependant on the model. Notably, DRT supports low-income households, senior citizens, people with disabilities, students, tourists and citizens living in rural areas.

2.2.3.2 Geographic scope:

DRT models have been implemented in numerous MSs either as pilot schemes in certain provinces and in some cases, also with longer term financing structures and success.

In Flanders, Belgium, the former Belbus²⁸ system was replaced in January 2024 by De Lijn Flex, which now provides region-wide coverage through app- and phone-based booking.²⁹ In the Hanover Region of Germany,

²⁷ <https://www.bmimi.gv.at/themen/mobilitaet/1-2-3-ticket/fakten.html#:~:text=Rechtliche%20Umsetzung%3A%20Zustimmung%20%C3%BCber%20Parteigrenzen,April%202021%20in%20Kraft%20getreten.>

²⁸ Belbus was introduced in Flanders in 1991.

²⁹ [De Lijn Flex - De Lijn](#)

sprinti began as a pilot in three municipalities in 2021 and expanded in December 2023 to twelve municipalities, with a mixed fleet of roughly 120 vehicles.³⁰

Alongside these large-scale regional schemes, a range of more localised models illustrate how DRT adapts to different contexts. In Ireland, Ring a Link has operated since 2001 as a community-based provider, offering rural mobility through 23 owned minibuses and 10 contracted vehicles.³¹ In the Netherlands, Texelhopper integrates a fixed ferry shuttle and a main bus line with a network of nine demand-responsive minibuses across the island of Texel, ensuring connectivity via app-based bookings and payment through the national OV-chipkaart.³² In Spain, Vallibús Connecta't serves suburban neighbourhoods through three flexible lines with 87 stops, where trips are booked in advance and routes are optimised in real time to reduce waiting and travel times.³³ In Germany, EMMI-MOBIL operates in the small town of Bad Hindelang with two electric minibuses providing on-demand rides without timetables or routes, often connecting passengers to conventional buses, with free access included in local tourist passes.³⁴

2.2.3.3 *Rationale, intervention logic and addressed barriers*

The rationale for introducing on-demand transport lies in addressing the structural limitations of traditional fixed-route services, which often struggle with low occupancy, high operating costs, and poor alignment with actual mobility needs. Conventional public transport networks tend to be designed for high-density corridors and peak flows, leaving dispersed demand patterns underserved, whether in rural, suburban, or even certain urban contexts. This creates significant barriers to accessibility, reinforcing dependence on private cars, contributing to transport poverty, and increasing emissions.

DRT intervenes by replacing or complementing low-performing routes with flexible, algorithm-based pooling systems that match passenger demand in real time. Through digital booking platforms and integration with existing ticketing and timetables, these schemes reduce wasted kilometres, optimise vehicle occupancy, and improve service responsiveness. They have been deployed both to strengthen connectivity in rural areas with limited public transport coverage and to support urban and suburban mobility by providing off-peak, nighttime, or feeder services to mainline rail and bus networks.

More broadly, on-demand transport forms part of a wider set of measures that can incentivise modal shift away from private car use, while also providing critical first- and last-mile connectivity that ensures public transport becomes a viable and convenient option across diverse mobility contexts.

Impact of the measure

2.2.3.4 *Expected impacts:*

The expected impacts of demand-responsive transport schemes reflect a combination of increased accessibility, ridership growth, and environmental benefits, alongside investment and operational challenges. Across Europe, schemes such as Ring-A-Link, Texelhopper, Vallibús Connecta't, De Lijn Flex, and sprinti have demonstrated measurable uptake and evolving service patterns. Ring a Link in Ireland grew from 50,000 annual riders in 2009 to over 200,000 in 2022, expanding coverage to students and commuters, and shifting from primarily social-inclusion services to a broader mobility role as regular services are strengthened under the national Connecting Ireland program. Similarly, Vallibús Connecta't served around 15,500 passengers in 2022, with plans to expand via taxi services to cover more stops, while Texelhopper in the Netherlands saw strong seasonal ridership increases, particularly among tourists, supported by app-based booking, e-ticketing, and algorithmic route optimisation.³⁵ In Flanders, De Lijn Flex has improved accessibility, booking convenience, and integration with regional mobility policies, while sprinti in Hanover recorded two million passenger journeys by October 2024, with daily ridership around 3,500 and 25% of its fleet electrified, contributing to reduced local emissions.

Challenges include low occupancy rates in some areas, rising operational costs due to subsidy reductions, and the need to support digitally excluded groups. Overall, these initiatives illustrate the potential of DRT to

³⁰ ["Sprinti" becomes the largest on-demand public transport system in Germany](#)

³¹ [SMARTA-GP-Ring-a-Link.pdf](#)

³² [9-Texelhopper-DRT-NL.pdf](#)

³³ [5.-Vallibus-Connectat-ES.pdf](#)

³⁴ [EMMI-MOBIL - Mobility in the Allgäu | Bad Hindelang](#)

³⁵ [9-Texelhopper-DRT-NL.pdf](#)

enhance accessibility, support multimodal integration, and contribute to low-carbon mobility while offering synergies with broader transport policies.

Integration

The success of DRT services depends significantly on how well they are integrated with existing public transport networks. A key challenge lies in the discrepancy between operators: while shared mobility services are often provided by smaller players, they need to connect with larger, conventional actors in the public transport network. The degree of integration varies, but for a DRT system to function effectively, it must be designed to fill a gap or complement existing services. This involves carefully defining service zones, operating hours, and use cases—whether as first- and last-mile solutions or as replacements for underused fixed-route services.

Integrating DRT into existing infrastructure models is equally important, as this reduces costs and helps maintain efficiency. The Texelhopper illustrates this point effectively, having included flexible services within the broader transport system on the island. Digital integration is another critical factor. The Dutch case of ticketing integration, where the national OV-chipkaart³⁶ can be used on the Texelhopper, demonstrates how DRT can align with established public transport systems and simplify the user experience.

At the same time, successful elements of DRT can also be transferred into conventional public transport. These include the use of algorithms that enable services to adapt to real-time demand, as well as integrated digital platforms that combine multiple modes (such as bike sharing, traditional public transport, and DRT) into a single, accessible application. In certain contexts, DRT could potentially serve as a full replacement for conventional public transport, offering comparable service quality at lower cost due to greater efficiency in routing and stop patterns.³⁷

2.2.3.5 Scalability:

Demand-responsive transport can be scaled from pilot projects to broader regional coverage when there is sufficient demand and proper planning. Feasibility studies, as conducted for Vallibús Connecta't, help identify suitable lines, passenger volumes, and resource requirements, including drivers and vehicles. Effective communication with local communities, as seen with Texelhopper in the Netherlands, can overcome initial resistance, while adjustments to legal frameworks ensure alignment with existing transport systems. Integration of digital booking platforms with larger public transport or national ticketing systems simplifies access for passengers and encourages uptake. An example of successful scaling is sprinti, which grew from three pilot municipalities to twelve within two years. The principles of demand pooling, app-based booking, and integration into fare systems enable scalability within the passenger transport sector and offer potential for adaptation to other domains such as healthcare transport or community-based shuttle services.

2.2.3.6 Replicability:

DRT is highly flexible and can be replicated across EU Member States, particularly in regions with dispersed populations, limited connectivity to mainline public transport, or aging demographics. Replicability depends on adequate funding, digital infrastructure, and the capacity of regional authorities to integrate DRT into fare and scheduling systems. Schemes like Texelhopper benefit from ongoing provincial support, illustrating the importance of financial backing. In areas with an older population and/or limited familiarity with digital tools, the successful replication of such services may require investments in training people to use the necessary apps, and/or the inclusion of more familiar methods, such as booking by phone.

Practicalities around implementation of the measure

2.2.3.7 Speed of implementation:

Demand-responsive transport services can be implemented relatively quickly, particularly when supported by clear funding mechanisms, regulatory frameworks, and user engagement. Local-level pilots in Flanders and Hanover transitioned to large-scale operations within two to three years, with De Lijn Flex covering the entire region by January 2024 and sprinti expanding to twelve municipalities by December 2023, securing funding

³⁶ See Case Study on reduced and simplified ticketing pricing for public transport for further information integrated ticketing.

³⁷ [Potential Benefits of Demand Responsive Transport in Rural Areas: A Simulation Study in Lolland, Denmark](#)

through at least 2027. Similarly, rural schemes in other Member States show rapid deployment when financing and planning are in place. In Ireland, Ring-a-Link is heavily subsidised through a mix of passenger receipts, National Transport Authority support, Department of Social Protection contributions, and local authority funds, while Vallibús Connecta't in Spain is primarily municipality-funded and supplemented by ticket revenues and external funds. Texelhopper in the Netherlands required substantial initial investment (EUR 1.7 million) and subsidies (EUR 300,000), but is expected to reach self-sufficiency after 100,000 trips. Regulatory frameworks also influence implementation speed, as local governments may have limited mandates to support rural mobility, and citizen engagement—such as Vallibús staff assisting passengers with app use—can facilitate adoption. Across all cases, the main time and cost drivers are establishing digital booking systems, contracting operators, and conducting communication campaigns, highlighting that DRT can be deployed efficiently to address gaps in public transport coverage when these conditions are met.

2.2.4 Case Study: CO₂-based tax deductibility for company cars

Overview of the measure

2.2.4.1 Objectives and scope of the measure

This is a tax measure aimed at companies with commercially registered vehicles. An effective measure to promote ZEVs is to restrict access to tax incentives for companies based on vehicle emissions. This means that, if there are corresponding advantages for ZEVs, higher depreciation amounts can be claimed as operating expenses. This reduces the company's profits and, depending on the type of company, reduces the corporation tax or income tax payable. The higher tax deduction for low-emission and zero-emission vehicles encourages companies to purchase such vehicles and offsets the higher purchase costs compared to conventional vehicles. The effectiveness of the measure depends on the total tax differential.

2.2.4.2 Geographic scope

Several European Member States have introduced higher tax deductions for commercially registered cars with low emissions.³⁸ The measure is often coupled with further financial incentives. Implementation shows major differences in terms of the benefits for ZEVs at national level.

Belgium stands out for its particularly ambitious tax depreciation scheme which has been met with a strong market response. While zero-emission cars can currently be 100% depreciated as operating expenses over their lifetime, the maximum deductibility for conventional cars is currently 75% and will be reduced continuously in the coming years (2025: 75%, 2026: 50%; 2027: 24%; 2028: 0%). The increased depreciation of ZEVs is supplemented by further tax incentives in Belgium. These include a benefit-in-kind taxation, which is particularly favourable for ZEVs, a so-called 'solidarity contribution' that all companies pay and which also has a CO₂ spread, as well as advantages in terms of ownership taxation for ZEVs.³⁹

2.2.4.3 Rationale, intervention logic and addressed barriers

Company cars account for 60% of new registrations in the European passenger car market and, given their higher mileage compared to private cars, are responsible for 74% of CO₂ emissions from all new registrations. At the same time, the company car market is still lagging behind the private market in terms of electrification in many EU Member States.⁴⁰ Due to the low average initial ownership period of company vehicles, the company car market also has a strong influence on the structure of the future second-hand market, which is particularly relevant for private owners. Tax incentives for companies that result in a higher proportion of ZEVs therefore also have an impact on the second-hand market after a relatively short delay.

In view of higher procurement costs, the use of ZEVs is not yet sufficiently attractive for many companies. Furthermore, investments must be made in the development of charging infrastructure. The higher tax deductibility of ZEV procurement counteracts these obstacles. The decreasing deductibility of ICEVs makes it easier to plan and creates an increasing incentive for the procurement of ZEV for company fleets.

Impact of the measure

³⁸ https://www.transportenvironment.org/uploads/files/The-good-tax-guide_2024-04-29-152700_elxe.pdf

³⁹ <https://www.kbcbrussels.be/business/en/products/credit/fiscaliteit-bedrijfswagens.html#:~:text=The%20tax%20deductibility%20of%20the%20vehicle%20and%20fuel,minimum%20of%2050%25%20and%20a%20maximum%20of%20100%25%20Taxation%20of%20company%20cars%20%20LeasePlan%20Belgium>

⁴⁰ https://www.transportenvironment.org/uploads/files/Unveiling-Europes-corporate-car-problem_TE.pdf

2.2.4.4 Expected impacts

As the example of Belgium with its very strong scheme shows, the measure can have a very strong effect on demand for ZEVs. While the share of ZEV registrations remained in the single-digit percentage range until 2021 in Belgium, it increased after the introduction of supporting measures for ZE company cars to over 28% in 2024. This increase is mainly due to the rise in company cars, which accounted for over 86% of ZEV registrations in 2024. However, the rapid turnover of company ZEVs into the second-hand market is not yet matched by sufficient private demand, leading to low residual values and uncertainty for fleet operators.⁴¹ Reduced demand in the second-hand market is likely due to concerns over the charging infrastructure, uncertainties regarding battery degradation and limited financial incentives for private buyers.

The increased tax deductibility of ZEVs is combined in many countries with further tax advantages for ZE company cars. These include benefit-in-kind (BIK) taxation for salary cars, VAT deductibility and ownership tax. In particular, the tax deductibility of the procurement of ZEVs has so far been differentiated according to CO₂ in comparatively few countries.⁴² The tax incentives for company cars are often supplemented by a benefit-in-kind tax at national level, which also favours the use of ZEVs. However, the structure also varies greatly between countries.⁴³

If ZEVs are favoured in terms of taxation, increasing demand will result in considerable tax losses, which will burden the public budget. These can be compensated for if the tax advantages for ICEVs are reduced at the same time (see the example of Belgium).

2.2.4.5 Scalability

There are no theoretical restrictions in the scalability of this measure, as all companies can benefit from tax deductions. For implementation, it should be noted that the effectiveness of the measure depends on the availability of suitable vehicle models and the charging infrastructure at different locations (at home, in public, at work). In particular, if only one-sided tax advantages are granted for ZEVs, increasing demand could lead to significant tax losses that would place a burden on public finances. A reduced depreciation allowance for ICEV could be used for refinancing. In addition, the development of demand on the second-hand market and the associated residual value development plays a relevant role in the attractiveness of ZE company cars. If there is no demand for ZEVs on the second-hand market and residual values therefore fall, the economic risks for fleet operators who purchase ZEVs as new vehicles increase.

In addition, there is a risk that an unrestricted tax incentive system will result in the purchase of vehicles from the higher vehicle segments with high-quality equipment, and that ZEV models, which are typically demanded by households with medium and low incomes, will be underrepresented in the second-hand market as a result.⁴⁴

2.2.4.6 Replicability

Since all EU member states have implemented tax deductibility for company cars, a high degree of replicability is generally guaranteed.⁴⁵ The fact that in almost all Member States the majority of new car registrations are made by companies also points to a high degree of transferability.⁴⁶

The measure is expected to have a particularly strong impact in countries that currently have little tax differentiation between ZEVs and conventional company cars and have a good charging infrastructure at different locations.

Practicalities around implementation of the measure

2.2.4.7 Speed of implementation

The introduction of tax measures takes 1–3 years and requires the development of policy measures, legislative approval and administrative arrangements. Coordination with tax authorities, businesses and enforcement

⁴¹ <https://alternative-fuels-observatory.ec.europa.eu/general-information/news/belgium-record-year-bevs-285-market-share-2024>

⁴² https://www.transportenvironment.org/uploads/files/The-good-tax-guide_2024-04-29-152700_elxe.pdf

⁴³ https://www.transportenvironment.org/uploads/files/20241014_TE-Company-car-fossil-fuel-subsidies_Final-report_Addressed_Comments_2024-10-15-100425_uqws.pdf

⁴⁴ Belgium: record year for BEVs, 28.5% market share in 2024 | European Alternative Fuels Observatory.

⁴⁵ https://www.transportenvironment.org/uploads/files/The-good-tax-guide_2024-04-29-152700_elxe.pdf

agencies ensures compliance. As implementation can build on existing tax regulations for company cars, shorter implementation periods are likely.

2.2.5 Case Study: Price transparency for public charging

Overview of the measure

2.2.5.1 Objectives and scope of the measure

This regulatory measure addresses the operation of public charging infrastructure and pricing. It is aimed at charging point operators (CPOs) and mobility service providers (MSPs). It is intended to ensure fair competition and provide consumers with a transparent overview of the market, in order to minimise the costs of purchasing electricity at public charging points.

Price transparency is necessary to create competition between providers of public charging infrastructure and to give customers the opportunity to access locations with favourable charging prices. Today, the price for ad-hoc charging in particular is not fully transparent to customers in advance. The AFIR already sets out requirements for charging infrastructure operators to publish charging prices.⁴⁷ This means that all CPOs must make price and operational data for all public charging points publicly available free of charge by the end of 2024. National implementation is currently underway, which will introduce a uniform data format and allow public data to be used more easily. Experts assume that it will be fully implemented across Europe by 2026.

The Member States differed greatly in terms of the number of CPOs and MSPs and exhibited varying degrees of market concentration, but current studies have not identified any serious distortions of competition. However, it was found that transparency in ad-hoc prices is a factor that most significantly impairs competition in the market.⁴⁸

2.2.5.2 Geographic scope

The AFIR already sets requirements for non-discriminatory access and price transparency for public charging infrastructure. However, the initial situation for public charging infrastructure and the implementation at member state level vary.

By 2026, a national online service providing information on ad-hoc charging fees will be established in Germany, known as the 'National Access Point'.⁴⁹ Price transparency for public charging stations was identified as an important issue in the coalition agreement of the new federal government. Specific measures have yet to be agreed upon.

A roaming mandate is not implemented in the AFIR and therefore cannot be implemented through national legislation. Several Member States are encouraging roaming in other ways (e.g. as a condition in tenders or through other contractual arrangements). A prominent example is Portugal, which promotes nationwide roaming by supporting CPOs and MSPs in integrating into the national roaming platform MOBI.E through the implementation of the Open Charge Point Interface (OCPI) roaming protocol.⁵⁰

2.2.5.3 Rationale, intervention logic and addressed barriers

In addition to the purchase costs of ZEVs, the energy costs are particularly relevant with regard to the overall costs and therefore the purchase decision. Charging at home and at work is currently the most popular option among electric vehicle users. In Europe, more than 70% of charging is carried out at home or at work.⁵¹ Car users (e.g. in apartment blocks in cities) without their own parking space or with a high proportion of long journeys, on the other hand, are heavily dependent on public charging infrastructure.

There are major differences in electricity procurement costs between car owners with and without private charging infrastructure. Car users who are highly dependent on public charging infrastructure have significantly higher electricity costs on average and therefore less incentive to switch to ZEVs. While conventional fuels are equally expensive for all users (at the petrol station) despite large differences in prices in the different EU

⁴⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1804>

⁴⁸ https://theicct.org/wp-content/uploads/2025/02/ID-290-%E2%80%93-EU-charging_IZEVA_final.pdf

⁴⁹ <https://nationale-leitstelle.de/ladeinfrastruktur-im-eu-kontext/>

⁵⁰ https://www.mobie.pt/documents/42032/143944/20230620_MOBIE_OCPI_Phase2_Internal_v1_6.pdf/fdb22f6a-3ffc-529d-8f9f-d27706875de7?t=1716289763105

⁵¹ [EAFO: Electric vehicle recharging prices](#)

countries, there is a differentiated price regime for electricity for ZEVs. While wealthier car owners in particular can charge their vehicles at home with cheap, partly self-produced electricity, people without private charging facilities - including a high proportion of low-income households - tend to be dependent on more expensive public charging stations. Charging stations at the workplace could offer an economic solution for workers. Since VAT on publicly charged electricity is normally higher than on household electricity in several EU member states, the price difference increases further in these cases.

In view of the early market phase, competition in public charging is not yet fully developed and pricing is still not fully transparent to users and partly complex. Although kWh-based billing now dominates the market, there are also time-based tariffs and combinations of time- and kWh-based tariffs, as well as other combinations with flat fees, parking fees and roaming charges. The aim of the measure is therefore to increase competition between charging infrastructure and mobility providers, create non-discriminatory access to public charging infrastructure and establish price transparency for users.

Impact of the measure

2.2.5.4 Expected impacts

Several studies on the effects of greater price transparency are currently available.⁵² Although increased price transparency also carries the risk of increased price fixing between market players, it is assumed that the positive effects of greater transparency for customers outweigh the negative effects. In this context, it is also relevant that ad-hoc prices are often cheaper than contract prices at MSPs, but this is often not apparent to customers due to a lack of transparency.

Further measures are considered essential to increase competition in price formation. These include non-discriminatory access to charging infrastructure and the removal of technical barriers to ad-hoc payment, which is often incompatible with the plug-and-charge approach. As a result, according to AFIR, from 13 April 2024, a low-threshold payment method for ad hoc charging will be mandatory for newly installed charging points, and this will apply to all fast chargers by 1 January 2027. In addition, the allocation of public space for charging locations should be more competitive, as it has been found that regional monopolies sometimes exploit their market power in pricing.

2.2.5.5 Scalability

A pre-requisite for the measure to be fully effective is that price transparency is created for all public charging points. Corresponding specifications are already being made throughout the EU via the AFIR and must be implemented at national level.

2.2.5.6 Replicability

The maturity and market structure of the charging infrastructure varies in the EU Member States. The AFIR makes it imperative to implement the price transparency requirements. The measures can only be expected to be highly effective if they are combined with other national measures to improve competition (see above).

Practicalities around implementation of the measure

2.2.5.7 Speed of implementation

The AFIR guidelines require the rapid implementation of public price information on ad-hoc charging and low-threshold payment methods. The measures are currently being implemented at national level. Experts believe that member states bear primary responsibility for the rapid implementation of price transparency requirements and for national monitoring of compliance with these requirements by infrastructure operators.

2.2.6 Case Study: Urban transport planning towards modal shift - Superblock model for redistribution of public spaces

Overview of the measure

⁵² https://theicct.org/wp-content/uploads/2025/02/ID-290-%E2%80%93-EU-charging_IZEVA_final.pdf

2.2.6.1 Objectives and scope of the measure

Urban planning is a highly important tool that can be used to (re)organise urban space. In the context of this measure, urban planning can be used to redistribute the space allocated to different means of transport, restricting capacity of private vehicles and increasing capacity of active mobility and public transport. This tool is particularly important in cities with a severe shortage of public space, where the strengthening of a transport mode (e.g., public transport) requires the redistribution of this scarce space.

Superblocks are a policy tool that consists in the creation of areas (the superblocks) where traffic is restricted and public space is repurposed. They aim to reduce traffic through changes to urban planning. The measures generally contribute to climate change mitigation through shifting to more sustainable transport modes, accompanied by a number of co-benefits such as improved living and health conditions of inhabitants within the restructured area.

On a more practical level, access to interior roads within superblocks are significantly reduced, by closing off street junctions and implementing one-way systems. Public transport stops are within walking distance and in general parking options are removed (or significantly reduced) to free up public space. As will be discussed further below, this creates opportunities for synergies with other measures to ramp up development of cycling paths, pedestrian walkways, leisure areas and promotion of public transport.

The targeted stakeholders for these measures are all residents in areas where superblocks are implemented, who will be incentivised to rely more on alternative transport modes rather than private cars.

2.2.6.2 Geographic scope

Superblock models have been explored in a variety of cities within EU Member States. Three significant examples are found in Spain (Barcelona), Austria (Vienna) and Germany (Berlin).

Barcelona:

The implementation of superblocks (*"Superilles"* in Catalan) in Barcelona began in 1993, in the El Born district. In 2005, additional superblocks were planned for the districts of Gràcia and Sants Montjuïc. Between 2016 and 2019, three more superblocks were implemented, in Poblenou (34,000 inhabitants in 2016), Sant Antoni (38,000 inhabitants in 2016), and Horta (27,000 inhabitants in 2016).⁵³ The current plan is to implement 503 superblocks across the entire city.

Vienna (Supergratzl): Pilot began in 2022 in the Favoriten district, featuring:

- Pavement painting/ planters – test an area affordably before implemented a permanent change
- Street furniture
- 62 new trees
- Water play areas

Key structural elements include diagonal filters, one-way systems, and greening/public space improvements. The pilot superblocks were introduced to Vienna in the 10th district, which is an outlying district and more than 200,000 residents. It is considered a working-class neighbourhood, where residents have a low average income by district standards. Car ownership rates are higher than in the 7th district.

The 7th district (Neubau) is located near the centre of Vienna, which is densely populated and covers a smaller area than district 10. The 7th district is an upper-middle class area where residents have higher incomes and residents here generally own fewer cars compared with other districts – residents are more accustomed to using alternative forms of mobility outside of cars. Residents here are more open to the introduction of a superblock in comparison with other areas.

The 17th district is the third area that Vienna have introduced a superblock, and this is a formerly industrial area. Now it is a middle-class residential district, with nearly 60,000 inhabitants and a high share of green urban space compared to the other districts. This area has the highest car ownership of the 3 districts.

Berlin:

Differently from the experience in Austria and Spain, the initiative to implement superblocks in Berlin was bottom-up, starting from residents who brought Kiezblocks in the political agenda. By November 2024, 36

⁵³ [The Superblock model: A review of an innovative urban model for sustainability, liveability, health and well-being - ScienceDirect](#)

Kiezblocks⁵⁴ were approved in district parliaments, with 72 initiatives enacted since 2020. The effective implementation of superblocks in Berlin is unclear, as Kiezblocks can be defined in different ways.

Berlin has incorporated modal filters and one-way streets under national traffic laws, to trial these zones.⁵⁵

2.2.6.3 *Rationale, intervention logic and addressed barriers*

Car-bound mobility is seen as one of the main causes of GHG emissions in cities. Current institutional structures tend to favour car-bound mobility and despite measures to support well-established public transport systems, many cities struggle to reduce car use and change the transport trajectory with an effective modal shift. To effectively reduce GHG emissions, further measures to reduce car-mobility infrastructure is necessary such as changes to the urban planning regime through the implementation of superblocks.

Superblocks are effective in reducing the space allocated to cars, encouraging the adoption of alternative modes of transport. More broadly, their implementation often requires the reorganisation of nearby public transport networks to provide a practical and convenient alternative to car use.

Impact of the measure

2.2.6.4 *Expected impacts*

Due to its cross-cutting nature, this policy has a wide range of impacts, including effects on mobility choices (modal shift), air quality, and overall well-being.

Modal shift:

Superblocks have been polemic in different cities, but gained popularity in recent times in some areas. There are only limited studies on the effects on modal shift due to the rather new measure. However, the Barcelona City Council estimated that the implementation of the 503 superblocks in the city would result in a 19.2% reduction in car usage, and translated public transport, cycling or walking.⁵⁶

A study conducted on the Austrian capital analysed the potential effects of implementing superblocks on modal shift. To do so, the authors first selected all neighbourhoods in the city that exhibited the three characteristics of an ideal superblock: good access to public transport, high population density, and a higher proportion of space dedicated to vehicles compared to that dedicated to pedestrians. The authors then estimated the effects on trips per day (categorised as walking, cycling, car use, and public transport) based on the implementation of varying numbers of superblocks with different configurations. The results show that car trips tend to decrease (modestly) as the number of superblocks increases, in favour of walking and the use of public transport. The effects on cycling trips, however, remain uncertain.⁵⁷

Co-benefits:

The co-benefits associated with the implementation of superblocks relate to environmental factors and residents' health. Specifically, a study on the case of Barcelona (assuming the implementation of 503 superblocks), estimates a reduction in pollution (NO₂), noise, and heat, due to the increase in green spaces replacing areas previously dedicated to cars. In addition, based on an increase in public transport use, cycling, and walking, using estimates provided by the Barcelona City Council⁵⁸, the researchers estimated that 667 premature deaths could be avoided each year.⁵⁹

2.2.6.5 *Scalability*

The potential scalability of superblocks depends on a number of factors, both technical and social. In some cases, certain urban layouts (e.g. the grid-like system of Barcelona) are more conducive to the creation of superblocks. The presence of public transport networks capable of supporting increased demand is also essential to avoid friction with the population. In some instances, this requires greater public investment in transport infrastructure to increase capacity.

⁵⁴ Neologism created by the merger of *Superblocks* and *Kiez*, a colloquial German word used to refer to city neighbourhoods in Berlin.

⁵⁵ A map of "Kiezblock" called superblocks in Berlin (Initiatives, politically decided and already (partially) implemented superblocks can be found here: <https://www.kiezblocks.de/>

⁵⁶ [Changing the urban design of cities for health: The superblock model - ScienceDirect](#)

⁵⁷ [ITS European Congress 2023 Lisbon.pdf](#)

⁵⁸ Urban mobility plan of Barcelona PMU 2013-2018

⁵⁹ [The Superblock model: A review of an innovative urban model for sustainability, liveability, health and well-being - ScienceDirect](#)

The development plan for superblocks should also prioritise the implementation in areas where the effectiveness of superblock is maximised. For example, modelling suggests that superblocks in Vienna are up to 2-3 times more effective when implemented in more deprived areas compared to more affluent urban areas.

From a social perspective, the main challenge arises from the resistance that residents may show towards such changes, due to the perception of negative effects (such as reduced mobility or rising housing costs) that are not fully offset by the positive outcomes. A specific example illustrating the potential limits to scalability is the neighbourhood of Poblenou in Barcelona. In this neighbourhood, residents complained about their marginal role in the decision-making process, especially considering that the superblock project was announced during the summer vacation and executed in September, leaving no time for public discussion. Parking was mentioned as a key issue, along with difficulties related to the loading and unloading of goods for local businesses. Furthermore, it was highlighted that while superblocks may have positive effects on some streets (i.e., reduced noise and air pollution), residents on exterior roads (i.e., streets where traffic is not restricted) may face increased traffic levels and associated negative effects, such as noise and pollution, thereby creating disparities between residents.

Additionally, a significant concern among residents was the risk of gentrification resulting from the improved quality of life in the area. One possible solution to the social resistance that superblocks may provoke is to adopt a more inclusive decision-making process. A good example is the Berlin Kiezblocks model, where the development of superblocks was initiated by residents and then pushed onto the political agenda, giving local communities a central role in the planning process.

2.2.6.6 *Replicability*

There is a lot of potential for the superblock model to have an impact in reducing traffic and promoting decarbonisation in urban areas. Specifically, Member States with higher potential are those with higher urbanisation rates and where other measures to limit private vehicle use and promote public transport remain underutilised.

2.2.6.7 *Speed of implementation*

The measure can be implemented in the short term. The most time intensive phases of its development are the planning, consultation, and public participation. The latter two are essential, as they involve citizens in the decision-making process and help reduce resistance to the implementation of superblocks. During the planning, it must be ensured that the interests of other citizens are considered (e.g., those living in nearby neighbourhoods). Furthermore, the planning should consider the variety of stakeholders involved, and should grant access to local businesses, craftsmen, people with reduced mobility and emergency vehicles among others. In Barcelona, the consultation activity increased after the Poblenou experience, dedicating more time to involve citizens in the project and building support for the measure. Similarly, Kiezblocks in Berlin rely heavily on community engagement, which fosters support but slower rollout.

Once the project has been approved, the physical transformation of the areas requires a relatively short amount of time, depending on the availability of capacity to carry out the necessary works (such as the creation of green spaces, the development of community areas, and the expansion of complementary public transport services). In Vienna, the implementation of the Supergrätzl Favoriten will take approximately four years, with the pilot phase started in summer 2022. These four years include the entire planning, the implementation of diagonal filters for traffic reorganisation, and implementation of structural interventions. However, it was noted that the positive effects, in terms of traffic calming, were already evident after the first year of the pilot's implementation.⁶⁰

⁶⁰ [Superblocks between theory and practice: insights from an international e-Delphi process and urban I](#)

2.2.7 Case Study: Financial incentives for charging infrastructure for heavy-duty vehicles, including grid connection

Overview of the measure

2.2.7.1 Objectives and scope of the measure

The availability of charging infrastructure is one of the main challenges in the electrification of heavy goods transport. A recent study indicates that infrastructure for charging at the depot plays a significant role for electric trucks⁶¹. The cost of constructing these depot charging stations can vary significantly, with grid connection expenses representing a major cost driver. To support the expansion of charging infrastructure, several EU countries provide financial incentives to companies for the installation of charging points.

2.2.7.2 Geographic scope

Various Member States have implemented financial support for charging infrastructure, for example Germany, Spain, France and Italy. However, the French funding programme in particular addresses private charging infrastructure for heavy commercial vehicles and includes the grid connection.

Other member states, such as Spain with its MOVE III programme, are promoting both public and private charging infrastructure for passenger vehicles and freight transport.

The level of financial support provided, as well as the criteria by which it is scaled, varies across countries. Support may differ depending on characteristics of the applicant or the specific type of charging point. In some cases, funding is limited to certain types of charging infrastructure for specific applications (e.g., public fast-charging stations for trucks), while in others, broader support is offered for both private and public charging infrastructure.

With the Advenir programme, France is subsidising charging infrastructure and the grid connection for the first 1,000 charging points in depots for municipalities or companies for heavy commercial vehicles of vehicle classes N2 or N3 and heavy vehicles for passenger transport. These are subsidies for the infrastructure and the grid connection of the depot.

The subsidy amount for the charging infrastructure is 50 % of the net costs for the delivery and installation of the subsidised charging points, with an upper limit of between €2,200 per charging point 12-43 kW AC and €15,000 for DC charging points over 140 kW, depending on the charging power.

For charging infrastructure over 500 kVA, additional funding can be provided for other components such as the grid connection. Depending on the connected power, this funding ranges between €100,000 for connections with ≥ 500 kVA and €960,000 (excluding VAT) for connections $\geq 8,000$ kVA.

In Spain, the MOVE III⁶² program supports the adoption of electric mobility. Initially endowed with €400 million, the program's budget was later increased to €1.55 billion. One key component of MOVE III is financial support for companies and public institutions in the development of both private and public charging infrastructure. This includes all necessary electrical components such as grid connections and transformers. Depending on company size and charging capacity, between 20% and 50% of costs are covered, with higher support levels available for smaller enterprises and higher-capacity chargers. By the end of 2023, a total of 99,700 charging points had been financed under the program, which may also have included charging infrastructure for heavy goods vehicles.⁶³

2.2.7.3 Rationale, intervention logic and addressed barriers

The availability of public and private charging infrastructure remains one of the key challenges for the decarbonization of the transport sector.

The costs associated with building charging stations are highly variable, with grid connection expenses often representing a significant portion of the total investment. To support the expansion of charging infrastructure, several countries offer financial incentives to companies for the installation of charging points.

These financial incentives serve two main purposes: Firstly, they help companies advance the electrification of their own vehicle fleets by alleviating the high upfront investment required to install private charging infrastructure. Secondly, they reduce the financial risk associated with building and operating public charging

⁶¹ https://www.oeko.de/fileadmin/oekodoc/TE_truck-depot-charging.pdf

⁶² <https://www.idae.es/ayudas-y-financiacion/para-movilidad-y-vehiculos/programa-moves-iii>

⁶³ <https://evtcp.org/country/spain/>

stations, thereby improving the business case encouraging private investment in publicly accessible infrastructure. This, in turn, improves the overall availability of charging stations, making the use of electric vehicles more practical and reliable by reducing concerns about access to mid-journey charging options. Moreover, enhanced financial support for small businesses ensures that the entire market is included in the transition.

By offering proportionally higher subsidies to smaller enterprises, the measures help mitigate the relatively greater financial burden these companies face when investing in charging infrastructure.

Impact of the measure

2.2.7.4 Expected impacts

This measure is intended to increase the number private depot-charging stations, thereby creating stronger incentives to purchase and use electric vehicles.

By January 2025, the French Advenir programme had provided €5.1 million in funding for 972 charging points at transport depots for heavy-duty vehicles, as well as 24 additional charging points that were publicly accessible to trucks⁶⁴.

In Spain, €971.79 million has already been used within the MOVE III program to fund 104,048 electric vehicles and 99,700 charging points. However, the programme is not specifically aimed at heavy commercial vehicles⁶⁵.

Funding the charging infrastructure and in particular the grid connection in depots with large fleets that require high connection capacities requires considerable public investment.

Moreover, the cost of installing charging infrastructure is only part of the challenge. Fast permitting procedures, sufficient available space, affordable electricity prices, and access to a strong, reliable grid are also crucial. Finally, the deployment of this infrastructure must go hand in hand with the availability of electric trucks that can make use of it.

Third-party transport companies could benefit directly from the funding if funded companies allow others to use their charging infrastructure as semi-private or semi-public charging infrastructure in large industrial and logistics centres.

2.2.7.5 Scalability

In France, only 1,000 charging points were funded, covering heavy-duty vehicles for goods as well as passenger transport. The average funding of just over €5,000 per charging point indicates that small infrastructure without large network connections was mostly funded. This suggests that there is a possibility of scaling up the programme with the same range of stakeholders.

In Spain, a wide range of stakeholder groups are eligible for funding, including individuals and self-employed persons, homeowner associations, legal entities incorporated in Spain, industrial estate conservation entities, and agricultural transformation companies.

Projects in other countries can also be more regionally focused, with funding limited to specific areas. However, the scalability of these measures largely depends on the availability of financial resources, as such initiatives require significant public investment and should include accompanying measures such as a simplified application process and provision of information for grid connections.

Simple application procedures that do not involve complex and time-consuming tenders should be implemented to reach SMEs. More detail on this activity is included in section 2.6.

2.2.7.6 Replicability

The subsidisation of charging infrastructure construction is a measure that can be applied across all EU Member States. The key factors for successful implementation are the availability of sufficient financial resources and the presence of the necessary technical conditions within regional and national energy grids. A sufficiently high level of support is essential to ensure the effectiveness of the measure, particularly in enabling smaller companies—often deterred by high upfront investment costs—to participate in the transition.

Practicalities around implementation of the measure

⁶⁴ <https://www.ecologie.gouv.fr/presse/electrification-poids-lourds>

⁶⁵ <https://evtcp.org/country/spain/MOVE>

2.2.7.7 *Speed of implementation*

Depending on the complexity of the program and the administrative structures in place, implementation can proceed very quickly or take significantly longer. In cases where rapid implementation is required, simpler programs can be organized within a few months, while more complex schemes may take several years. The more institutional experience available, the faster the process tends to be. In Spain, the implementation timeline was relatively short, with funding already made available by the end of 2023 after the decision was made in April 2021⁶⁶.

However, the application for and realisation of grid connections can take several years in individual member states⁶⁷. For this reason, not only should such measures be implemented quickly, but communication between transport companies and grid operators should also be standardised and accelerated.

2.2.8 Case Study: Streamlining and harmonising administrative processes for grid connections

Overview of the measure

2.2.8.1 *Objectives and scope of the measure*

Streamlining and harmonising administrative processes for grid connections are crucial for quicker setup of charging infrastructure for electric vehicles. The aim of this package of measures is to simplify grid connection and permitting processes to ensure timely approval and implementation of infrastructure development for EVs, which in turn incentivises private investment in charge points. This includes setting clear timelines for connection requests and simplifying application processes.

The measures for streamlining and harmonising administrative processes help to:

- Accelerate the roll-out of EV charging
- Increase collaboration between key electricity network actors
- Increase knowledge and understanding of EV infrastructure procedure from transport and energy sectors.

The targeted stakeholders for the measure include Distribution network operators (DNOs) and independent distribution network operators (IDNOs), local authorities, the market regulator (OFGEM) and wider government. However, the main beneficiaries are charging point operators (CPOs), EV owners and private investors in charging points.

2.2.8.2 *Geographic scope*

The Netherlands is taking action both on the demand-side and supply side of the grid in order to tackle grid congestion, with over 12,000 companies waiting for a new or expanded grid connection with up to 90% of Dutch businesses experiencing direct or indirect consequences of grid congestion. In coordination with grid operators, regulators and market stakeholders, is working on more than 100 targeted actions to address congestion and avoid a systemic failure. The measures are focussed around 3 key principles:

1. **Sneller Bouwen (Faster Construction):** accelerating the expansion of infrastructure through innovation, streamlined procedures and multi-level collaboration.
2. **Beter Benutten (Better Utilisation):** includes new flexible contracts for large users, optimised use of existing networks and shared grid access agreements.
3. **Slimmer Inzicht (Smarter Insight):** focuses on capacity maps, digital tools and data-driven planning to prioritise investments.⁶⁸

In the UK workshops have been held with key stakeholders such as CPOs and DNOs to take several steps to streamline and harmonise administrative processes for grid connections. These include:

1. DNOs providing clear guidance on next steps and communicating with customers, particularly when giving milestone updates on progress toward energisation after a connection offer has been accepted and a timeframe for energisation is provided. DNOs must also outline key areas which may lead to delays in energisation of a ChargePoint.

⁶⁶ <https://evtcp.org/country/spain/>

⁶⁷ https://www.oeko.de/fileadmin/oekodoc/TE_truck-depot-charging.pdf

⁶⁸ [Businesses on a waiting list for power: The Netherlands launches 100 measures to ease grid congestion - Strategic Energy Europe](#)

2. Where local authorities and CPOs are operating across DNO boundaries and need approvals from multiple DNOs, DNOs should hold joint, cross-boundary surgeries to simplify the work on these projects.
 3. DNOs collaborating through the Electricity Networks Association to create a single information portal containing weblinks, documentation and other information / checklists relevant and helpful to connection applicants to navigate DNO application processes.
- DNOs allowing independent connection providers to carry out design work for ChargePoint installation and providing consistent approaches to the procedure of allowing this to take place. Contestable design works include the installation of cables, substations and other plants associated with the new connection.⁶⁹

2.2.8.3 *Rationale, intervention logic and addressed barriers*

When a ChargePoint is installed, it is connected to the electricity grid. Power to the charging device then needs to be switched on by the DNO. Energisation takes place only after all civil works and wider reinforcement works have taken place by the CPO. However, when infrastructure installations are complete there is often backlogs as well as longer payback periods for CPO operators who cannot generate revenue while they await energisation. Increasing transparency on energisation timeframes and providing guidance to customers on next steps to customers should alleviate these information issues.

Creating a centralised information portal for grid application support should remove inconsistencies in offers from multiple DNOs. This will speed up the delivery of connection application processes through a reduction in application errors and duplications from CPOs, which in turn will alleviate resource demands on DNOs through minimal feedback with applicants, ultimately resulting in lower costs and time saved.

Finally, allowing independent connection providers to carry out contestable works on design and implementation of ChargePoint's will reduce the delivery time for connection requests to be actioned.^{Error!}

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Impact of the measure

2.2.8.4 *Expected impacts*

Increasing transparency on energisation timeframes and providing guidance to customers on next steps to customers should alleviate informational issues. They will have a direct impact on the consumers who are waiting for a ChargePoint to be available which benefits all current and prospective EV owners. Increased transparency and clarity of process of energisation will also positively impact the relationship between CPOs and DNOs. Finally, it will ensure that CPOs know when their assets will be generating revenue and will allow them to plan future investments. It secures their investments and allows for effective planning of national charging networks on a larger scale. The long-term goal should be to transition to a market-led deployment strategy, creating a secure environment for private investment will ensure that infrastructure development is sustainable without continuous public financial support⁷⁰. This measure can be combined with measures targeting transparency around grid limitations and opportunities.

Allowing independent connection providers the opportunity to carry out contestable works and push through grid connection requests is estimated to reduce delivery time by up to 2 months in the UK. The energy regulator in the UK encourages competition where it can improve access for customers connecting to the network and promote fairer prices and better service.

In terms of cost, there will be a significant burden on DNOs initially, which may create resourcing issues in an area that is already strained. There is no statistical data on the impact of this package of measures as they are due to be implemented by summer 2025. However, the package of measures aims to expand collaboration between the energy and transport sectors, allowing government and industry to deliver over 70,000 public EV charge points in the UK and over 680,000 domestic charge points in England alone^{Error! Bookmark not defined.}.

The impact of the measure can also be affected by the supply-side. Congestion in the grid has serious implications for economies and societies by delaying connections to the electricity network and therefore hindering important initiatives such as housing projects and industrial development. In the Netherlands, these

⁶⁹ [Improving the grid connection process for electric vehicle charging infrastructure - GOV.UK](#)

⁷⁰ [EU faces challenges in implementing HDV charging network by 2030 | EVBoosters](#)

disruptions have affected expansion plans, renewable energy project development, and the electrification of fleets and industrial processes.⁷¹ The risk of improving permitting times, procedures and connection with the grid on the demand-side means that attention also needs to be put simultaneously onto measures for the supply-side of energy into the grid to ensure there is enough capacity for future connections of ChargePoint's.

The Netherlands are reducing stress on their national grid through a number of measures including:

- **Congestion management:** Electricity producers or consumers, in exchange for compensation, reduce the load on the grid by temporarily reducing feed-in or offtake during peak periods to create flexibility.
- **Alternative contract forms:** Grid users can be connecting with a contract that doesn't provide 24/7 transmission capacity. This allows more grid users to be connected. This is in collaboration with grid operators and the Netherlands Authority for Consumers and Markets (ACM). Rollout is in its early phase.
- **Rates:** Adjustments to the tariff structure create financial incentives to off-peak times.
- **Queues/ prioritisation:** Grid users who cannot secure transmission capacity are placed on a waiting list. Initiatives are being developed to improve the design of these waiting lists, creating space and prioritising parties with high social value.⁷²

2.2.8.5 Scalability

The mapping and clear administration procedures for connecting to the energy grid will benefit CPOs, however such transparency would also help other sectors, such as energy suppliers (citizens and other enterprises) with enabling fast connection to the grid.

The Netherlands has Grid Management capacity maps, which are continuously expanded based on stakeholder feedback. A map layer from TenneT has been added, providing users with insight into congestion, queues, and available capacity at higher grid levels. This also clarifies which grid level is experiencing congestion. Furthermore, all planned grid expansions per supply area have been added. This allows users to see where and when these expansions will take place. This can allow investors in ChargePoint's to plan their future investments accordingly. The expected completion date of grid expansions in a specific area has recently been added to the maps. This provides an indication of when transmission capacity can be offered to customers again in a given supply area.

Another product implemented by the Netherlands to increase transparency, include the LAN Dashboard. This dashboard provides quantitative insight into the realization of connections, queues, flexible contracts, and the realisation of low-voltage and medium-voltage cables and medium-voltage substations.⁷³

2.2.8.6 Replicability

Harmonising measures should be achievable in some format across all MS. Streamlining administrative processes for grid connections, such as clear timelines for connection requests and streamlining connection application procedures would help secure market led investment for charging infrastructure.

Practicalities around implementation of the measure

2.2.8.7 Speed of implementation

The process should be relatively quick; however, the structure of the energy market will affect outcomes and cooperation of DNOs, and Transmission System Operators (TSOs) is required. Nuances in certain MS and the capacity to take part in workshops to identify the best approaches for streamlining administrative processes may take time to arrange.

2.2.9 Case Study: Eurovignette – Truck tolling in favour of ZE Heavy Duty Vehicles (HDVs).

Overview of the measure

⁷¹ [Grid congestion is posing challenges for energy security and transitions – Analysis - IEA](#)

⁷² [Tweede Voortgangsrapportage Landelijk Actieprogramma Netcongestie | Rapport | Rijksoverheid.nl](#)

⁷³ Ibid.

2.2.9.1 Objectives and scope of the measure

This measure reduces the kilometre-based toll for zero-emission (ZE) heavy-duty vehicles (HDVs) compared to those with internal combustion engines (ICEVs).

The Eurovignette Directive provides the legal framework. Accordingly, a km-based toll can consist of various components. The infrastructure charge, a charge levied for the purpose of recovering the construction, maintenance, operation and development costs related to infrastructure incurred, and the external-cost charge for CO₂-emissions are relevant for this measure.

The requirements from the Eurovignette Directive leave room for flexibility as to how strongly ZE HDVs are favoured in a kilometre-based truck toll.

ZE HDVs can be exempted from tolls until 31 December 2025⁷⁴. After that, a discount of between 50% and 75% can be applied to the infrastructure charge. With regard to the second relevant component, the external cost charge for CO₂ emissions, there is flexibility in that up to twice the listed reference values of the external cost charge for CO₂ emissions can be levied (in addition to the CO₂ based variation of the infrastructure charge). Since ZEVs are not subject to an external cost charge for CO₂ emissions, this increases the cost advantage of ZEVs over ICEVs.⁷⁵

The targeted stakeholders are operators of heavy goods vehicles. Germany is currently the only country maxing out the possible discount for ZEVs. In Germany, the toll applies to all commercial vehicles with a technically permissible maximum laden mass (TPMLM) over 3.5 tonnes, on motorways and federal highways. The toll rates are differentiated based on the vehicle's weight, pollutant emissions, and, since December 2023, CO₂ emissions.

2.2.9.2 Geographic scope

A kilometre-based toll for heavy-duty vehicles has been introduced in a number of Member States⁷⁶ (AT, BE, CZ, DE, DK, EE, HU) and is planned in others (NL). Germany is currently the only Member State that has implemented the maximum possible discount for ZE-HDVs.

2.2.9.3 Rationale, intervention logic and addressed barriers

Both approaches, the CO₂ component and the discount for ZEs, are aimed at reducing or offsetting the current Total Cost of Ownership (TCO) disadvantage of ZEVs compared to vehicles with internal combustion engines. The CO₂ component ensures that external costs are internalised, making trucks with combustion engines more expensive to operate. The (partial) exemption of ZEs on the kilometre-based component ensures that they become cheaper. The greatest effect is achieved when both approaches are combined. As a result, ZEs, which are currently still more expensive to purchase, will become increasingly economical to operate up to a level that the total cost of ownership becomes lower than conventional vehicles.

Impact of the measure

2.2.9.4 Expected impacts

For countries with an existing kilometre-based toll system, the CO₂ component increases total revenue that can be reinvested in the decarbonisation of road transport. The rebate for electric vehicles, on the other hand, may reduce the total amount of toll collected as the proportion of these vehicles increases, if a Member States does not raise toll on conventional vehicles to compensate the loss in revenues.

For operators of ZE-trucks, the discount compared to a EURO 6 (CO₂ emission class 1, >18 t, 5 axles, toll rate 34.8 €/ct/km)⁷⁷ would result in cost savings of almost €35,000 in 2025 and over €26,000 thereafter, assuming 100,000 km per year on German toll roads. As the toll only applies to motorways and trunk roads, the measure will affect long-distance journeys more than urban and regional transport.

⁷⁴ A Commission proposal of June 2025 aims at extending the optional exemption of ZE HDV from road charges until 2031.

⁷⁵ However, the maximum external-cost charge for CO₂-emissions, which can be applied by Member States, will have to be limited by 1 January 2027 through Delegated Acts, taking into account the (partial) internalisation of such external costs through ETS2 (Article 7cb(4) of the Eurovignette Directive). This means that depending on the effective carbon prices resulting from ETS2, little or no leeway for applying external-cost charges for CO₂-emissions will be left for Member States.

⁷⁶ <https://www.ecgassociation.eu/wp-content/uploads/2024/08/Eurovignette.pdf>

⁷⁷ https://www.toll-collect.de/static/media/tc/informationen_tc/tarife_vergleichstabelle_2023_2024/mautsaetze_07_2024_vergleich_d.pdf

While ZE-truck operators will be relieved, operators of conventional trucks will face additional costs due to a high CO₂ price component. These costs could be passed on to shippers through higher freight rates⁷⁸.

2.2.9.5 Scalability

The good practice focuses specifically on lorries. However, the measure could also be applied to other vehicle users for passenger and freight transport across different vehicle categories. In the Czech Republic, for example, there is a toll for M2 and M3 buses.

2.2.9.6 Replicability

The measure will likely have a greater impact in MS with more toll roads, and in MS with a large share of heavy long-distance road freight transport, transit traffic and port hinterland traffic. The tolls will be easier to implement in countries that already have distance-based tolling in place. Concessions in other countries also effect the replicability of new tolls.

By March 2024, Member States had to vary vehicle tolls according to CO₂ emissions. By 2026, 13 Member States are expected to have distance-based tolls and 4 Member States time-based tolls that vary according to CO₂. This means that Member States accounting for 62% of the EU's transport activity measured in tonne-kilometres will have an incentive to switch to zero emission vehicles (ZEVs).⁷⁹

Practicalities around implementation of the measure

2.2.9.7 Speed of implementation

For Member States that have already implemented a kilometre-based toll system, a stronger incentivisation of ZE trucks should be possible, and implemented comparatively easily with respect to Member States with no system in place. There should be significant additional major costs through new technical components or newly developed systems.

For other member states, the introduction may involve considerable time and effort: A tolling mechanism takes 1–3 years to implement, involving legal approvals, infrastructure development, and payment systems. Planning includes fee structures, enforcement, and technology integration.

2.3 BUILDINGS

This section presents the 7 best practice case studies developed to promote decarbonisation of the buildings sector.

2.3.1 Case Study: Acting to reduce electricity prices for specific technologies (e.g. heat pumps)

Overview of the measure

2.3.1.1 Objectives and scope of the measure

The reduction in heating costs by switching to heat pumps is often limited, e.g. due to high electricity costs in comparison with fossil fuel heating (called the electricity-to-gas price ratio). This means that the high initial investment only pays for itself after a long time. This is one of the main barriers to the acquisition of heat pumps.⁸⁰

There are two main design options:

- Reduced VAT on electricity used in heat pumps. The VAT-reduction is usually applied directly by the energy supplier on the bill, reduced energy taxation: The Energy Taxation Directive, whose proposed revision under the European Green Deal is currently under discussion in the Council, leaves considerable flexibility for Member States to design their energy taxation systems. Any MS can ask, under certain

⁷⁸ https://bmdv.bund.de/SharedDocs/DE/Anlage/G/MKS-Wissenschaftliche-Untersuchungen/studie-anteil-transportkosten.pdf?__blob=publicationFile

⁷⁹ https://www.transportenvironment.org/uploads/files/202403_TE_Eurovignette_briefing_update.pdf

⁸⁰ KfW (2025): Heat pumps are gaining ground in Europe – electricity prices matter <https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-englische-Dateien/Fokus-2025-EN/Focus-No.-487-February-2025-Heat-pumps.pdf>

conditions, the Council to authorise further exemptions or reductions of the rates of taxation for specific policy considerations, and

- Flexible Tariffs for heat pumps: Regulation & standards.

Target stakeholders of the measure are building owners.

2.3.1.2 Geographic scope

Reduced VAT on electricity used in heat pumps applies in some MS, in combination with a reduced VAT on heat pumps (covered in section 2.3.7) or without combination.

- In combination with a reduced VAT on heat pumps in BE, GR, IE, IT, LU.⁸¹
- Not in combination with a reduced VAT on heat pumps: HR, MT, ES.⁸²

An example for reduced energy taxation comes from Finland: Council Implementing Decision (EU) 2022/1004 of 17 June 2022 authorised Finland to apply a reduced rate of taxation to electricity supplied to certain heat pumps, electric boilers and recirculating water pumps, in accordance with Article 19 of Directive 2003/96/EC (OJ L 168, 27.6.2022, p. 84)⁸³

Time-of-Use (ToU) Tariffs for heat pumps are for example available in Ireland⁸⁴ and Spain.⁸⁵ Historically, Germany offered time-of-use tariffs with reduced electricity rates during off-peak hours at night to promote heat pump adoption.

2.3.1.3 Rationale, intervention logic and addressed barriers

Reducing electricity prices allows consumers to achieve cost savings by reducing running costs of their new heating system (particularly relative to the old system which likely ran on gas). Reduced VAT on electricity and reduced energy taxation on electricity used by heat pumps (or potentially other technologies) directly reduces electricity prices, therefore resulting in cost savings which reduce the time needed to pay off the investment.

The second option is to implement flexible electricity tariffs for the use in heat pumps. There are different types of flexible electricity tariffs, including dynamic tariffs and time-of-use tariffs. With dynamic tariffs the electricity price is based on the current exchange price, which can vary hourly or even by the minute. With time-of-day tariffs there are different prices for different times of day, e.g. a higher day-price and a lower night-price.

Technical and regulatory requirements are necessary for the introduction of flexible tariffs. Legislation must allow variable tariffs. A technical prerequisite for the introduction of dynamic tariffs is the installation of smart meters, which record electricity consumption in real time and transmit the data to the supplier. In addition, the suppliers must be able to process this data and adjust the tariffs accordingly. For time-of-use tariffs, the building requires two meters, one for the heat pump and one for all other electricity consumption. The meter for the heat pump must be a dual-tariff electricity meter. The existence of variable tariffs is another prerequisite.

The introduction of flexible electricity tariffs enables consumers to benefit from price fluctuations and optimize their electricity consumption. At the same time, suppliers can better manage the load on the grid and improve the integration of renewable energies. Owners of heat pumps are able to reduce energy costs by using cheaper off-peak electricity, often from renewables. This can be achieved, for example, by using low-cost electricity to heat buffer storage tanks⁸⁶. In addition, through their smart operation heat pumps can capture value in balancing generation and demand and in managing network congestion, especially on the distribution grid⁸⁷.

This lowers both expenses and carbon emissions while helping to offset initial investment costs. Heat pump and electric heating system owners can maximise savings by increasing output when electricity is cheapest, providing an opportunity for cost savings. These savings should reduce the payback time of the initial investment. Energy management Systems can also facilitate automatic adjustment of energy usage. These

⁸¹ <https://www.ehpa.org/news-and-resources/publications/vat-on-heat-pumps-and-electricity-in-europe/>

⁸² Ibid.

⁸³ https://www.eumonitor.eu/9353000/1/j4nvhdhdk3hydztq_j9vvik7m1c3gyxp/vlt3gmeuhiuo

⁸⁴ <https://www.electricireland.ie/residential/electricity-and-gas/heat-pump-price-plans>

⁸⁵ <https://evergreen-electrica.com/electricity-tariffs-spain?lang=en>

⁸⁶ <https://link.springer.com/article/10.1007/s12053-024-10206-z>

⁸⁷ Smart heat pumps need to be “aware” of and, without user interference, respond to signals from the grid and/or a local PV system, allow for remote and/or automatic control and interact with home energy management systems and the grid via appropriate communication interfaces. This is why the Commission has launched a Code of Conduct for the interoperability of several smart appliances, including heat pumps, establishing the minimum information that needs to be exchanged

measures encourage consumers to shift energy usage to times when renewable energy supply is abundant and prices are lower, promoting grid stability and efficient energy use. In addition, they encourage uptake of renewable heating technologies by providing a mechanism for cost savings to pay off the initial investment.

Starting January 1, 2025, all electricity providers are mandated to offer dynamic tariffs reflecting real-time market prices, enabling consumers to optimise energy usage and costs, according to the Directive (EU) 2019/944 on common rules for the internal market for electricity.

The full implementation of the Electricity Directive will already ensure availability of dynamic price contracts and aggregation services to enable participation of heat pumps in demand response, the right for a smart meter and the right to a separate supply contract for heat pumps. The reform of the electricity market design strengthens the role of flexibility services, demand response and energy storage in the electricity system. It requires Member States to assess the power system needs in terms of flexibility - be it hourly, daily, weekly or seasonal – and to establish indicative objectives for storage and demand response, making demand response and storage key non-fossil flexibility sources to enable the integration of higher levels of variable renewables. On this basis, Member States can introduce new support schemes in the form of capacity payments for flexibility sources such as demand response and storage. Importantly, the reform tackles the use of flexibility services by system operators, providing for further incentives to use flexibility services as an alternative and complement to grid development.

2.3.1.4 *Expected impacts*

Reduced VAT and energy taxation rates result in lower tax revenues, representing a fiscal investment in promoting renewable energy adoption. While upfront costs remain, operational savings from dynamic tariffs and reduced VAT and energy taxes can improve the economic feasibility of renewable heating systems over time, in particular in conjunction with valorising flexibility.

Countries with cheap electricity compared to gas have more heat pumps.⁸⁸ Analysis proves that the electricity-to-gas price ratio correlates with sale of heat pumps in Europe. A reliable and rising carbon price and abolishing the extent of natural gas subsidies that translate to a higher gas price will further improve the price-performance ratio between heat pumps and gas heating systems in favour of heat pumps. Promotional instruments can further strengthen the sale of heat pumps, such as subsidies to the purchase price or reduced VAT rates, as well as technology promotion or installer training.

Another opportunity to reduce the cost of electricity prices for heat pumps relates to the installation of PV panels for self-consumption. Energy communities are included under the Renewable Energy Directive⁸⁹, and help to support members produce and share their own energy through activities such as renewable self-consumption. Other policies to promote the installation of PV panels help consumers to balance the additional cost of high electricity prices with respect to gas and promote cheap renewable electricity consumption for heat pumps.

2.3.1.5 *Scalability*

Reduced VAT and energy taxation on electricity used by heat pumps should be easily scalable.

Dynamic tariffs can be scaled across different Member States, provided there is investment in necessary infrastructure like smart meters and supportive policy environments. The scalability depends on the readiness of energy markets to handle dynamic pricing models and the capacity of consumers to adapt to new pricing structures.

The spread of smart meters varies across Europe. Spain, for example, was the first country in the EU to reach full smart meter deployment, achieving 100% coverage as early as 2018 following a government mandate. Sweden has also completed its initial rollout and is now upgrading its infrastructure—275,000 smart meters are set to be replaced with newer models by the end of 2024, as required by national legislation. Finland is preparing a similar upgrade to adopt more advanced devices. In Germany, on the other hand, the rollout of

⁸⁸ KfW (2025): Heat pumps are gaining ground in Europe – electricity prices matter
<https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-englische-Dateien/Fokus-2025-EN/Fokus-No.-487-February-2025-Heat-pumps.pdf>

⁸⁹ [Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex](#)

smart meters has been slow: by the end of 2022, only around 500,000 devices had been installed—just 1.2% of the country's 41 million households.⁹⁰

As smart meter adoption expands, the implementation of dynamic electricity pricing becomes increasingly viable. The EU directive on "Dynamic electricity price contracts" (Directive 2024/1711/EC⁹¹) mandates that Member States incorporate dynamic pricing models into national legislation by 2025. Spain and Italy are already ahead in this regard—Spain, for instance, has time-of-use (TOU) tariffs as the default option, with nearly 40% of households using them. In Spain heat pump electricity tariffs often provide reduced rates during colder months to support energy-efficient heating.⁹² In Scandinavia, despite the widespread availability of smart meters, the energy market is shaped by seasonal variability. As a result, pricing is typically based on monthly variable tariffs. In Germany, only limited options currently exist, but by 2025, all electricity providers will be required to offer both variable and dynamic pricing models. Additionally, time-off-use-based grid tariffs are also set to be introduced in some countries.⁹³

2.3.1.6 Replicability

Other countries can adopt VAT reductions and request approval of reduced rates of taxation to electricity supplied to efficient heat pumps in accordance with Article 19 of Directive 2003/96/EC.

Dynamic Tariffs can be adopted as long as the Member States meet the technical requirements, e.g. smart meters, tailoring them to local market conditions and regulatory frameworks. The success of replicating dynamic tariffs depends on the existing technological infrastructure and the ability to deploy smart metering solutions.

Countries still heavily reliant on gas or oil heating could implement similar mandates to accelerate the transition to renewables. However, the pace of implementation would depend on whether affordable alternative heating systems (heat pumps, district heating) are readily available to be installed, which may not be the case in countries where there is significant skills scarcity. In countries with weaker regulatory enforcement, it may be difficult to enforce compliance.

2.3.1.7 Speed of implementation

Implementing reduced VAT-rates must be regulated by national legislation; MS can request reduced rates of taxation to electricity supplied to efficient heat pumps in accordance with Article 19 of Directive 2003/96/EC. Once implemented, reduced VAT and energy taxation rates can provide immediate financial relief to consumers investing in renewable heating systems.

Implementing dynamic tariffs requires time for regulatory changes, infrastructure upgrades, and consumer education.

2.3.2 Case Study: On-bill financing

Overview of the measure

2.3.2.1 Objectives and scope of the measure

On-bill financing is a mechanism designed to support energy efficiency renovations in buildings by enabling homeowners or tenants to repay renovation costs through their regular energy bills. The recast EPBD encourages the development of such schemes⁹⁴. A utility or private investor supplies capital to fund energy efficiency (and/or renewable energy) measures in buildings, which is repaid by the owner or tenant of the

⁹⁰ <https://navitasoft.com/en/news/new-dynamic-energy-pricing-flexible-electricity-tariffs>

⁹¹ https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401711

⁹² <https://evergreen-electrica.com/electricity-tariffs-spain?lang=en>

⁹³ <https://navitasoft.com/en/news/new-dynamic-energy-pricing-flexible-electricity-tariffs>

⁹⁴ Article 17(7): 7. To support the mobilisation of investments, Member States shall promote the effective development and use of enabling funding and financial tools, such as energy efficiency loans and mortgages for building renovation, energy performance contracting, pay-as-you-save financial schemes, fiscal incentives, for example reduced tax rates on renovation works and materials, on-tax schemes, on-bill schemes, guarantee funds, funds targeting deep renovations, funds targeting renovations with a significant minimum threshold of targeted energy savings and mortgage portfolio standards. They shall guide investments into an energy-efficient public building stock, in There are two main design types: on-bill loans, where the customer is the borrower, and on-bill tariffs, where the debt is tied to the meter or property, not the individual. In on-bill tariff models, repayment obligations transfer to the next occupant if the property is sold or rented, making long-term investments more appealing. Utilities or third parties (banks, public funds) may act as the lender; utilities typically collect the repayments via their billing systems. line with Eurostat guidance on the recording of energy performance contracts in government accounts.

building through regular payments on an existing utility bill. This financial mechanism spreads the repayment over time and avoids the need for upfront payments. The energy savings achieved from the renovation offset part or all of the repayment costs, so ideally, the user's total monthly costs remain stable or even decrease.

Design types can be grouped in two categories⁹⁵: On-Bill Financing (OBF), funded directly by utilities, and On-Bill Repayment (OBR), which involves third-party financial institutions. Other design features include On-Bill loans, where the customer is the borrower and On-Bill tariffs, where the debt is tied to the meter or property, not the individual. In on-bill tariff models, repayment obligations transfer to the next occupant if the property is sold or rented, making long-term investments more appealing. Utilities or third parties (banks, public funds) may act as the lender; utilities typically collect the repayments via their billing systems. There is a need for an adaptive scheme design tailored to the regulatory context and the specific characteristics of the specific country and the target groups.

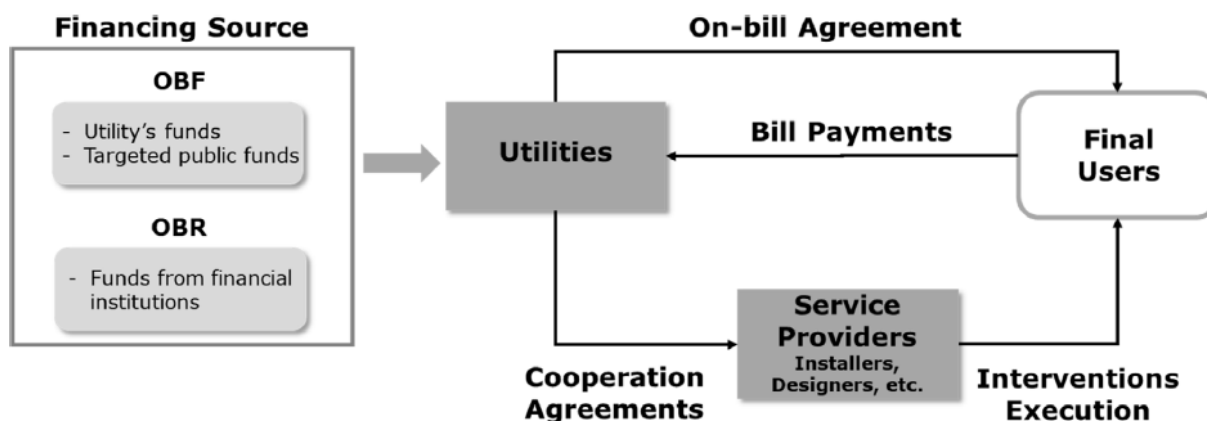


Figure: Basis sketch of an on-bill scheme [taken unchanged from Bianco & Sonvilla 2021, p. 4.301]

2.3.2.2 Geographic scope

There are several cases of on-bill financing across EU Member States, including FR, IT, NL, ES, LT (pilot phases). An expansion of these cases is included in the following sub-sections.

2.3.2.3 Rationale, intervention logic and addressed barriers

This measure avoids high upfront costs and reduces the impact of long payback periods, because repayments are made through the existing energy bill and are typically covered by the savings achieved. Additionally, tying the loan to the property rather than the individual addresses concerns about long payback periods, making renovations more appealing even if the homeowner plans to move.^{96 97}

Successful examples of on-bill financing models come primarily from the USA. One example is 'pay as you save (PAYS®)', which is available in various federal states. This corresponds to the classic design of on-bill financing: the energy supplier finances efficiency measures (e.g. thermal insulation, heat pumps, energy efficiency measures) and the repayment is made via the monthly gas or electricity bill. The payments are structured in such a way that they do not exceed the energy costs saved. The repayment obligation is linked to the meter, not to the person.⁹⁸

There are few examples from Member States:

Energie Sprong (NL)

Energie Sprong is an initiative under which energy renovations are carried out, such that a home produces as much energy as it consumes. Prefabricated materials are used, allowing the renovations to be delivered at pace, with full renovations possible in less than ten days. The initiative began in the Netherlands but has since expanded to other countries, including France, Italy, and the United Kingdom. On-bill financing was a central element in the original conception of the model, particularly in the Netherlands, approximately between 2012 and 2017. Renovations used to be funded by the money saved over the following 30 years of energy bills, with

⁹⁵ <https://doi.org/10.1016/j.egy.2021.07.011>

⁹⁶ <https://energiesprong.org/>

⁹⁷ <https://build-up.ec.europa.eu/en/resources-and-tools/articles/eu-initiatives-financing-building-renovation>

⁹⁸ <https://www.cleanenergyworks.org/programs/pays/>

recipients paying a monthly fee equivalent to the difference between their previous and current energy bills. This meant that the measures were effectively implemented at zero cost to the consumer, as the payments were compensated by the energy savings. However, Energie Sprong currently no longer utilises on-bill financing – e.g. no direct repayment of refurbishment costs via the supplier's energy bill. Today, the financing approach has evolved, particularly in the direction of bundling investments and long-term rental or building contracts.⁹⁹

Sunshine-Project (LV)

In the “Sunshine Project”, on-bill financing was successfully implemented in Latvia in combination with energy-performance contracting. Energy performance contracting (EPC) represents a financing mechanism for capital-intensive energy efficiency measures. It enables the realisation of energy upgrades without upfront investment by financing the improvements through the cost savings they generate. Within an EPC framework, an external service provider - commonly referred to as an Energy Service Company (ESCO) - plans, implements, and monitors energy efficiency or renewable energy projects. The ESCO's remuneration is directly linked to the achieved performance: repayment occurs through the verified energy cost savings. This performance-based structure means that the ESCO only receives full payment if the projected savings are actually realised.

The Sunshine-project was a Horizon2020 funded project running from 1 March 2015 to 1 March 2018. The project was built upon an existing programme that is aimed at the deep retrofit of Multifamily Buildings (MFB) in Latvia.

Under the existing scheme, a private ESCO, called RenEsco, has renovated 15 typical soviet era apartment buildings using EPC. These buildings were old, overcrowded and of poor quality. They were typically heated through district heating. The focus of the investment was the building envelope, heat distribution pipes, heat control and energy management. RenEsco's business model used EPC as a tool for renovating the buildings, in combination with on-bill financing, i.e. the homeowner continues to pay the same amount, while the ESCO recovers the amount saved through the House Maintenance Company. EPC contracts are typically signed for 20 years. The homeowners got a modernized apartment, with an increased value by about 20% – 30% right after renovation and an extended lifetime of the building by 30 years.

Financing to RenEsco was provided by local commercial banks (60%) in combination with a third party guaranteed loan (40%) from the Dutch Housing Institute (guaranteed by the Dutch Housing Corporation) based on project cash flows. No other collateral was foreseen. Homeowners had an extraordinary payment discipline, with 97% of payments on time and 0% non-payment within 6 years after the renovations.^{Error! Bookmark not defined.} More recent figures are not available.

One of the challenges of the scheme was that the balance sheets of the ESCOs became increasingly burdened as the number of projects grew. This situation led to the establishment of the Sunshine project, under which a forfeiting fund - the Latvian Building Energy Efficiency Fund (LABEEF) - was created^{Error! Bookmark not defined.}. In this context, a *forfeiting agreement* for energy efficiency projects, such as energy performance contracting, allowed an ESCO to assign its future repayment claims (based on verified energy savings) to a bank or a fund. This arrangement provided the ESCO with immediate liquidity, eliminating the need to wait 10 to 20 years for full repayment.¹⁰⁰ After demonstrating the achieved energy savings - typically within one to two years - the forfeiting fund purchased the remaining receivables from the ESCO. This mechanism enabled the ESCO to free up its balance sheet and secure new loans, thereby facilitating the implementation of further projects. The forfeiting scheme thus played a crucial role in scaling up investment in building energy efficiency renovations.¹⁰¹

Ren-on-Bill-Project (ES, IT, DE, LT)

The EU-funded “Ren-on-Bill” project aimed to scale up investments towards deep energy renovations of residential buildings, while promoting the development and implementation of on-bill schemes based on cooperation with the financial institutions accepting repayment by drawing on utility bills. This method, successfully adopted in Canada and the United States, is expected to significantly lower default of payment rates and bring several benefits to the European building energy renovation market and its society.

⁹⁹ <https://www.energiesprong.de>

¹⁰⁰ [Forfaitierung • Definition | Gabler Wirtschaftslexikon](#)

¹⁰¹ http://citynvest.eu/?q=content/sunshine-3; http://citynvest.eu/sites/default/files/library-documents/Model%20SUNSHINE_final.pdf

According to the project's official website, RenOnBill aims to scale up investments in deep energy renovations of residential buildings by promoting the development and implementation of On-Bill Schemes (OBS). These financing models are based on close cooperation between energy utilities and financial institutions.

Specifically, the project seeks to:

- Analyse and define the residential building market context in order to enable the replication of suitable OBS across Europe;
- Engage key stakeholders through the establishment of national stakeholder platforms;
- Develop tools to address the financing demand in the residential renovation sector and provide a transparent methodology for assessing and bundling investments;
- Design and implement business models within three partner utilities by piloting On-Bill schemes;
- Leverage and disseminate key insights and outcomes to strengthen the EU-wide knowledge base on OBS and support policy development.

These objectives are structured around five strategic pillars, which collectively define the RenOnBill project methodology. The initiative is being implemented in four focus countries: Germany, Italy, Lithuania, and Spain - selected for their diverse regulatory and market conditions, allowing for comparative analysis and assessment of replication potential in various EU contexts.¹⁰² In 2022 a "European on-bill building renovation roadmap" was published within the project¹⁰³, describing barriers and solutions for the uptake – see there for further explanation.

Impact of the measure

2.3.2.4 Expected impacts, Scalability, Replicability

On-bill financing is increasingly seen as an effective instrument for promoting energy efficiency measures in Europe. However, the activities and projects described show that on-bill schemes are not easy to implement. In theory, these approaches represent an interesting method of overcoming financial barriers to energy-efficient refurbishment - so far it has mainly been implemented on a pilot scale. On-bill financing can, and should, be combined with grants or subsidies to further reduce costs and encourage comprehensive energy efficiency improvements. Further efforts and regional adaptations of the concept are needed to implement them successfully. In general, on-bill schemes are applicable to both residential and commercial properties, facilitating widespread adoption of energy efficiency measures.

There is political support at EU level through the European Energy Efficiency Financing Coalition.¹⁰⁴ It is not known if on-bill schemes materialised after the ren-on-bill-project on a national level.

Successful implementation and replicability depend on whether financing can be sourced. It also requires participation of energy companies, so a regulatory environment that supports this is necessary.

Practicalities around implementation of the measure

2.3.2.5 Speed of implementation

Despite great efforts, so far no Member State in Europe has got beyond the pilot scale. Further support is needed to successfully introduce on-bill schemes on a large scale.

2.3.3 Case Study: Information about heat pumps and tools

Overview of the measure

2.3.3.1 Objectives and scope of the measure

A lack of knowledge and misinformation about heat pumps, their efficiency and the suitability of the own building for the use of heat pumps is hampering the roll out of heat pumps¹⁰⁵.

¹⁰² <https://www.renonbill.eu>

¹⁰³ <https://www.bpie.eu/publication/european-on-bill-building-renovation-roadmap/>

¹⁰⁴ https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:C_202301553

¹⁰⁵ Expert interviews and webinar.

Information campaigns and tools to assess the suitability of heat pumps for your own building, possibly in combination with subsidies and reduced electricity prices, help to accelerate the roll-out of heat pumps.

2.3.3.2 Geographic scope

Several EU member states have launched targeted information campaigns in recent years to improve building owners' knowledge of heat pumps and thus increase the acceptance of this technology. These campaigns pursue various communication strategies - from online videos and print materials to events and advisory services - and aim to raise awareness of the technical, ecological and economic benefits of heat pumps.

In Germany, the Federal Environment Agency's information portal “So geht's mit Wärmepumpen!” (“This is how heat pumps work!”) presents best practices from existing buildings.¹⁰⁶ The nationwide campaign week “Heat Pump Week” in November 2024 was financed by the Ministry of Energy and Climate, organised by the German Energy Agency (dena), and implemented by an alliance of around 30 local and regional energy and climate agencies and institutions. All information material is still presented on a website directly.¹⁰⁷ Luxembourg is also showing how targeted education can work with a campaign by Climate Agence. In collaboration with the Ministry of Energy and the nature parks, a video series on “15 myths and facts about heat pumps” was produced to specifically address preconceptions.¹⁰⁸ AFPAC, the national trade association for heat pumps in France, provides target group-specific guides for home and building owners.¹⁰⁹ The French government is also supporting the spread of this technology with a combination of financial incentives and information campaigns. The Italian consumer organization Altroconsumo has launched a campaign to organize collective orders for air-to-water heat pumps. As part of this initiative, workshops are also being offered to inform consumers about the technology and its benefits.¹¹⁰ Poland relies on civil society initiatives such as the “Polish Smog Alert”, which organizes information campaigns to improve air quality and promote heat pumps.¹¹¹ In addition, the PORT PC organization regularly publishes studies and information materials that are intended to make the market more transparent and impart knowledge.¹¹² Heat pumps are already widely used in Sweden, not least thanks to the Swedish Energy Agency's ongoing energy advice program. In addition, national information events and conferences are held regularly, which appeal to both experts and the general public.^{113 114 115}

These examples show that a wide range of measures have been established throughout Europe to provide building owners with factual, accessible and widespread information about the use of heat pumps and thus pave the way for their rollout.

Table 2-2 provides an overview about the mentioned examples.

Table 2-2 Examples of information campaigns and tools

Country	Existing Information Materials	Capacity Building Events / Workshops
Germany	<i>So geht's mit Wärmepumpen!</i> information portal hosted by the Federal Environment Agency: UBA Portal ¹¹⁶	“Heat Pump Week” (November 2024), organised by the German Energy Agency (dena) and a coalition of local/regional energy agencies. ¹¹⁷
Luxembourg	Video series “15 myths and facts about heat pumps” produced by Climate Agence ¹¹⁸	Educational campaign in collaboration with the Ministry of Energy and nature parks. ¹¹⁹

¹⁰⁶ [UBA-Infoportal “So geht's mit Wärmepumpen!” | Umweltbundesamt](#)

¹⁰⁷ [Woche der Wärmepumpe | 4.-10. Nov](#)

¹⁰⁸ [15 Mythen und Fakten über Wärmepumpen | Klima-Agence](#)

¹⁰⁹ [France – European Heat Pump Association](#)

¹¹⁰ [Collective purchase of air-to-water heat pumps gets underway in Italy | BEUC](#)

¹¹¹ [Challenging public perceptions and reforming government programmes in Poland - Clean Air Fund](#)

¹¹² [Poland Electric Power](#)

¹¹³ [Swedish Energy Agency](#)

¹¹⁴ [Heat pump conference in Stockholm | NIBE](#)

¹¹⁵ [2023-05-26-heat-pumps-in-sweden-carlos-lopes.pdf](#)

¹¹⁶ [UBA-Infoportal “So geht's mit Wärmepumpen!” | Umweltbundesamt](#)

¹¹⁷ [Woche der Wärmepumpe | 4.-10. Nov](#)

¹¹⁸ [15 Mythen und Fakten über Wärmepumpen | Klima-Agence](#)

¹¹⁹ Ibid.

Country	Existing Information Materials	Capacity Building Events / Workshops
France	Targeted guides for homeowners provided by AFPAC (French heat pump industry association) ¹²⁰	Government-supported information campaigns and outreach activities to promote heat pump adoption. ¹²¹
Italy	Altroconsumo collective purchasing campaign for air-to-water heat pumps. ¹²²	Consumer information workshops conducted as part of the campaign to raise awareness and explain benefits of the technology. ¹²³
Poland	Public resources and studies published by PORT PC and civil society campaigns by Polish Smog Alert. ¹²⁴	Local information campaigns and knowledge resources; PORT PC provides technical studies and market transparency tools. ¹²⁵
Sweden	Energy advice materials and programmes by the Swedish Energy Agency ¹²⁶	National-level information events and recurring conferences for both experts and the public. ¹²⁷ ¹²⁸

2.3.3.3 Rationale, intervention logic and addressed barriers

Information campaigns can dispel myths about inadequacy of heat pumps, especially in cold weather.¹²⁹ In addition to general information on the operation, costs and environmental impact of heat pumps, collections of best practices can also have a motivating effect on building owners. Important information also concerns the suitability of buildings for the use of heat pumps, and the required characteristics of the building and the heating system. Owners are often unclear about this.

The suitability of a building for the use of heat pumps is determined by the energy status and the requirements of the heat distribution and delivery system. Although optimised thermal insulation helps to increase efficiency, it is not a necessary condition for the efficient operation of heat pumps¹³⁰. As Fraunhofer ISE has demonstrated in practical tests, even partially renovated old buildings can be heated efficiently using heat pumps¹³¹.

Heat pumps work optimally in combination with low-temperature heating systems (e.g. underfloor heating), which operate efficiently with flow temperatures (VLT) of 35 to 45 °C¹³². Lowering the system temperatures leads to a significant increase in efficiency in heat pump operation. However, current scientific studies show that conventional radiators can also be utilised, provided they are sufficiently dimensioned^{133;134}. Heating systems in existing buildings are often over dimensioned, which opens up the possibility of operating them with lower flow temperatures or only replacing individual radiators¹³⁵. This also opens the potential for existing buildings to integrate a heat pump without extensive changes to the heating system. Additionally, heat pumps can be installed in combination with solar thermal systems, photovoltaics, solar hybrids, geothermal energy, and energy storage, which can help reduce running costs and generate savings. Combining heat pumps with these systems may significantly shorten the payback period of the investment.

¹²⁰ [France – European Heat Pump Association](#)

¹²¹ Ibid.

¹²² [Collective purchase of air-to-water heat pumps gets underway in Italy | BEUC](#)

¹²³ Ibid.

¹²⁴ [Poland Electric Power](#);

¹²⁵ Ibid.

¹²⁶ [Swedish Energy Agency](#)

¹²⁷ [Heat pump conference in Stockholm | NIBE](#)

¹²⁸ [2023-05-26-heat-pumps-in-sweden-carlos-lopes.pdf](#)

¹²⁹ https://www.motiva.fi/en/home_and_household/energy_advice_for_consumers

¹³⁰ (PDF) [Durchbruch für die Wärmepumpe: Praxisoptionen für eine effiziente Wärmewende im Gebäudebestand](#)

¹³¹ https://www.ise.fraunhofer.de/content/dam/ise/de/downloads/pdf/Forschungsprojekte/BMWi-03ET1272A-WPsmart_im_Bestand-Schlussbericht.pdf

¹³²

https://www.researchgate.net/publication/369030083_Durchbruch_fur_die_Warmepumpe_Praxisoptionen_fur_eine_effiziente_Warmewende_im_Gebäudebestand

¹³³ https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2023/Analyse_Waermepumpen_im_Gebäudesektor.pdf

¹³⁴ <https://www.umweltbundesamt.de/publikationen/waermepumpensysteme-in-bestandsgebaeuden>

¹³⁵ <https://www.hamburg.de/resource/blob/161582/c9614a3e048a8760bd051ecc9900337a/heizenergie-effizienter-nutzen-data.pdf>

In times of skills shortages, tools can help building owners to check the suitability of their buildings for a heat pump. An online web tool that provides information about heat pumps could help homeowners find out if their property is suitable for a heat pump, and if so, which type. In Germany, for example, the Federal Environment Agency is currently developing an online consultation tool for technical laypersons in a project entitled 'Heat pump project database and low-temperature readiness standard' to check the suitability of a building for a heat pump¹³⁶. Such a tool makes it easier to bridge the gap between people who are interested in installing a heat pump and people who install them. By making it easy to find out which heat pump is suitable, people are more likely to be satisfied with the heat pump they have installed, which should improve the reputation of heat pumps. In addition, the installation industry is educating installers on how to advise consumers about installing a heat pump if their gas boiler breaks down.

Also, instructions and YouTube videos on how to set the flow temperature independently are already available. These are offered by various stakeholders, including heat pump manufacturers and installers. Although there are no systematic evaluations of the use of these offers, there appears to be interest. For the majority of building owners, simplified tools can provide an initial assessment of heat pump suitability.

The barriers addressed are poor reputation and poor information about heat pumps amongst building owners.

Impact of the measure

2.3.3.4 Expected impacts

Figures on the impact, the costs and benefits of information measures and tools are not known. Information material, campaigns and tools usually accompany other instruments, such as financial support. This makes it even more difficult to determine the impact of individual information instruments. The costs of individual campaigns are also not published.

The German nationwide "Heat Pump Week" in November 2024 (see Table 2-1) featured around 200 public events in which approximately 50,000 individuals participated.¹³⁷ There is nothing published about the costs.

Deeper research on the impact of the heat pump campaign of the French heat pump industry association (AFPAC) did not allow to gather any numbers about its impact.

Campaigns and tools are either publicly funded or funded by heat pump associations. Free access to information lowers the barrier for homeowners considering heat pumps, allowing them to find information without paying for an audit. Public funding is good for independent advice, but associations can also provide valuable information and tools.

2.3.3.5 Scalability

Information dissemination is easily scalable to reach a wider range of stakeholders, through digital platforms, workshops, and collaborations with local governments. Some of the mentioned examples might already address services and industry, and not only the residential sector.

2.3.3.6 Replicability

Similar information dissemination strategies can be adopted by other countries aiming to promote adoption of heat pumps and other renewable-based or renewable-ready heating technologies. These measures will likely be most impactful in countries with high levels of heating demand. Content will need to be adapted to align with local needs, based on style of communication, languages, and the characteristics of the building stock. Member States can get ideas and suggestions for further campaigns and tools from other countries.

Practicalities around implementation of the measure

2.3.3.7 Speed of implementation

Awareness campaigns and tools typically require between a few months and up to a year from initial design to public launch. In cases where new funding decisions, government coordination, and complex digital tools are provided, the process can require more time. Planning includes content development, outreach strategies,

¹³⁶ <https://www.umweltbundesamt.de/themen/klima-energie/erneuerbare-energien/umgebungswaerme-waermepumpen/so-gehts-waermepumpen/ueber-das-portal-so-gehts-waermepumpen#Einsatzm%C3%B6glichkeiten>

¹³⁷ <https://www.dena.de/infocenter/woche-der-waermepumpe-lockte-zahlreiche-besucherinnen-und-besucher-an/>

and expert engagement. Previous experiences with similar schemes may reduce the time needed for implementation.

2.3.4 Case Study: State guaranteed and interest-free loans for energy efficiency measures

Overview of the measure

2.3.4.1 Objectives and scope of the measure

Guaranteed and interest-free loans are financial instruments designed to support households and businesses in investing in energy efficiency measures. By reducing or eliminating borrowing costs and providing a guarantee against default, these loans lower the financial barriers to implementing upgrades such as insulation, heat pumps, or renewable heating systems. They aim to accelerate the adoption of energy-saving technologies while making energy efficiency investments more accessible and affordable.

In Slovenia there is a “**state guaranteed loan scheme**” that targets to enable apartment owners in multi-apartment buildings who do not have sufficient funds to finance investments for implementation of energy efficiency measures to take out a loan at a commercial bank secured with a state guarantee.¹³⁸

In Belgium, Brussels capital region, the ECORENO programme used to provide “**interest-free loans**” to households to finance energy efficiency improvements. According to the entry in the Odysee-Mure Database the programme started in 2007 with mortgage-style loans with interest rates of 0%. There was also a consumer-type loan with interest rates of 0% or 1%, depending on income and project type. Since then the conditions have been changed several times. In February 2023 the interest rates for mortgage-style loans increased to 1.5%–2.5%, depending on the income¹³⁹ whilst the consumer-type ECORENO loan still offered rates of 0% - 1%¹⁴⁰. In May 2023 the rates for the consumer loan increased to 1,5 to 2,5%, too¹⁴¹. In July 2025 the programme temporarily stopped to accept applications¹⁴².

The ECORENO loan (both the mortgage-style and consumer-type versions) is issued by the Fonds du Logement de la Région de Bruxelles-Capitale (also known as the Woningfonds Brussel), a cooperative with a social mandate using primarily public budget of the Brussels-Capital Region, supplemented by EU funding and other public contributions.¹⁴³ It directly offers both types of loans as part of the region’s housing and renovation program Renolution.

The programme covered works such as insulation, ventilation, and high-performance heating systems. The goal was to promote energy efficiency while addressing the financial barriers faced by low-income households. Personalised assistance was provided to ensure the successful application of funds, and the measure complemented regional goals under the Air-Climate-Energy Plan. The provision of interest-free loans meant that long payback periods were less of an issue for two reasons. Firstly, the total costs to be borne were lower, as only the investments and no interest had to be paid, and secondly, the fact that the loans were interest-free ensures that the monthly costs for the household did not increase over time, as the interest rate did not have to be renegotiated at the end of the commitment period.¹⁴⁴

Although today this measure has been converted into a ‘building renovation subsidy’ (see chapter 2.3.6), it remains an example for an “interest-free loan”. Availability of these kind of loans improves financial feasibility, allowing homeowners to benefit from lower energy bills without upfront costs, as well as making the total cost known from the start.

2.3.4.2 Geographic scope

These measures are described only for Slovenia and Brussels. However, the implementation is further widespread such as in France.¹⁴⁵ Furthermore, in 2015 the European Investment Bank (EIB) and the European Commission implemented similar support schemes, through the Private Finance for Energy Efficiency

¹³⁸ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/964>

¹³⁹ [ECORENO Credit | Fonds du logement Bruxelles](#)

¹⁴⁰ <https://fonds.brussels/fr/a-propos/communiqués-de-presse/le-fonds-du-logement-augmente-les-taux-de-son-credit-ecoreno>

¹⁴¹ <https://www.brusselstimes.com/belgium/485885/housing-fund-restricts-conditions-of-access-to-its-mortgage-loans>

¹⁴² <https://www.bruxelles-j.be/actus/suspension-credits-fonds-logement-bruxelles-2025>

¹⁴³ https://fonds.brussels/sites/default/files/2022-09/2022_09_06%20CONTRAT%20DE%20GESTION.pdf

¹⁴⁴ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/425>

¹⁴⁵ [Éco-prêt à taux zéro \(éco-PTZ\) | Service-Public.fr](#)

(PF4EE). The PF4EE provided additional resources to stimulate energy efficiency investment in countries such as Belgium, Cyprus, Czechia, Croatia, France, Greece, Ireland, Italy, Latvia and Portugal.¹⁴⁶

2.3.4.3 *Rationale, intervention logic and addressed barriers*

Government guarantees reduce the perceived risk for lenders and make loans more accessible to households with lower budgets or older homeowners who would otherwise not qualify. They also reduce interest rates.

Due to the lower financial hurdles, more homeowners are likely to undertake energy efficiency renovations.¹⁴⁷ The same is true for interest-free loans.

Impact of the measure

2.3.4.4 *Expected impacts*

The Slovenian measure “**state guaranteed loan scheme**” focuses on apartment owners in multi-apartment buildings, addressing a specific segment of the housing sector. A significant portion (23%) of Slovenia’s housing stock comprises multi-apartment buildings, many requiring energy efficiency upgrades. Slovenia has an aging building stock, with the majority of buildings constructed prior to 1980.

The government allocates funds to back loans, covering potential defaults and encouraging lender participation. State guarantees often lead to lower interest rates, decreasing the financial burden on homeowners. Ensuring that programs are accessible to all eligible homeowners, regardless of income or credit history, promotes social equity.

The measure should be combined with subsidies or tax incentives, to guide users on how to maximise financial benefits from energy efficiency measures. Coupling financial support with targeted information campaigns can enhance awareness and uptake among older populations. Providing guidance on selecting appropriate energy efficiency measures ensures effective use of funds.

The former Brussels measure “**interest-free loans**” focused on owners and future owners of residential properties. Since August 2022, the housing fund has granted 1,500 Ecoreno loans to help households renovate their homes; 40% of the loans went to households with low income¹⁴⁸. The number of interest-free loans granted could not be determined. However, ECORENO might be recognised as particularly useful for lower-income households that may not otherwise afford energy renovations.

2.3.4.5 *Scalability*

These measures are highly scalable, as they can be adapted to different levels of funding, different types of properties (e.g. rental buildings) or integrate additional incentives to increase impact and reach more stakeholders. Interest-free loans for low-income households can be used to incentivise energy efficiency investments, provided that sufficient funds are available.

2.3.4.6 *Replicability*

The concept of state-guaranteed loans for energy efficiency is adaptable to various countries and regions.

Interest-free loans for low-income households can be replicated in urban areas with high renovation needs and low renovation rates due to financial concerns. Ideal for regions with aging housing stock and low-income homeowners who struggle with financing renovations.

Practicalities around implementation of the measure

2.3.4.7 *Speed of implementation*

Implementing a government-backed loan scheme takes 1–3 years, covering policy design, financial partnerships, borrower eligibility, and disbursement systems. Faster rollout is possible for emergency loans, while larger programs require fraud prevention and sustainable repayment mechanisms. Previous experiences with similar schemes may reduce the time needed for implementation.

¹⁴⁶ [PF4EE Programme Loan](#)

¹⁴⁷ Maria Isabel Abreu, Rui A.F. de Oliveira, Jorge Lopes, Younger vs. older homeowners in building energy-related renovations: Learning from the Portuguese case, Energy Reports, Volume 6, Supplement 1, 2020, Pages 159-164, ISSN 2352-4847, <https://doi.org/10.1016/j.egyr.2019.08.036>.

¹⁴⁸ <https://www.levif.be/belgique/politique/regions/bruxelles/a-bruxelles-plus-de-1-500-credits-a-la-renovation-ecoreno-ont-ete-accordes-en-17-mois>

2.3.5 Case Study: Energy efficiency information programmes & tools

Overview of the measure

2.3.5.1 Objectives and scope of the measure

One of the main barriers to improving energy efficiency in buildings is the lack of awareness and knowledge among building owners, tenants, and even professionals such as architects and facility managers. Many stakeholders are unaware of the cost savings and comfort improvements energy-efficient retrofits can bring¹⁴⁹. Energy efficiency investments typically need long-term financial planning. Building owners and decision-makers need reliable data on costs, payback periods, and available subsidies or tax incentives. Information tools enable better planning by providing scenario analysis, tailored recommendations, and access to case studies or databases of successful retrofits.

A variety of information media and tools are employed in public awareness and consultation programmes aimed at promoting energy efficiency in buildings. These instruments are crucial in reaching diverse target groups and motivating behavioural change. The following communication channels and formats are commonly used across different initiatives:

- Personal consultations and advisory services are provided to building owners and residents. These offer tailored support on topics such as heating system selection, insulation, energy-efficient appliances, and post-renovation building maintenance. Such services often include free-of-charge counselling at local advisory centres.
- Television spots are used to deliver key messages to a broad audience, leveraging the high reach and emotional impact of visual media.
- Print media, including newspapers, brochures, and magazines, serve to inform the public in a more detailed and lasting format.
- Social media platforms are increasingly used for interactive engagement and to target specific demographic groups with tailored content.
- Internet platforms and online tools provide accessible, up-to-date information, interactive features, and practical guidance for implementing energy-saving measures.
- Public education and outreach activities, such as exhibitions and training sessions, are organized to deepen understanding and enable hands-on learning experiences.
- Networks of partner organizations and multipliers help disseminate information more effectively by mobilizing institutions with direct access to specific communities or user groups.

These media channels complement each other and, when applied strategically, significantly enhance the impact of information programmes on energy efficiency in the building sector.

Information tools, such as energy performance certificates (EPCs), home energy reports, and building renovation passports, help visualize energy use and potential improvements in an accessible way. The Energy Performance of Buildings Directive (EPBD) obliges EU Member States to issue EPCs for newly constructed and existing buildings when they are sold, re-let and, in some cases, extensively renovated. With the revision of the EPBD in 2024, EU Member States are also obliged to introduce a national building renovation passport scheme by 29 May 2026.

2.3.5.2 Geographic scope

Information programmes are known from several Member States, such as LV, CZ, SI, FR, and DE. There are probably many others.

Information Programme "Let's Live Warmer" (Latvia)

In Latvia the programme motivates for building energy efficient renovation. Wide scope of methods is applied to reach and to inform and consult societies of the flats' owners (housing associations) regarding conditions and benefits of energy efficiency increase and the best practices of it, available financial support. Programme consults also on the good practice of maintaining the apartment building after renovation. To enhance awareness and improve access to energy efficiency support, the initiative offers free consultations, informative campaigns, financial assistance, and centralized tools, resources, and documentation. A one-stop agency that creates tailored action plans to help homeowners improve energy efficiency and assists in securing co-

¹⁴⁹ Expert interviews and webinar participants

financing. It has also developed a digital app, "VērtēRenovē!", which supports homeowners in making informed decisions about energy efficiency improvements.¹⁵⁰

Information campaign on raising awareness about energy efficiency (Czech Republic)

The measure, managed by the Ministry of Industry and Trade, aims to raise awareness of energy efficiency with a view to changing the behaviour of energy consumers and reducing energy consumption.

The national information campaign will be multilevel in order to maximise the impact on energy consumers. Information activities will be realised through TV spots, information activities in print media, information activities on social networks and, last but not least, through an Internet platform.¹⁵¹

Energy advice network for citizens – ENSVET (Slovenia)

Energy advice network for citizens - ENSVET is the main programme for advising, informing, and assisting the citizens (local residents) in the implementation of energy efficiency measures in households and the expansion of consulting for companies in 2027.

The consulting and assistance regarding the energy efficiency measures is very important and free of charge for all owners of houses, who want to invest in energy efficiency measures. The consulting offices advise in the following cases:

Selection of heating systems and heating devices, exchange of the old heating device and heating, decrease of fuel consumption, selection of suitable fuels, insulation of buildings, selection of suitable windows, sanitation of buildings with the purpose to reduce energy consumption, using energy efficient households' appliances, in all other questions about the energy use in households.¹⁵²

ADEME energy-saving awareness campaign (France)

The objective of this operation carried out by ADEME and supported by Ministries is to sensitize and mobilise the public audience about energy management and climate change in order to incite them to act daily to make energy savings. The logic has been to find partners in order to constitute networks in capacity to diffuse efficiently messages and information towards different types of targeted public. A campaign was released across all media platforms with a slogan and a "club of partners" was created to improve public awareness of climate change by communication, training, exhibitions etc.¹⁵³

Information campaigns by various actors (Germany)

In Germany, a wide range of information programmes and campaigns support building owners in implementing energy-efficient renovations. These initiatives aim to raise awareness, provide expert advice, and facilitate access to financial incentives, thereby encouraging sustainable transformation of the building stock.

The federal government provides detailed information on energy efficiency and climate protection in buildings to accompany the federal subsidy for energy-efficient buildings (BEG). The federal government provides the website "energiewechsel.de", offering a comprehensive platform with best practices, financing advice, and planning tools for residential, commercial, and public buildings.¹⁵⁴ At the regional level, energy and climate protection agencies conduct tailored information campaigns that address local needs. These often include personal energy advice, public outreach, and stakeholder engagement to foster energy-efficient building renovation.

Municipalities are supported through the National Climate Initiative (NKI) to launch local renovation campaigns targeting homeowners.¹⁵⁵ These initiatives aim to inform and motivate private property owners to implement energy-saving measures in their buildings. Furthermore, the consumer advice centres (Verbraucherzentralen) offer government-funded energy counselling services. These are available nationwide and provide independent, expert guidance on topics such as heating systems, insulation, and renewable energy, through telephone, online, or in-person consultations.

¹⁵⁰ [Let's live warmer | Ekonomikas ministrija](#)

¹⁵¹ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4375>

¹⁵² [Mreža Ensvet | Eko sklad](#)

¹⁵³ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/604>

¹⁵⁴ <https://www.energiewechsel.de/KAENEf/Navigation/DE/Home/home.html>

¹⁵⁵ <https://www.klimaschutz.de/de/service/medien/energetische-gebauedesanierung-mit-einer-sanierungskampagne-hauseigentumerinnen>

2.3.5.3 *Rationale, intervention logic and addressed barriers*

Providing information to building and flat owners makes them aware both of the inefficiency of the property and of how to address it, removing a barrier for those otherwise unlikely to be aware of how to achieve savings such as the elderly.

Programs like ENSVET offer personalized advice, making energy efficiency measures more accessible to older homeowners by accounting for their personal circumstances.

Multilevel campaigns, such as the one in the Czech Republic, ensure that information reaches a broad audience, including the elderly. The addressed barriers are “Lack of awareness of possible energy savings”, “Bad reputation and missing Information”, and “High age of building owners”.¹⁵⁶

Impact of the measure

2.3.5.4 *Expected impacts*

These programs aim to reach a wide audience, including older homeowners, to promote energy efficiency. However, only few numbers about their impact are published:

- The one-stop-agency expects (Latvia): 11 Peta Joule (PJ) cumulative energy savings 2012-2030.¹⁵⁷
- Information campaign on raising awareness about energy efficiency (Czech Republic): 30 PJ cumulative energy savings 2021-2030.¹⁵⁸
- Energy advice network for citizens -ENSVET (Slovenia): 2.4 PJ cumulative energy savings 2010-2021; 82 kt CO2 cumulative emission savings 2010-2021.¹⁵⁹

Government agencies typically fund these information programs. Information programs are usually free for participants. Ensuring that information is accessible to all demographics, including those with limited digital literacy, is crucial. Coupling financial support with targeted information campaigns can enhance awareness and uptake among older populations. Providing guidance on selecting appropriate energy efficiency measures ensures effective use of funds.

2.3.5.5 *Scalability*

Information programs can be scaled nationally or regionally. Ensuring active participation from different target groups and different homeowners, e.g. older homeowners, apartment owners, requires targeted strategies.

2.3.5.6 *Replicability*

Similar programs can be implemented in other countries.

Practicalities around implementation of the measure

2.3.5.7 *Speed of implementation*

Awareness campaigns and training programs take 6 months to 3 years, depending on scale and complexity. Planning includes content development, outreach strategies, and expert engagement. Previous experiences with similar schemes may reduce the time needed for implementation.

2.3.6 Case Study: Financing support for building renovation

Overview of the measure

2.3.6.1 *Objectives and scope of the measure*

Financing support for building renovation reduce costs and can incentivize energy efficiency measures. Funding can be provided in the form of grants or soft loans with or without repayment subsidies. Several Member States already have funding programmes that differ in terms of their design. Both the building envelope and the heating system can be eligible for funding. Article 17 of the EPBD recast require MS to

¹⁵⁶ Maria Isabel Abreu, Rui A.F. de Oliveira, Jorge Lopes, Younger vs. older homeowners in building energy-related renovations: Learning from the Portuguese case, Energy Reports, Volume 6, Supplement 1, 2020, Pages 159-164, ISSN 2352-4847, <https://doi.org/10.1016/j.egyr.2019.08.036>.

¹⁵⁷ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#measures/779>

¹⁵⁸ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#measures/4375>

¹⁵⁹ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#measures/950>

provide adequate financing and support measures and includes several recommendations on how to best target such support measures. The eligible technologies play an important role in the effectiveness of the support programmes. In addition to heat pumps, systems consisting of heat pumps and photovoltaics and, where applicable, storage systems, as well as solar thermal systems can also be subsidised for heating systems.

2.3.6.2 Geographic scope

Financing support for building renovations are available in several MS. Some of the funding programmes include specific support for households with low income. Examples include:

Renovation of apartment buildings 2022-2030 (Estonia):

This measure provides financial support for both the complete reconstruction of apartment buildings and, as an individual activity, the replacement of a heating device in the heating system of a gas, furnace or electric apartment building with a heating device using renewable energy sources, or the connection of these apartment buildings to a district heating network.¹⁶⁰

Austrian Federal Government's Renovation Initiative (Austria):

Funds are made available for the enhancement of the thermal quality of residential buildings and the expansion of efficient heating systems, as well as for efficient new construction. The amount received is dependent on the achieved thermal quality and efficiency.¹⁶¹ In February 2021, the Austrian Ministry for Climate Protection launched a new funding initiative to support thermal building renovations (the “*renovation cheque*”) and the replacement of fossil-fuel-based heating systems (“*out of oil and gas*”) with climate-friendly alternatives. This national subsidy programme aims to reduce heating energy demand and promote the transition to low-carbon heating technologies. Private households and businesses are eligible for grants of up to €5,000 when replacing fossil-fuel heating systems with district or local heating connections. Where such connections are not feasible, support is available for the installation of climate-friendly heat pumps or biomass-based central heating systems. In addition, households affected by energy poverty may receive up to 100% of the investment costs covered.¹⁶²

MaPrimeRénov (France):

The MaPrimeRénov’ programme—originally launched in 2011 under the name *Habiter Mieux*—was designed to support low- and modest-income households in undertaking energy renovations. Funded primarily through the French National Housing Agency (ANAH), the programme is financed via EU Emissions Trading System (ETS) revenues, energy suppliers' contributions through white certificates, and additional minor sources.

Initially, MaPrimeRénov’ offered two types of financial assistance: support for individual renovation measures and for comprehensive retrofits, with aid levels tailored to household income and size. Over time, the scheme was restructured to incentivize more holistic renovations over isolated measures. Income ceilings are adjusted regionally, with higher thresholds in Île-de-France to account for cost-of-living differences. Households are divided into five income categories, which determine eligibility and the level of subsidy. The extent and type of renovation work also influence the amount granted.

The standard MaPrimeRénov’ scheme provides financial incentives for the installation of low-carbon heating and domestic hot water systems. While additional insulation work is permitted, it is not mandatory. In multi-unit residential buildings, replacing the heating system is optional. Eligible properties must be at least 15 years old and serve as the owner’s primary residence. All recipients are entitled to advisory support through Mon Accompagnateur Rénov’, a guidance service targeting homeowners with very low, low, or intermediate incomes. Higher-income households are excluded from the scheme.

Financing is provided as fixed amounts based on the technology installed and the income category of the applicant. For instance, an air-to-water heat pump is subsidised at €3,000 for intermediate-income households and €5,000 for very low-income households. For thermal insulation, grants are calculated per square meter, with rates varying by income group and renovation type. In select areas, the Territories of Zero Energy Exclusion initiative provides top-up funding to ensure full project financing for eligible households.

¹⁶⁰ <https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/estonia.html#buildings>

¹⁶¹ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/402>

¹⁶² Ibid.

The MaPrimeRénov' Parcours variant supports ambitious, performance-based renovations. To qualify, projects must achieve an improvement of at least two energy performance certificate (EPC) classes and include a minimum of two different insulation measures. Fossil-fuel heating systems are ineligible; existing oil- and coal-based systems must be replaced. An initial energy audit is mandatory to assess the project's potential. For homes initially rated G, F, or E, phased renovations over up to five years are permitted, provided that beneficiaries are assisted by a Mon Accompagnateur Rénov' case officer throughout the process.^{163 164}

Federal subsidy for efficient buildings (Bundesförderung für effiziente Gebäude (BEG)) (Germany):

This funding scheme supports individuals, municipalities, companies, NGOs in improving energy efficiency of the building envelop and the heating system. From 2024, the funding of heating systems consists in a base-subsidy of 30% for all homeowners, landlords, companies, non-profit organisations and municipalities, which replace old fossil heating systems. An additional subsidy of 30% is granted to households with a taxable household income of a maximum of 40.000€ annually. Additional subsidisation can be received (depending on the situation of the applicant), although the maximum subsidy is 70%.¹⁶⁵

Eco-Fund (Slovenia):

Eco Fund (Slovenian Environmental Public Fund) is a Slovenian programme aimed at reducing energy poverty among most vulnerable citizens. Incentives for energy efficiency improvements can go up to €9,620 or €15,000 in the case the roof of the building is in bad condition. Beneficiaries can obtain such incentives for a number of energy-efficiency improvements, including the installation of heat pumps. Incentives come in the form of grants/subsidies and soft loans.

Clean Air Programme, Warm Apartment Programme (Warm housing), Stop the Smog (Poland)

There are several funding instruments to improve the energy efficiency of residential buildings in Poland. The two main programmes are the Clean Air Programme, addressing single family houses, and the Warm Apartment Programme, addressing multi-family houses. In both programmes, the amount of funding is staggered according to income, the lower the income, the higher the funding. There are three income levels in each programme. Households with high incomes are not eligible for the subsidy. The main aim of the programmes is to improve air quality and replace the remaining coal stoves. Subsidies are provided for alternative heating technologies and for renovation measures aimed at improving the building envelope. The subsidy rate for heat pumps is higher than that for new and efficient fossil fuel technologies.

One more Polish programme, Stop the Smog, addresses the least well-off households in single-family houses, particularly those whose members are entitled to cash benefits. Heating system replacement and energy refurbishments are subsidised.¹⁶⁶

2.3.6.3 Rationale, intervention logic and addressed barriers

Subsidies offset high up-front costs, making renovations more affordable. Specific support for energy-poor applicants ensures those least able to afford renovations can achieve energy use reductions. Through subsidies, energy efficiency renovations become more accessible. High up-front costs and insufficient operating cost savings reduce incentive for investments and high renovation efforts often overburden private owners. This cost is high also for commercial buildings but may be more actionable in this sector as commercial enterprises are expected to take a more proactive, economically efficient approach to heating system replacement.¹⁶⁷

Impact of the measure

2.3.6.4 Expected impacts

According to the Odyssee-Mure-Database the following impacts are expected:

¹⁶³ <https://publications.jrc.ec.europa.eu/repository/handle/JRC140866>

¹⁶⁴ <https://france-renov.gouv.fr/preparer-projet/faire-accompagner/mon-accompagnateur-renov>

¹⁶⁵ <https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/germany-german.html#overview>

¹⁶⁶ <https://publications.jrc.ec.europa.eu/repository/handle/JRC140866>

¹⁶⁷ <https://build-up.ec.europa.eu/en/resources-and-tools/articles/eu-initiatives-financing-building-renovation>

Clara Camarasa, Lokesh Kumar Kalahasthi, Leonardo Rosado, Drivers and barriers to energy-efficient Technologies (EETs) in EU residential buildings, Energy and Built Environment, Volume 2, Issue 3, 2021, Pages 290-301, ISSN 2666-1233, <https://doi.org/10.1016/j.enbenv.2020.08.002>.

- Estonia: cumulative savings of 0.183 PJ in 2030¹⁶⁸ and a € 460 million cumulative public budget (2022-2028).
- Austria: cumulative savings of 7.9 PJ (2014-2020)¹⁶⁹ and a €381 million cumulative public budget (2014-2020).
- Germany: 14,600 kt CO₂ (total annual savings in 2030)¹⁷⁰ with yearly budgets between 7.5 billion euros in 2024 and 2025 and 10.3 billion euros from 2026.¹⁷¹
- France: around 2.1 million renovations carried out between 2020 and 2023, of which 247,680 are large-scale renovations, supported by 9.8 billion euros in aid.¹⁷²

These programmes might target various sectors, including residential, commercial, and public buildings, aiming for widespread energy efficiency improvements. Depending on coverage the potential savings would be substantial. Improved energy efficiency can lead to reduced energy poverty and enhanced public health due to better living conditions. Targeted subsidies can reduce energy poverty, delivering social benefit.

For the most part, financing support is government funded. While state support reduce initial expenses, property owners may still bear a portion of the costs. While the own contribution of the building owners is often amortized through long-term savings, low-income households might have problems paying the own contribution in the short term. It may therefore be necessary to combine a grant with a soft loan for the own contribution. Moreover, these programs can complement tax incentives to increase overall funding and reduce the overall cost of renovations. However, they can also be available as an alternative. Information programmes are necessary to ensure that households make use of the subsidies. Financial support is also complement measures such as mandatory standards by making implementation based on these measures more affordable. Furthermore, retrofitting buildings increases the efficiency of heating technologies like heat-pumps and makes them more attractive in the long-run.¹⁷³

2.3.6.5 Scalability

These programs are designed to be scalable, with frameworks that can be expanded to accommodate more applicants as additional funding becomes available. Scaling up requires increased financial resources and administrative capacity to manage a higher volume of applications.

2.3.6.6 Replicability

Support for building renovation are already in place across many Member States. This may limit additionality possible for these measures, but expansion of existing measures and consideration of how implementation can be improved may yield positive impacts.

These support models can be adapted to other countries, provided there is political will, available funding, and a supportive policy framework. Successful replication depends on factors such as the existing condition of the building stock, economic conditions, and the capacity of the construction industry to meet increased demand. Subsidy measures are suitable for all other Member States, and the value and eligibility requirements of the subsidy can be set based on the national context. However, improving energy efficiency should be encouraged, as it offers significant returns: in the buildings sector, each euro invested yields a return of 12 euros over the lifetime of the investment, while in industry, one euro invested results in 4 euros of energy savings over the same period.¹⁷⁴

Practicalities around implementation of the measure

2.3.6.7 Speed of implementation

Implementing a government subsidy scheme takes 1–3 years, including policy design, administrative setup, beneficiary registration, and rollout. Emergency programs may take months, while complex schemes need years for infrastructure, fraud prevention, and full implementation. Previous experiences with subsidy schemes may reduce the time needed for implementation.

¹⁶⁸ <https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/estonia.html#buildings>

¹⁶⁹ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#measures/402>

¹⁷⁰ <https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/germany.html>

¹⁷¹ https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/projektionen_2025-instrumentenpapier_korr_2.pdf

¹⁷² https://www.anah.gouv.fr/sites/default/files/2024-01/202401_ChiffresCles2023_WEBA.pdf

¹⁷³ <https://iea.blob.core.windows.net/assets/4713780d-c0ae-4686-8c9b-29e782452695/TheFutureofHeatPumps.pdf>

¹⁷⁴ [Energy efficiency awareness - European Commission](#)

2.3.7 Case Study: Tax deductions for energy efficiency renovations and renewable heating systems / VAT deductions

Overview of the measure

2.3.7.1 Objectives and scope of the measure

In addition, or as an alternative to programmes in which grants, low-interest loans or repayment subsidies are granted, financial support for energy-efficient renovations including the heating system can be provided through tax incentives. Tax incentives can be designed as deductibility of renovation costs from tax liability or reduced VAT on renewable heating technologies, e.g. heat pumps.

While a reduced VAT for heat pumps is widespread within Member States, a tax deductibility is only known from Germany.

2.3.7.2 Geographic scope

Many Member States already use tax deductions for incentivizing energy efficiency measures.

Reduced VAT for buying and installing a heat pump

In 2023, a reduced VAT for heat pumps applies in 17 EU Member States (LT, BG, AT, BE, CZ, EE, FR, EL, IE, IT, LV, LU, PL, PT, RO, CY, SI).¹⁷⁵ The amount of the reduction varies between 19% in Luxembourg and 75% in Greece. A VAT exemption for buying a heat pump applies in two Member States (Lithuania, Bulgaria) and the UK. Sometimes the heat pump must fulfil certain requirements. In Romania, the reduction is also applicable for solar thermal panels.¹⁷⁶

Reduced VAT for energy renovations in the residential sector - Cyprus

In Cyprus, tax incentives include increased capital allowances of 4% (from 3% to 7%) for investment to increase the energy efficiency of buildings, provided the investments are made during the fiscal years 2023-2026.¹⁷⁷

Thermo-modernisation tax relief (Poland):

In Poland the full value of energy efficiency renovations (up to PLN 53,000, equivalent to around EUR 12,500¹⁷⁸), including related costs such as energy audits, is deductible from taxable income for the purposes of calculating income tax in single-family residential buildings.¹⁷⁹

Reduced VAT-rate on Labour costs (Netherlands):

In The Netherlands there is a reduced VAT rate on labour costs for insulation and glass and for maintenance and renovation of residential buildings (Verlaagd BTW tarief). The labour component of the cost of energy efficiency renovations on residential buildings over 2 years old has a VAT rate reduction from 19% to 6%.¹⁸⁰

Tax Credits for Small Scale Landlords to Retrofit Rental Houses (Ireland)

Small-scale landlords can deduct up to € 10 k from their rental income for the purposes of determining tax if they retrofit their property while a tenant remains in the property.¹⁸¹

Household tax credit (Finland)

In Finland homeowners are eligible for the Household tax credit covering labour costs associated with replacing, upgrading, and repairing heating systems in small residential houses, as well as other energy efficiency improvements. The rate of the deduction varies by recipient and the specific work done.¹⁸²

Tax incentives for energy-efficient home renovation (Luxembourg):

¹⁷⁵ For more information on measures reducing VAT on electricity consumed by heat pumps refer to Chapter 2.3.1.

¹⁷⁶ https://www.ehpa.org/wp-content/uploads/2023/09/EHPA_VAT-on-heat-pumps-in-Europe-report_September-2023.pdf

¹⁷⁷ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/466>

¹⁷⁸ As per the conversion rate 1 PLN = 0.2344 EUR, (Aug 29, 2025).

¹⁷⁹ <https://www.podatki.gov.pl/pit/ulgi-odliczenia-i-zwolnienia/ulga-termomodernizacyjna/>

¹⁸⁰ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/842>

¹⁸¹ [Minister Donohoe announces a new tax incentive to encourage small-scale landlords to undertake retrofitting works](#)

¹⁸² <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/582>

To encourage energy-efficient renovations, rental properties that qualify for financial aid under the "Klimabonus Wunnen" program can benefit from a 6% depreciation rate for 10 years on sustainable energy upgrades. Additionally, all renovation work—including but not limited to energy improvements—can take advantage of a special reduced VAT rate of 3%, up to a certain limit.¹⁸³

Tax deduction in Germany

In Germany homeowners can deduct 20% of the costs from renovation measures on the building envelope and the installation of new renewable heating systems from their income tax^{184, 185}. 20% of the expenses and at most EUR 40,000 per residential property is tax deductible, spread over three years. (§35c, para. 1, EStG 2009). This addresses citizen paying taxes who renovate their building they live in. The deduction can be claimed for through the income tax declaration. This tax subsidy cannot be combined with a subsidy from the "Federal subsidy for efficient buildings" (BEG).¹⁸⁶ The tax reduction of up to EUR 40,000 can also be granted for energy-related measures in a condominium. In this case expenses relating to the separate property and the common property are eligible. Expenses for energy efficiency measures that affect the common property are to be taken into account in proportion to the co-ownership share.¹⁸⁷

2.3.7.3 Rationale, intervention logic and addressed barriers

Reduced VAT, and/or relief on other tax via a tax credit for energy efficiency measures offsets the high cost, reducing the financial burden on households.

Tax incentives directly reduce the financial burden on homeowners, making energy efficiency measures and renewable heating systems more accessible and attractive.

Impact of the measure

2.3.7.4 Expected impacts

By making renewable heating systems more affordable, these measures to reduce the upfront cost aim to significantly increase their penetration in the residential sector, thereby reducing reliance on fossil fuels. Widespread adoption of renewable heating systems can lead to substantial reductions in greenhouse gas emissions from the residential heating sector.

Evaluations of the tax deductibility of refurbishment measures in Germany are not available. Tax deductibility is handled by the Federal Ministry of Finance (while the "Federal subsidy for efficient buildings" - programme is handled by the Ministry of Economics and Energy) via the local tax offices and has not been systematically evaluated yet. It is unclear which groups of owners may prefer tax incentives to a subsidy via the existing subsidy programmes. It is assumed that a tax deduction is more attractive for wealthy owner-occupied households with a high tax burden.

The cost to the government is indirect, manifesting as reduced tax revenues due to deductions and lower VAT collections. As consumers benefit from reduced costs, manufacturers and installers may experience increased demand, potentially leading to economies of scale and reduced prices over time. The social benefits, including environmental improvements and the potential for reduced energy costs for households, could be expected to outweigh the loss in tax revenue.

With regards to synergies with other measures, VAT deductions complement other funding programmes. All Member States with subsidies for energy efficiency measures including heat pump installations mentioned in chapter 2.3.6 additionally have a reduced VAT on heat pumps, except from Germany. The effectiveness of VAT reductions depends on factors such as average income levels, existing heating infrastructure, and public awareness of renewable technologies. The tax incentive in Germany replaces other financial measures such as subsidies.

¹⁸³ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4777>

¹⁸⁴ [Income Tax Act - Income Tax Act](#)

¹⁸⁵ [ESanMV - Ordinance on the Determination of Minimum Requirements for Energy-Efficient Measures for Buildings Used for Own Residential Purposes in Accordance with Section 35c of the Income Tax Act](#)

¹⁸⁶ <https://www.energiwechsel.de/KAENEf/Redaktion/DE/Foerderprogramme/steuerliche-foerderung-fuer-energetische-gebaeudesanierung.html>

¹⁸⁷ <https://www.bvl-verband.de/fileadmin/steuerpolitik/bmf-schreiben/2021/2021-01-14-steuerliche-foerderung-energetischer-massnahmen-an-zu-eigenen-wohnzwecken-genutzten-gebaeuden-einzelfragen-zu-paragraf-35c-EStG.pdf>

2.3.7.5 Scalability

These tax incentives can be scaled nationally, depending on fiscal capacity and policy priorities. Implementation requires adjustments to tax codes and effective communication strategies to inform eligible homeowners.

2.3.7.6 Replicability

The reduced VAT measures can be transferred to other member states depending on the fiscal possibilities and political priorities. Adjustments to align with national tax systems and economic conditions might be necessary. Success depends on factors such as public awareness, the simplicity of the application process, and the availability of qualified installers.

Practicalities around implementation of the measure

2.3.7.7 Speed of implementation

Launching a VAT-reduction scheme takes 1–2 years, requiring policy design and legislative approval. Launching tax incentives might take 2–4 years, requiring policy design, legislative approval, and administrative setup. Coordination with tax authorities, businesses, and monitoring bodies ensures compliance. Previous experiences with similar schemes may reduce the time needed for implementation.

2.4 INDUSTRY

This section presents the 5 best practice case studies developed to promote decarbonisation of the industry sector.

2.4.1 Case Study: Financing schemes supporting energy efficiency investments

Overview of the measure

2.4.1.1 Objectives and scope of the measure

Subsidy schemes implemented across several EU Member States aim to stimulate private investment in energy efficiency (EE) and renewable energy (RE) by reducing the financial burden of such improvements. These measures promote sustainable energy practices and innovation in industrial and commercial sectors, while contributing to the reduction of greenhouse gas emissions and overall energy consumption. Although the specific design varies by country, the schemes generally target SMEs, large companies, and municipal enterprises through a mix of financial instruments, including investment grants (e.g., Austria's Domestic Environmental Support Programme - UFI), tax credits (e.g., Hungary's corporate income tax credit), and soft loans (e.g., Latvia's ALTUM programme). The support provided through these subsidy schemes does not constitute a breach of EU state aid rules. This is because the aid is either of a general and thus non-discriminatory nature, or considered compatible as it falls under the General Block Exemption Regulation (GBER) or the Climate, Energy and Environmental Aid Guidelines (CEEAG).

2.4.1.2 Geographic scope

These measures are widely implemented across EU Member States. This case study includes programmes from Austria, Finland, Germany, Hungary, Italy, Latvia, the Netherlands, Poland, and Spain. While the overarching goal is consistent, the implementation details vary significantly. Such details include the mix of financial instruments, the level of financial support, the thresholds to access the programme, the targeted stakeholders (SMEs vs large industries, specific sectors, etc.), and the types of investments eligible for funding.

For instance, Austria's UFI programme focuses on grants for thermal renovation and heat recovery, while Finland's scheme includes subsidies for energy audits and investments in new technologies. In Latvia, soft loans are tailored to the cash flow generated by energy savings, making them particularly accessible to SMEs.¹⁸⁸ Italy's Transition 5.0 Plan is notable for linking tax credits directly to energy performance outcomes¹⁸⁹, while Spain's regionally administered grant programme ensures local adaptation and accessibility across diverse industrial contexts.¹⁹⁰

2.4.1.3 Rationale, intervention logic and addressed barriers

Many businesses (especially SMEs) face financial barriers to investing in energy efficiency, such as high upfront costs and limited access to capital. These subsidy schemes address such barriers by reducing investment costs and improving financing conditions. For example, Germany's KfW Environmental Protection Programme offers long-term loans at favourable interest rates, with eligibility based on projected energy savings.¹⁹¹ In Hungary, the tax credit is only available for projects that exceed mandatory efficiency standards, ensuring that public funds support genuinely additional improvements. Italy's Transition 5.0 plan addresses both financial and informational barriers by tying support to measurable outcomes, thus encouraging data-driven investment decisions. Spain's programme, by decentralising implementation to regional authorities, increases the flexibility and enhances responsiveness to local industrial needs.

The financial side of these programmes is particularly beneficial to SMEs, which may lack the financial capacity to undergo significant investment in EE and RE, in comparison with larger enterprises. Additionally, administrative simplification, as seen in Germany's low-requirement application process and Spain's regional delivery model, further reduces barriers for small industries.

Impact of the measure

¹⁸⁸ [Aizdevumi uzņēmumu energoefektivitātei vai ilgtspējai - Altum](#)

¹⁸⁹ [Transizione 5.0](#)

¹⁹⁰ [Direct granting of aid for energy efficiency actions in SMEs and large companies in the industrial sector | Idae](#)

¹⁹¹ https://www.bundeswirtschaftsministerium.de/Redaktion/EN/Publikationen/national-energy-efficiency-action-plan-eeap.pdf?__blob=publicationFile&v=1

2.4.1.4 Expected impacts

These schemes have demonstrated effectiveness in making EE investments more accessible. Austria's Domestic Environmental Support Programme reported cumulative energy savings of 60.1 PJ between 2014 and 2020.¹⁹² Germany's Environmental Protection Program achieved annual savings of 1.8 PJ in 2020, with a annual reduction of 10.9 MtCO₂e in emissions.¹⁹³ Spain's "Direct granting of aid for energy efficiency actions in SMEs and large companies in the industrial sector" programme estimate cumulative savings of 42 PJ by 2030.¹⁹⁴ The Netherlands' BMKB-G scheme lacks explicit targets, however it complements other green measures, such as the Energy Investment Allowance (EIA), which allows companies to deduct up to 40% of their green investment against their corporate income tax.

Public investment varies: Austria allocates €90 million annually,¹⁹⁵ Finland €198 million over five years (2018-2023)¹⁹⁶, and the Netherlands guarantees 90% of loans under a €1.5 billion budget, significantly de-risking private lending.¹⁹⁷ In Germany, the available budget for loans in 2020 was €2 billion.¹⁹⁸ Italy's Transition 5.0 Plan is supported by a budget of €6.3 billion for the years 2024-2025. Spain allocated a total budget of €652 million between 2019 and 2024.¹⁹⁹

2.4.1.5 Scalability

These schemes are highly scalable. Their flexible design allows for adaptation across sectors and enterprise sizes. Italy's Transition 5.0 plan exemplifies scalability by linking support to performance metrics, which can be applied across industries and scaled based on energy intensity. As such, the level of support can be adjusted so that energy-intensive industries receive greater assistance, while less energy-intensive industries are provided with proportionately adjusted support. Latvia's ALTUM programme demonstrates how soft loans can be scaled based on energy savings performance, making the model replicable in other contexts. Spain's regional implementation model also supports scalability by allowing each region to tailor the programme to its industrial base. This way, each region can adjust support measures and resource allocation to mirror the characteristics and needs of its local industries. However, Spain's decentralised model comes at the price of an increased burden on regional administrations, which may face a challenge due to low manpower and relevant skill sets to handle such programmes.

2.4.1.6 Replicability

The measures are replicable across EU Member States, particularly where administrative capacity and political agenda align. Countries with similar industrial structures and energy challenges stand to benefit most from other countries' prior experience with subsidy schemes. The flexibility in design, which includes instruments from grants to tax credits and loans, allows for tailoring to national contexts and national budgetary constraints. Replicability is likely to be more challenging when there are significant differences in administrative organization between countries, requiring additional efforts to adapt these measures to diverse contexts.

Practicalities around implementation of the measure

2.4.1.7 Speed of implementation

Implementation typically takes 1–3 years, depending on the complexity of the scheme and existing administrative infrastructure. Countries with prior experience are likely to implement new schemes more rapidly. For instance, Italy's Transition 5.0 plan was first announced in early 2023 and approved in February 2024. However, the implementing decree and the updated guidelines for implementation were published only in August 2024. This measure, alongside other measures exemplified here, builds upon previous subsidy programmes and thus required less time for development.

Emergency programs may be deployed within months, while more complex systems - such as those involving tax credits or performance-based loans – may require longer times for setup and the development of fraud prevention systems.

¹⁹² <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1028>

¹⁹³ <https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1144>

¹⁹⁴ [Direct granting of aid for energy efficiency actions in SMEs and large companies in the industrial sector | Idae](#)

¹⁹⁵ See note 192.

¹⁹⁶ <https://www.altum.lv/pakalpojumi/biznesam/aizdevumi-uznemumu-eneregoefektivitatei/>

¹⁹⁷ [BMKB-Groen | RVO.nl](#)

¹⁹⁸ See note 193/196.

¹⁹⁹ See note 194.

2.4.2 Case Study: Voluntary energy efficiency agreements

Overview of the measure

2.4.2.1 Objectives and scope of the measure

Voluntary Energy Efficiency Agreements incentivise companies to decarbonise by supporting energy auditing, implementation of energy management systems, and formal commitments to improve energy efficiency. The impact of voluntary energy efficiency agreements can be significantly affected by the willingness of businesses, municipalities and other actors. These agreements serve as a flexible alternative to mandatory measures, allowing companies and municipalities to implement energy-saving actions tailored to their specific needs and timelines. They are a collaborative initiative between the government and various sectors, aiming to enhance energy efficiency. Voluntary Energy Efficiency agreements can help contribute to achieving targets set by the Energy Efficiency Directive (EED), as well as contributing towards the implementation of obligations set under the Energy Performance of Buildings Directive (EPBD)²⁰⁰. By implementing energy efficiency measures under such agreements, companies contribute to CO₂ reduction targets as well and can meet economic requirements to safeguard the companies' growth opportunities and continuity²⁰¹. In some cases, companies participating in the energy efficiency agreements receive extensive support, in the form of guidance and advisory services, and in some cases, they have access to discretionary subsidies for energy-saving investments.²⁰²

2.4.2.2 Geographic scope

There are multiple cases of voluntary energy efficiency agreements in Europe. Two notable examples are implemented in Belgium (Flanders & Wallonia) and in Finland.

Finland see Energy Efficiency Agreements as an important part of their energy and climate strategy. The agreements are planned to guide companies and municipalities towards continuous improvement in energy efficiency. The participants set a quantitative energy efficiency improvement target for themselves, and they implement actions, in order to achieve their targets which are set out in action plans. Since the 1990s, Energy Efficiency Agreements have been the primary tool in Finland for improving energy efficiency and meeting the strict EU obligations on improved efficiency in energy use. The current set of agreements run from 2017 – 2025 and follow on from the previous agreements running from 2008 – 2016.

In Belgium, from 2003 to 2026 Flanders has allowed industrial companies to participate in voluntary agreements for improving energy efficiency. In Flanders, companies within energy-intensive industries (annual energy demand > 0.1 PJ) are required to implement an energy management system or an ISO 50001 certification. SMEs have access to support for energy audits and subsidies for energy efficiency projects.

Energy Policy Agreement 2023 – 2026 (Flanders)

In November 2002, the Flemish government adopted the benchmarking covenant as an energy policy agreement aimed at large energy-intensive establishments (annual primary energy consumption of at least 0.5 PJ) that fall under the EU ETS. From 2015 onwards, the Flemish government introduced an Energy Policy Agreement (EPA) 2015-2022. The energy policy agreement with the non-ETS companies was intended to help the Flemish Government achieve its climate objectives. Under the EPA, annual reporting of results, monitoring and control was also provided for through the reporting obligations to the verification office²⁰³. The Energy Policy Agreement was extended from 2023-2026 and the target group was expanded to include all energy-intensive companies with a final energy consumption of at least 0.1 PJ. In the new energy policy agreement, companies must follow the following standards:

- An Internal Rate of Return (IRR) threshold is set for profitable/potentially profitable investments:

²⁰⁰ <https://energiateghokkuussopimukset2017-2025.fi/en/agreements/>

²⁰¹ <https://ebo-vlaanderen.be/sites/ebovlaanderen/files/downloads/250416%20Jaarverslag%202023.pdf>

²⁰² <https://energiateghokkuussopimukset.fi/en/agreements/>

²⁰³ [The EPAs | EBO Flanders](#)

Table 2-3 Internal rate of return limit set for energy efficiency investments/measures (Flanders)

Company type	Profitable investments IRR threshold	Potentially profitable investments IRR threshold
EU ETS	12%	10%
Non- EU ETS	10.5%	9%

- The lower IRR thresholds, compared to those required for mandatory investments under the Energy Planning Decree, ensure that companies voluntarily joining the EPA implement energy-saving investments that are additional, i.e. investments that would not be required under other policies due to their relatively low IRR.
- Participating companies must provide data on the heat demand and the residual heat potential of their site(s).
- Non- EU ETS companies carry out a mandatory climate audit in which they look for feasible and cost-efficient CO₂ savings and measures around their own local renewable energy production and electrification before submitting their energy plan²⁰¹.

2.4.2.3 Rationale, intervention logic and addressed barriers

As part of the assessment of the supporting measures towards decarbonisation of ETS2 sectors, the willingness of industry to invest in decarbonisation was cited as a key barrier. The lack of willingness to participate in voluntary energy efficiency agreements are related to the associated incentives and disincentives. With these agreements, incentives were the pull factor for companies while co-definition of goals ensured ownership, and penalties guaranteed compliance. Feasibility is also a key pillar of a voluntary energy policy agreement. The more feasible the energy policy agreement, the more likely that companies will enter them²⁰⁴.

In Finland, participants of energy efficiency agreements can apply for energy subsidies granted by the Government on conventional energy investments, as well as subsidised energy audits for small, medium enterprises (SMEs)²⁰⁰. Rational and efficient energy use cuts costs and adds to operational profitability of industry, which is visible in financial reporting records of companies. Energy efficiency is also a sign of responsibility for companies and target-oriented efficiency attracts the interest of many stakeholders. In Finland, companies included in the agreement that are subject to an environmental permit are not subject to any separate requirements relating to energy efficiency.

Impact of the measure

2.4.2.4 Expected impacts

In Finland, more than 770 companies and 157 municipalities have joined energy efficiency agreements and have implemented more than 27,000 individual energy efficiency measures and invested more than EUR 1,481 million in energy efficiency over two years. The agreements have improved their energy use by a total of 14.8 terawatt hours in 2017-2023. The measures implemented from 2017-2023 are expected to reduce annual CO₂ emissions by 3.1 MtCO₂e. The energy cost savings from the corresponding measures implemented are expected to reach a total of 800 million euros, 81% of which came from measures in heat and fuel²⁰⁵.

From 2017-2023 government support for energy efficiency investments offered through the Ministry of Economic affairs and employment reached 144 million Euros in subsidies. Of which 15.4 million Euros were allocated to energy intensive industry and 32.7 million euros was allocated to medium sized industry. More information on the costs and investments in measures across industry subsectors can be found here. [Results - Energiatohokkuussopimukset 2017–2025](#).

In Flanders, 281 sites have joined the EPAs (2023-2026), 141 under the EU ETS and 140 non-EU ETS. The companies under the agreements have submitted an energy plan with 1,779 measures amounting to planned savings of 13.2 PJ, 95% of which are through measures supporting decarbonisation of fuels and heating. In the energy plan, the companies must also set a reference year as a baseline for calculating energy savings.

²⁰⁴ <https://ebo-vlaanderen.be/nl/de-ebos>

²⁰⁵ <https://energiatohokkuussopimukset2017-2025.fi/en/results/>

The total final energy consumption of the participating companies was 416 PJ based on the reference years they chose (any year from 2019 – 2022, 248 sites chose 2022). This total accounts for approximately 28% of Flanders gross energy consumption. 92% of which fall under the EU ETS (26.8ktCO₂e) and 8% non-EU ETS (2.4ktCO₂e)²⁰¹.

Results for 2023 show that EPA companies achieved savings of 3 PJ which indicates that the new EPAs have had a smooth start, with many companies acceded into agreements, drawing up energy plans and implementing energy efficiency improvement measures. To maintain a guarantee of success under the EPAs the Energy plans submitted are limited to 20 “potentially profitable measures” which are considered higher risk. The IRR for this is highlighted in Table 2-3 above.

2.4.2.5 Scalability

Voluntary Energy Efficiency Agreements can be scaled to include less energy-intensive industries, or other sectors not yet included. These agreements can also be extended beyond the scope of energy efficiency to also include decarbonisation targets. There is no limitation on the application of voluntary agreements across sectors. In the referenced cases from Belgium and Finland, voluntary agreements covered industry, the municipal sector (municipalities and cities) and the property sector (rental and commercial buildings).

In Flanders, the sector organisations operating under the EU ETS and outside of the ETS have joined the energy policy agreement. Some examples include: The federation of the food industry, the Flemish Economic Association, the federation of the chemical industry and life sciences, the professional association of the Belgian textile, wood and furniture industry²⁰⁶.

In Finland, participation is also not limited to specific sectors. Other countries may decide to limit voluntary agreements to specific sectors, depending on decarbonisation priorities and readiness of private actors. In Finland the aim of the energy efficiency agreements is to improve the efficient use of energy within industry, the energy sector, service sector, property and building sector, municipalities, and oil-heated real estates. The Energy Efficiency Agreement for Industries is an agreement between the Government and industrial associations on the efficient use of energy, and companies join the energy efficiency agreement for Industries by signing a separate Accession Document into the action plan of their industrial branch. Action plans have been created for the following industrial branches in Finland: Energy intensive, Food and Drink, Chemical, Technology, Wood Product, Energy Production, Energy services, Motor Trade and Repairs, Commerce, Hotel and restaurants²⁰⁰.

2.4.2.6 Replicability

These measures can be replicated in other countries. Effectiveness will depend on the number of public subsidies that could be provided as part of the agreements as well as a rigorous monitoring and reporting system to ensure the measures implemented by participating industry are both economically viable with a sufficient rate of return and achieve emission reduction targets. Replicability will also depend on the willingness of the private sector to participate in such agreements.

Practicalities around implementation of the measure

2.4.2.7 Speed of implementation

Energy efficiency voluntary agreements take 1–3 years, involving stakeholder negotiations, framework development, and monitoring protocols. Government collaboration with industries ensures measurable commitments. Previous experiences with similar schemes may reduce the time needed for implementation.

In Belgium, Companies wishing to join the Energy Policy Agreement must complete an application form. There are separate application forms for companies under the EU ETS and those that are not covered. The applications are reviewed by the Verification of Flanders. Companies applying must have a primary energy consumption of at least 0.1 PJ²⁰⁷.

In Finland Joining the Energy Efficiency Agreement for Industries means that a company joins one or more Action Plans of the Energy Efficiency Agreement for Industries with a separate accession document. To join the Energy Efficiency Agreement for Industries, the company must send an appropriately filled accession document and the accession details attached to the document to the industry association managing the Action Plan. A company joins the Energy Efficiency Agreement for Industries once the industry association managing

²⁰⁶ <https://ebo-vlaanderen.be/nl/de-ebos/toegetreden-sectororganisaties>

²⁰⁷ <https://ebo-vlaanderen.be/nl/formulieren>

the Action Plan has established that the accession document signed by the company is in due form and the association has submitted a copy of the document to Motiva Ltd to be entered into the participant register. In general, the company must include all of its sites in Finland and their energy use in the Energy Efficiency Agreement for Industries. If necessary, the company can join one or more Action Plans^{208,209}.

2.4.3 Case Study: Energy audits

Overview of the measure

2.4.3.1 Objectives and scope of the measure

Energy audits usually complement broader national policies that include financing schemes and decarbonisation targets. Energy audits are an effective tool for providing accurate information on energy consumption and processes. Often, energy audits are complemented by guidance on actions to improve energy efficiency. Currently, the Energy Efficiency Directive mandates energy audits for all large enterprises and for all enterprises with an average annual energy consumption higher than 10 TJ, regardless of their size.²¹⁰ These audits must be carried out by independent experts (or supervised by independent authorities) with the first audit to be completed by October 11, 2026.

Energy audits help provide enterprises and responsible authorities with a regular review of the energy performance of buildings, operating processes and industrial/commercial facilities. They include various analyses including consumption profiles and assessments of energy performance of different processes. They identify and quantify opportunities for cost-effective energy savings, and all the results are detailed in a report. It is essential that the recommendations that are technically feasible and cost efficient are transposed and taken to implementation.

2.4.3.2 Geographic scope

Energy audits are implemented in multiple EU MS. Below are some specific examples from Ireland, Austria and Finland:

Support Scheme for Energy Audits (SSEA) - Ireland

The Sustainable Energy Authorities of Ireland's (SEAI) Support Scheme for Energy Audits (SSEA) offers SMEs a €2,000 voucher towards the cost of an energy audit. In most cases, this will cover the total cost of the audit. Application to the scheme is easy, with automatic approval for eligible businesses. SMEs that participate in the programme receive targeted support to improve energy efficiency including advice and mentoring from a specialist including a site assessment for companies with a significant energy spend, training in energy management for groups of SMEs, and online energy management tools²¹¹. In Ireland, businesses that apply to receive an energy audit must be tax compliant, registered in the Republic of Ireland and spend at least 10,000 euros on energy (excluding transport costs) per year at the site being audited in order to receive a voucher to partake in an energy audit. In Ireland, the grant for energy audits is for businesses that do not fall under the scope of Article 8 of the Energy Efficiency Directive (SMEs)²¹².

Federal Energy Efficiency Act - Austria

In Austria, energy audits for SMEs are supported by the Federal States and are carried out by trained and independent auditors. The Austrian Federal States have their own audit programmes each with a network of energy consultants. To push the implementation of recommendations of energy audits, the Austrian Federal Energy Efficiency Act stipulates that in their energy audit reports, enterprises must document which recommendations from a previous energy audit report have been implemented or not. If recommendations from a previous energy audit report have not been implemented, they must explain why. In 2024, around 4,900 enterprises in Austria were covered by an energy audit/management system²¹³.

²⁰⁸ <https://energiatohokkuussopimukset2017-2025.fi/wp-content/uploads/2020/02/Energy-Efficiency-Agreement-for-Industries-2017-2025.pdf>

²⁰⁹ [Energy Efficiency Agreements - Energiatohokkuussopimukset 2017-2025](#)

²¹⁰ [Energy Efficiency Directive](#)

²¹¹ [Energy Audits for SMEs | Business | SEAI](#)

²¹² [SSEA-Applicant-Guidance.pdf](#)

²¹³ This information was provided by the Member State.

Energy Audit program - Finland

Energy auditing has been one of Finland's main energy conservation tools. They have been mentioned in all the national climate strategies since 1992. Finland's Energy Audit Programme (the EAP) started as a subsidy policy in 1992, which was developed into a programme in 1993 and launched in practice in 1994. The EAP is a full-scale programme consisting of the following elements: programme administration, detailed guidelines, auditor training and authorisation as well as a monitoring system and promotion activities. The EAP is a voluntary programme but promoted by a subsidy to cover 40-50% the labour costs of the audit for industrial participants, run by the Ministry of Economic Affairs and Employment (MEAE)²¹⁴. Since 5 June 2014 large companies have not been receiving subsidies for audits because they are within the sphere of mandatory audits required by the Energy Efficiency Directive²¹⁵.

2.4.3.3 Rationale, intervention logic and addressed barriers

The importance of energy audits stems from the fact that individuals and companies are often not fully aware of their potential to improve energy efficiency in their activities, production processes, and so on. These measures partially or fully cover the costs of energy audits, thus promoting and encouraging the use of a tool that helps companies explore opportunities to reduce their energy consumption. This can lead to lower expenses for businesses, especially when improvements can be implemented without further investment, and to reduced energy use and related emissions.

These measures therefore address both the lack of awareness and the cost barriers associated with energy audits. In addition, they also help solve the issue of the shortage of skilled technical staff to carry out energy audits, thanks to the training of such professionals.

Impact of the measure

2.4.3.4 Expected impacts

Energy audits have a number of significant benefits for companies falling under ETS2. They help create an understanding around energy use, through learning about where energy is used, how it is wasted and how its usage can be made more efficient. They help small business understand the low-cost changes to make immediate energy savings, increase competitiveness, and reduce exposure to energy price fluctuations and in this instance, the effects of ETS2. All these benefits help to increase brand reputations²¹¹. This measure can support numerous sectors, but in particular the benefits can be felt for small industries, with higher impacts on those recipients which lack internal skills/resources and technical knowledge.

- In Austria Annual savings for 2020 are estimated to have been 15.78 kt CO₂ because of energy audits²¹⁶.
- In Ireland, Energy savings achieved in 2010 are equal to 180 GWh. Energy savings for 2020 are estimated to be 505 GWh.
- In Finland, subsidised energy audits have been an effective way to improve efficient energy use and increase renewable energy. The energy cost savings as a result of energy audits in the SME industry have been as much as 27%²¹⁷. In the period between 1992 and 2004, the total costs of audits and subsidies amounted to 60 million euros.²¹⁸

These measures are expected to interact with policies aimed at increasing awareness and at providing financial support for decarbonisation. In Finland, financial support for energy audits is bigger if the company has joined a voluntary energy efficiency agreement. Some of the success stories from energy audits on specific industries can be found here, [Results of energy audits in Finland - Motiva](#), including secondary benefits from an audit on the Porokylä bakery in Nurmes, where the energy audit not only resulted in energy savings, but also improved energy skills of the personnel, working conditions and the quality of the production process²¹⁹. The energy audit of Scantarp Oy, a Kuopio-based manufacturer of protective fabrics, highlighted good short- and long-term development targets. Results include the replacement of the refrigeration compressor with a heat pump, upgrade of electric motors and mapping out a solution to substitute fuel oil²²⁰.

²¹⁴ [Supported energy audits - Motiva](#)

²¹⁵ [Energy Efficiency Policies & Measures Database, Graph and Summary Table](#)

²¹⁶ [Energy Efficiency Policies & Measures Database, Graph and Summary Table](#)

²¹⁷ [Supported energy audits - Motiva](#)

²¹⁸ [Energy efficiency in the Nordics](#)

²¹⁹ [Energy audit brings savings and co-benefits to Porokylä bakery - Motiva](#)

²²⁰ [Scantarp Oy: Energy audit provided new ideas and support for one's own plans - Motiva](#)

2.4.3.5 Scalability

Measures supporting energy audits can be expanded provided that sufficient public funding is available to subsidise the audits. Other sectors outside of industry, may benefit from increased support for energy audits, although the scalability of the measure will ultimately depend on auditor availability. Energy audits typically focus on energy efficiency only, however the case of Finland highlights that the scope of audits can also be expanded to optionally include the identification of decarbonisation opportunities. An energy audit can cover a property, transport chain or an entire municipality (municipal renewable energy audit).

In the building sector energy audits aim to increase the efficiency of the property's energy consumption by investigating the chances for energy conservation and the utilisation of renewable energy. The energy audits of transport chains are comprehensive investigations of the transport chains of freight traffic and particularly beneficial for those who procure transport services, such as municipalities and cities. While a municipal renewable energy audit investigates a municipalities or city's opportunities for using renewable energy in the heating of properties and electricity production within its area²²¹. As such the flexibility around the implementation of energy audits in general is vast and the case of Finland, this coverage demonstrates the opportunity for a cultural shift towards energy audits for improving energy efficiency.

In terms of the types of energy audits that can take place, they may be carried out on buildings, processes, or systems and it is generally a three-step process which involves preparation, a site visit and reporting²¹¹.

2.4.3.6 Replicability

These measures can be replicated across the EU with high benefit potential as most SMEs across Europe do not perform voluntary energy audits. Article 8 of the Energy Efficiency Directive (EED) only puts mandatory requirements on larger companies to undertake energy audits every 4 years. Other Member States could also leverage past experience with energy audit programmes in other sectors.

Practicalities around implementation of the measure

2.4.3.7 Speed of implementation

Measures supporting energy audits can be implemented within 6 months to 3 years, depending on their scope and complexity. The speed of conducting energy audits ultimately depends on the availability of trained auditors, while digital consultations can help accelerate the process.

2.4.4 Case Study: Provision of external support

Overview of the measure

2.4.4.1 Objectives and scope of the measure

Several EU Member States have established external support programmes to help businesses strengthen internal capacities for energy efficiency and decarbonisation. The primary objective of these measures is to enhance companies' internal skills and awareness, enabling them to identify, plan, and implement energy-saving actions. This is achieved through a mix of awareness campaigns, technical training, energy audits, advisory services, and strategic planning support.

The scope of these programmes varies widely. Some focus on general awareness-raising and sector-specific training - such as Austria's Klimaaktiv Betriebe and Cyprus' annual campaigns - while others offer more structured and comprehensive support. France's PACTE Industrie programme, for example, combines subsidised training (up to 80%), energy audits (up to 70%), and support for ISO 50001 energy management systems, complemented by strategic planning assistance and additional financial.²²² Sweden's network-based model also promotes long-term collaboration among industrial actors, further embedding energy efficiency practices within firms.²²³

These measures collectively target a broad range of stakeholders, including SMEs, large companies, and in some cases, end consumers, aiming to close internal knowledge and capacity gaps that hinder effective energy management.

²²¹ [Energy Auditing - Motiva](#)

²²² [Industriels, découvrez le programme PACTE Industrie | Entreprises | Agir pour la transition écologique | ADEME](#)

²²³ [Energig - Energy efficiency networks](#)

2.4.4.2 Geographic scope

The measures described here are implemented in Austria, Cyprus, Finland, Sweden, and France, although other European countries have also developed support programmes targeting SMEs - or, more broadly, businesses and consumers - in the areas of energy efficiency and renewable energy use.

While all these initiatives share the common goal of promoting energy efficiency and decarbonisation, they differ in terms of delivery mechanisms, target groups, and the level of support provided. Some focus primarily on awareness-raising and capacity-building while others adopt more structured approaches with financial support and a stronger emphasis on technical detail.

2.4.4.3 Rationale, intervention logic and addressed barriers

A key barrier to industrial energy efficiency - especially among SMEs - is the lack of manpower, internal expertise and technical knowledge. These programmes aim to overcome this challenge by offering external support in the form of training, audits, and expert advice. By doing so, they help firms address informational and organisational barriers that often hinder the identification and implementation of cost-effective energy-saving measures.

For example, Cyprus organises a range of initiatives targeting a broad audience (not limited to SMEs) with the goal of raising awareness about energy efficiency opportunities and the adoption of renewable energy sources. These initiatives are less technical in nature and serve primarily to establish initial contact with potential beneficiaries, guiding them toward available support schemes.

A similar approach is taken by Finland's Regional Energy Counselling programme, which is directed at consumers, municipalities, and SMEs. It operates on the principle of providing an energy advisor in each Finnish region. These advisors deliver support through various channels, including personal consultations, seminars, public meetings, and information campaigns.²²⁴

France's PACTE Industrie exemplifies a more technical and comprehensive model, combining financial incentives with structured training, audits, and strategic planning support. In many cases, these measures operate in synergy with financial support schemes, enhancing their reach and overall effectiveness.²²⁵

Impact of the measure

2.4.4.4 Expected impacts

These programmes are generally effective in raising awareness, building internal capacity, or providing support for energy management. However, quantifying their precise impact remains challenging due to the diffuse nature of soft measures such as information campaigns, training, and workshops.

In Cyprus, for example, the implementation of soft measures is estimated to result in an energy consumption reduction of approximately 0.21 TJ.²²⁶ In Finland, as part of the Regional Energy Counselling programme, 465 energy consultations were conducted within the first five months of 2021. A follow-up survey among participants indicated an estimated impact of 2,900 MWh/year in energy savings and renewable energy deployment, with a potential reduction of 900 tonnes of CO₂ per year.²²⁷ Free advisory services are available to SMEs in key sectors such as food, technology, chemicals, tourism, and hospitality. More targeted support is also provided to firms participating in voluntary energy efficiency agreements.²²⁸

In Sweden, participation in energy efficiency networks has shown significantly greater results compared to standard audit support: participating firms achieved energy savings of around 16%, compared to 3–9% for firms not involved in the networks.²²⁹

France's PACTE Industrie is expected to deliver 1–2 TWh/year in energy savings. Although this represents a modest share of total industrial consumption, the measure is notable for its structured and strategic approach. It has been allocated a €49 million budget for the 2023–2026 period.²³⁰

²²⁴ [Regional energy counselling | Energiavirasto](#)

²²⁵ [Industriels, découvrez le programme PACTE Industrie | Entreprises | Agir pour la transition écologique | ADEME](#)

²²⁶ [Cyprus energy efficiency & Trends policies | Cyprus profile | ODYSSEE-MURE](#)

²²⁷ [Regional Energy Counselling](#)

²²⁸ [Free advice - Energy Efficiency Contracts 2017-2025](#)

²²⁹ [Energinet - Energy efficiency networks](#)

²³⁰ [Industriels, découvrez le programme PACTE Industrie | Entreprises | Agir pour la transition écologique | ADEME](#)

Public financial contributions generally cover the costs of producing and distributing informational materials, as well as organising training sessions and workshops. While France continues to invest significantly in such programmes, Sweden has phased out public subsidies for industry networks. Nonetheless, these programmes often operate in synergy with other policies (e.g., energy audits), enhancing their reach and reinforcing broader decarbonisation objectives.

2.4.4.5 Scalability

These measures are highly scalable. Awareness campaigns and training programmes can be expanded effectively through increased budgets and targeted outreach. In particular, social media offers an efficient channel for engaging a wider audience, especially when conveying high-level, non-technical information that encourages participation and awareness.

For more specific forms of communication, such as technical training and workshops, scalability largely depends on financial resources and the availability of qualified technical advisors. Insights from a webinar with associations representing the small industry sector confirmed the importance of training, particularly for small enterprises. Language accessibility emerged as a critical factor, suggesting that these programmes should be implemented at the national level, or adapted to regional and local contexts where necessary. Cross-sector scalability is also high for these measures. Awareness-raising initiatives do not need to target the industrial sector specifically but can be effectively directed at households, businesses, and public entities.

In the case of energy efficiency networks, the same webinar highlighted their positive impacts but also noted the importance of sector-specific organisation. Tailoring networks to specific industrial sectors ensures that participating firms receive relevant and actionable information. This aligns with the Swedish experience, where multiple networks were developed, each focused on a distinct sector such as aluminium or steel.

Structured programmes like France's PACTE Industrie are also scalable. Their expansion can be achieved by training more advisors and widening the scope of eligible participants. Components such as energy audits and ISO 50001 support can be extended to sectors beyond industry, further increasing the programme's reach.

2.4.4.6 Replicability

External support programmes are easily replicable across EU Member States. Their modular design allows for adaptation to national contexts, taking into account differences in industrial structures, company sizes, and existing levels of technical capacity. Replication is particularly valuable in countries where SMEs represent a large share of the economy and where voluntary adoption of energy audits and management systems remains limited.

Practicalities around implementation of the measure

2.4.4.7 Speed of implementation

The implementation timeline varies depending on the programme's complexity and scope. Awareness campaigns and training initiatives generally require 6 months to 3 years to design and launch. Awareness-raising initiatives can be implemented relatively quickly and may benefit from the use of common online social platforms. In these cases, the main time requirement concerns the development of the content to be shared. Where the approach involves direct engagement with targeted stakeholders – such as through in-person events – the organisation of such activities, including the necessary staffing, may take longer.

The implementation of more structured programmes, such as France's PACTE Industrie, requires additional time. This is necessary to establish an appropriate framework (typically based on regulatory provisions) that can manage applications, assess eligibility, and deliver the proposed funding and services. In such cases, it is essential to consider from the outset the availability of auditors and technical experts, relative to the expected volume of applications. A mismatch between supply and demand may lead to further delays in implementation.

2.4.5 Case Study: National investment funds supporting research and innovation (R&I) and demonstration projects

Overview of the measure

2.4.5.1 Objectives and scope of the measure

Member States have established these programmes to focus on supporting the development and deployment of innovative technologies that reduce greenhouse gas emissions and improve energy efficiency. The

measures primarily take the form of grants and subsidies, targeting new technologies ranging from the inception phase to the demonstration stage. The programmes aim to facilitate the large-scale deployment of new decarbonisation solutions.

These investment programmes are designed to stimulate innovation and take up in a wide range of sectors and technologies, including low-carbon hydrogen, electrification of industrial processes, biomass-based heat, carbon capture and storage (CCUS), and circular economy solutions. The targeted stakeholders are companies (both SMEs and larger enterprises) as well as, in some cases, public entities involved in research around energy and environment (such as universities).

National investment funds can be seen as complementary to broader EU-level funding instruments such as Horizon Europe or the Innovation Fund. These EU-level funds support projects with European added value and, in the case of the Innovation Fund, typically target technologies with higher technology readiness levels. In contrast, national funds often focus on technologies at earlier stages of development. This complementarity is reflected in the possibility for researchers and companies to access co-financing, obtaining support from both EU and national sources (subject to specific co-financing rules), as well as in the broader range of initiatives that can receive financial support, whether from EU or national funds.

2.4.5.2 Geographic scope

These measures presented here are implemented in France, Germany, Ireland, and the Netherlands. While all aim to support industrial decarbonisation, their approaches differ in terms of technology focus, funding mechanisms, and administrative structures. These programmes may differ significantly in terms of research areas covered, grant size, total budget and technology readiness levels (TRL) supported.

2.4.5.3 Rationale, intervention logic and addressed barriers

A common barrier across Member States is the availability of innovative solutions to decarbonise industrial processes. In some cases, such solutions are available but are either too expensive to be considered and implemented (and this may be particularly true for SMEs which have tighter budgets) or in the early stages of their development, which require additional investment for the testing and for making sure technology in question could have the desired impact.

These programmes address this gap by providing targeted financial support to de-risk investments and accelerate deployment. For instance, Germany's Federal Funding for Industry and Climate Protection (BIK) is designed to focus on support of technologies that are in specific Technology Readiness Levels (TRL), as they are defined in EU regulations. Specifically, BIK supports technologies with TRL equal or higher than 4 (i.e., the technology has been tested in the laboratory) and TRL equal or lower than 8 (i.e., the system is complete and qualified).²³¹

This approach is flexible and can be modified to suit specific industry conditions. Support programmes, such as the schemes here presented, may target different TRLs depending on the time horizon of national objectives. For example, targeting lower TRLs may incentivise innovation in the first stages (i.e., research), where results are potentially far in the future. On the contrary, where decarbonisation objectives may be stringent, support programmes can be designed to target innovations with higher TRLs (i.e., the development and deployment), that may need funding for the final stages of their testing and commercialisation at scale.

Impact of the measure

2.4.5.4 Expected impacts

Being designed to support innovation and research, these programmes often do not come with specific targets in terms of energy or emissions savings. As an exception, Germany's BIK programme aims to reduce emissions by 40 million tonnes of CO₂e by 2045.²³²

Programmes to support research and development are often part of broader programmes. For instance, Germany's BIK programme does support both climate-friendly investment (in industry) and research,

²³¹ [FAQ | Competence Centre for Climate Protection in Energy-Intensive Industries \(KEI\)](#)

²³² [Federal Funding for Industry and Climate Protection: Module 1 | Competence Centre for Climate Protection in Energy-Intensive Industries \(KEI\)](#)

development and innovation in industry.²³³ The same applies for France's PEPR SPLEEN, as that is part of the broader France 2030 Plan.²³⁴

Public investment varies significantly across programmes. France allocated €70 million over six years for PEPR SPLEEN.²³⁵ Germany has allocated €3.3 billion for BIK²³⁶, covering both investment and R&D, running until 2030. In Ireland, the National Energy RD&D Programme funded over 240 projects between 2018 and 2023, with €75 million invested.²³⁷ In the Netherlands the DEI+ programme has supported around 400 projects since 2014, with €540 million in grants that coupled with private investment led to €1.76 billion in total investments in research.²³⁸ For the 2025, the programme has a budget of €175 million.²³⁹

Innovative technologies and solutions developed as part of these projects could impact other sectors, industries, or, more broadly, communities. This is due to the potential for adapting specific technologies to different uses and contexts, or to the creation of an innovative environment that incentivises research in related fields.

While these measures are not directly linked to the EU Innovation Fund, national contact points, the designated entities in each Member State that provide support and information on the functioning of the Innovation Fund, usually offer guidance to interested companies, directing them towards the most suitable supporting initiative, whether national or EU wide, based on their needs and goals.

2.4.5.5 Scalability

These measures are scalable but should focus on technologies with high emissions reduction potential and readiness for deployment to maximise positive impacts in the short term. France's and Germany's programmes are structured to support research activities at different TRLs. These requirements can be adapted to match the situation in specific sectors, so that the funding is in line with the industry needs.

All schemes here presented outline specific areas that are eligible for funding (e.g., clean hydrogen, energy infrastructure, etc), although these areas are subject to changes and can be expanded to include additional technologies as market conditions evolve. For example, in Ireland's RD&D programme the topics for which funding is available are revised each year following cross-Government consultation run by the SEAI, which ensures that the funding is highly targeted.²⁴⁰

Another way to increase the scale of national investment funds supporting R&I is to increase the amount of resources to be dedicated to research, while still conducting checks on the quality of the projects brought forward to ensure that the money is well placed.

Additionally, these programmes can offer support before an application is submitted. For example, the Netherlands' DEI+ programme offers the opportunity for stakeholders to discuss their project idea and its feasibility.²⁴¹ This ensures a wider range of stakeholders can access these funding opportunities, including small and medium enterprises which may be less familiar with funding opportunities for research.

2.4.5.6 Replicability

These policies are highly replicable across the EU, particularly in countries with strong innovation ecosystems. Key enablers for replication include sufficient public funding, administrative capacity, and alignment with national climate strategies. France's emphasis on coordination between national and EU funding could serve as a model for other Member States seeking to maximise the impact of public investment.

Practicalities around implementation of the measure

2.4.5.7 Speed of implementation

The speed of implementation varies across Member States, depending on programme design and administrative readiness. France's PEPR SPLEEN was launched in 2023 and began mobilising projects within

²³³ [Bundesförderung Industrie und Klimaschutz: Modul 1 | Kompetenzzentrum Klimaschutz in energieintensiven Industrien \(KEI\)](#)

²³⁴ [PEPR Spleen - PEPR Spleen](#)

²³⁵ [National research programme Decarbonisation of the industry \(PEPR SPLEEN\) | CNRS](#)

²³⁶ [Federal Funding for Industry and Climate Protection \(BIK\) | FI Group](#)

²³⁷ [Ireland's integrated National Energy and Climate Plan 2021-2030](#)

²³⁸ [Demonstration of Energy and Climate Innovation \(DEI+\) | RVO.nl](#)

²³⁹ [DEI+: Energy and Climate Innovations | RVO.nl](#)

²⁴⁰ [Ireland's integrated National Energy and Climate Plan 2021-2030](#)

²⁴¹ [DEI+: Energy and Climate Innovations | RVO.nl](#)

the same year, reflecting a relatively swift setup for a research-focused initiative.²⁴² Germany's BIK programme was launched in August 2024, with the deadline for applications being the 30 November 2024 for the first call. Results of the initial review were shared in February 2025. Successful candidates have time until May 2025 to submit full applications, with approval notifications expected by the end of September 2025.²⁴³ Ireland's SEAI RD&D programme operates on an annual cycle, enabling rapid deployment of funds within months of each call.^{244, 245}

The actual implementation time of these measures should take into account not only the time needed to set up the system for collecting, evaluating, and approving funding requests, as well as the systems for disbursing subsidies and performing anti-fraud checks, but also the time required for the supported research projects to deliver their results. The innovative technologies/solutions must then be deployed in order to generate their effects, with timelines that vary significantly depending on the type of solution.

As mentioned earlier, one way to increase the likelihood that these measures will have an impact in the short to medium term is to concentrate significant resources on technologies that are already at an advanced stage of research, but still require additional support for the final phases of testing and/or commercialisation.

3. HIGH POTENTIAL MEASURES FOR THE FUTURE

This section identifies three measures, of which two were discussed in detail during the workshop with key stakeholders on the 6th May 2025 for the Buildings sector. These measures are considered to have significant potential and represent promising approaches. There remains a need to obtain more information on the measures, as well as on their replicability and effectiveness in reducing emissions.

During the webinar, the importance of addressing the social and distributional aspects of decarbonising the buildings sector was highlighted, along with the challenges posed by renovations in condominiums due to split incentives – challenges that these two selected high-potential measures could at least partially address.

The third measure (on the importance of developing cycling infrastructure to incentivise modal shift) was added due to the importance attributed to modal shift in the decarbonisation process. Although such measures may have limited effects in the short term, they can produce a significant impact by encouraging more sustainable modes of transport, and producing a number of co-benefits, such as reduced air pollution and improved health conditions.

3.1.1 Leasing of heat pumps

A potential best practice measure for the future is the (social) leasing of heat pumps. Currently, several European countries have implemented measures aimed at encouraging the replacement of heating systems powered by fossil fuels with more efficient and environmentally friendly alternatives, such as heat pumps. These support measures range from financial aid for the purchase and installation - where the purchase is subsidised by local or national governments through grants or low-interest loans²⁴⁶ - to initiatives focused on increasing public awareness of heat pumps and addressing reputational issues that hinder their broader adoption.

Leasing is a potential solution because it helps overcome one of the main barriers to wider deployment, which is the high upfront investment required to purchase and install a heat pump.²⁴⁷ Leasing, or a general subscription-based model, eliminates this initial financial burden for the consumer by allowing the installation costs to be spread over time. It also guarantees access – ensured through contractual agreements – to regular maintenance of the equipment. Furthermore, the flexibility of the leasing model allows it to be used in both the building sector, for heating and cooling residential and commercial buildings, and in the industrial sector, where

²⁴² [PEPR Spleen - PEPR Spleen](#)

²⁴³ [New Funding Policy for Germany's Carbon Management Strategy](#)

²⁴⁴ [Ireland's integrated National Energy and Climate Plan 2021-2030](#)

²⁴⁵ [Research, Development & Demonstration Fund | Research Funding | SEAI](#)

²⁴⁶ [Heat pumps on subscription | ClimateXChange](#)

²⁴⁷ [Preferences of homeowners for heat-pump leasing: Evidence from a choice experiment in France, Germany, and Switzerland - ScienceDirect](#)

up to 37% of heat demand could potentially be met by heat pumps.²⁴⁸ A study conducted in France, Germany, and Switzerland revealed varying levels of preference for leasing over purchasing a heat pump. In Switzerland, only one in three households would opt to lease a heat pump, a figure that rises to nearly one in two in France, and up to two in three in Germany. According to the study's authors, leasing could be particularly appealing in contexts where the low market penetration of heat pumps is combined with concerns about their reliability and performance.²⁴⁹

The social aspect of leasing involves increased attention to low-income groups, with governments potentially covering part or all the leasing costs, integrating government support directly into leasing contracts. This could be easily implemented, by subsidising the lease fee, which can also be adjusted based on the beneficiary's income.

Another advantage of leasing is its ability to offer a certain level of cost predictability. Furthermore, unlike other schemes (such as on-bill financing), this model shifts the risk away from the heat pump user (i.e., the household or company). The leasing company takes on responsibility for the system's performance and maintenance. This can be particularly useful in contexts where households and businesses have doubts about the performance and reliability of heat pumps.

The big question for (social) leasing and similar financing models is who is paying and guaranteeing to buy the stock of appliances to be paid overtime in e.g. a special purpose vehicle or similar (startups obviously cannot put this on their balance sheets and manufacturers do not want to do it either). The rest are details to be calibrated among the main disadvantages of this solution are the contractual challenge of managing payment defaults. As with any heat pump installation, there is a need for installers. An increased deployment of heat pump calls targeted education, training and upskilling initiatives and all-in business models that integrate appliance, installation and maintenance.

This measure could represent a promising best practice for the future; however, it has not yet been implemented in practice in its social version, and its actual effectiveness will need to be assessed once pilot schemes or broader applications are launched.

3.1.2 Carbon Dioxide Sharing Act

The Carbon Dioxide Cost Sharing Act is a measure implemented in Germany on January 1st, 2023. Under the Fuel Emissions Trading Act (BEHG), utility companies that import and distribute fossil fuels are required to pay a carbon price. This cost is typically passed on to end consumers, in the building sector resulting in higher expenses for heating and hot water.²⁵⁰ The Carbon Dioxide Cost Sharing Act addresses this by introducing a mechanism that allocates these carbon costs between landlords and tenants, depending on the energy efficiency of the building.

For residential buildings and buildings that are mainly residential, the allocation of CO₂ costs follows a ten-stage model based on the building's annual emissions per square meter of living space. Landlords are required to calculate and disclose both the CO₂ costs and the distribution key as part of the annual heating cost statement. In buildings emitting more than 52 kilograms of CO₂ per square meter annually the landlord must cover 90 percent of the carbon costs, with the tenant responsible for the remaining 10 percent. Conversely, in energy-efficient buildings emitting less than 12 kilograms of CO₂ per square meter per year, the tenant bears the full CO₂ cost.²⁵¹ If the tenants are directly responsible for procuring the fuel they are entitled to claim reimbursement from their landlord. The claim must be submitted within twelve months from the date of the supplier's final invoice for the delivered fuels.²⁵²

The rationale behind this system is twofold. First, if CO₂ costs increase it incentivises landlords to invest in improving the energy efficiency of their properties, as they bear a larger share of carbon costs for inefficient buildings. Second, when buildings are already energy-efficient, tenants - who are responsible for the full carbon cost - are encouraged to adopt energy-saving behaviours to manage their heating and hot water expenses. With regard to the challenges associated with this measure, the incentive to renovate buildings has been low

²⁴⁸ [A visual explainer: how industrial heat pumps power net-zero industry – European Heat Pump Association](#)

²⁴⁹ [Preferences of homeowners for heat-pump leasing: Evidence from a choice experiment in France, Germany, and Switzerland - ScienceDirect](#)²⁴⁷²⁴⁷.

²⁵⁰ [New Costs For Landlords Due To Carbon Dioxide Cost Allocation Act | Insights & Resources | Goodwin](#)

²⁵¹ [The CO2 Cost Sharing Act - Relief for Tenants - KPMG-Law](#)

²⁵² Ibid.

so far, due to the low CO₂ costs. Regarding the replicability, implementing this approach in other countries may be challenging due to substantial differences in rental legislation and housing markets. Additionally, the interaction with existing national policies must be carefully assessed to avoid unintended consequences. One such risk is circumvention: landlords might respond by increasing rents, thereby transferring the carbon cost burden back to tenants without making meaningful energy efficiency improvements. Addressing such risk may require the implementation of additional measures, designed to align with the country-specific context.

Nonetheless, the German model shows promise. By balancing economic responsibility between landlords and tenants while encouraging behavioural and structural changes, it presents a potentially equitable and effective mechanism. If successfully implemented and adapted to local contexts, it may serve as a best practice for climate policy in the residential building sector.

3.1.3 Cycling infrastructure development in Bordeaux and target setting

As part of their efforts to decarbonise the transport sector, many cities are working to encourage a modal shift toward more sustainable modes such as public transport and bicycles. In Europe, several cities have already achieved significant results. For example, Copenhagen and Amsterdam have long been recognised as global leaders in cycling infrastructure and culture. In recent years, and especially in response to the COVID-19 pandemic, many urban centres have accelerated their investment in cycling infrastructure.²⁵³ Cycling is increasingly viewed as a key tool for climate action, particularly given that transport is responsible for around 29% of all GHG emissions in the EU, with road transport being the largest contributor. While bicycles are not completely emission free over their full life cycle, due to the impacts of production, maintenance, disposal, and batteries in electric bikes, studies estimate that life cycle emissions from cycling are approximately 90% lower per passenger kilometre than those from private cars.^{254 255} Despite these measures potentially affecting only a fraction of total urban transport (at least in the short term), the difference in emissions between bikes and cars could still lead to a significant reduction in overall emissions.

Across the EU, many cities have increased their efforts to promote cycling as an alternative to private cars. For example, Bordeaux (where road transport accounts for a quarter of GHG emissions and two-thirds of the urban air pollution²⁵⁶) has embarked on a structured path to promote cycling, also participating in the European Union CIVITAS Handshake project, which supports cities of all sizes in improving cycling infrastructure and communication strategies.

Since then, the city has undertaken a broad range of investments. More than 15,000 bike racks have been installed since 2020, alongside the introduction of new services such as bike sharing systems, loan services, repair stations, and targeted communication campaigns.²⁵⁷ **One particularly ambitious goal is to increase the modal share of cycling in the metropolitan area²⁵⁸ to 18 percent by 2030, up from 8 percent in 2023 and just 4 percent in 2009.** Central to Bordeaux's strategy is the development of a dedicated cycling network called the Réseau Vélo Express, or ReVE. This consists of 14 main cycling corridors covering a projected 272 kilometres of protected, continuous lanes with dedicated signage and safety measures. These main routes are complemented by local cycle infrastructure and services. In the metropolitan area, over the past four years, more than 36 kilometres of new cycle lanes have been added. Between 2020 and 2024 alone, the number of cyclists in Bordeaux increased by 29 percent.²⁵⁹

The Bordeaux model illustrates how a comprehensive approach combining infrastructure improvements, especially the continuity and safety of bike paths, parking facilities, integration with other transport modes both public and private, and sustained communication, can lead to tangible shifts in travel behaviour.

Importantly, the positive effects of increased cycling go beyond emissions reduction. Active mobility contributes to improved air quality, reduced urban congestion, and better public health outcomes, thanks to increased levels of physical activity. A study on active commuters analysed health benefits on a sample of around 82 thousand people, and found that cyclist commuters are associated with a 47% lower risk of death from any cause, 10% lower risk of any hospitalisation, 24% lower risk of hospitalisation for cardiovascular diseases

²⁵³ [The great bicycle boom of 2020](#)

²⁵⁴ [The climate change mitigation effects of daily active travel in cities - ScienceDirect](#)

²⁵⁵ [Ökologische Bewertung von Verkehrsarten](#) - Ecological assessment of different types of transport

²⁵⁶ [Vélo et marche : des modes de déplacement doux dans une ville apaisée | Site de la ville de Bordeaux](#)

²⁵⁷ [Bordeaux, une ville apaisée et piétonne : un nouveau modèle de mobilité urbaine](#)

²⁵⁸ The modal share of cycling in Bordeaux was 13%, as of 2023.

²⁵⁹ Ibid.

(CVD) and 30% lower risk of receiving a CVD related prescription, 24% lower risk of cancer hospitalisation , 51% lower risk of cancer death, and a 20% lower risk of receiving a mental health related prescription.²⁶⁰ These health and environmental co-benefits make cycling both a climate solution and a way to create healthier and more liveable cities.

²⁶⁰ [Health benefits of pedestrian and cyclist commuting: evidence from the Scottish Longitudinal Study | BMJ Public Health](#)

4. ANNEX 1- DETAILED METHODOLOGICAL APPROACH

Annex 1 provides an in-depth summary of the methodological approach to the study. Including the initial steps taken to identify key challenges and barriers, along with actions to prioritise this list. The process behind the collection of a long list of measures corresponding to selected challenges/barriers, under subsection 4.2 is also outlined in detail, followed by key stakeholder engagement activities used to verify the ranking of measures by sector experts in subsection 4.3 and the final development process of the best practices in subsection 4.4.

4.1 IDENTIFICATION OF CHALLENGES AND BARRIERS

Initially desk-based research was undertaken to collect a large list of barriers and challenges to decarbonise the sectors covered by ETS2, namely road transport, buildings, and other sectors (small industry <20MW). In total 82 challenges/barriers were identified in the long list.

This culminated in a workshop with internal sector experts from Ricardo and Oeko-Institut to identify the most actionable challenges in the short term (3-5 years). The workshop also presented an opportunity to discuss any potential missed barriers/challenges for each of the sectors covered by ETS2.

The aim of step 1 was to present the prioritised challenges/barriers were presented in systems maps (one for each subsector) with up to 3 main barriers/challenges per system map, ~3 systems map per sector – culminating in up to 27 challenges to be taken forward in Step 2 of the assessment. While there are a larger number of barriers and challenges to promote decarbonisation in the ETS2 sectors, the aim was to take 3 main barriers/challenges forward to condense the number of applicable measures, in-line with the final objectives of the study to develop 21 best practices.

Based on the research for challenges and barriers carried out, the number of actionable challenges and systems maps is spread slightly differently across the sectors. In total there are 7 systems maps with 82 identified challenges across the main ETS2 sectors (although this includes some repetition across subsectors). A priority list was drawn from this long list of barriers and challenges during a workshop with internal expert. The list of 31 prioritised barriers and challenges are highlighted in Table 4-1 below.

For transport there were 9 prioritised challenges/barriers identified across 2 systems maps: Personal Transport/Modal Shift and Freight Transport. For buildings there were 12 challenges/barriers identified across 2 systems maps: Low carbon heating – heat pumps and Energy demand. For industry there are 10 challenges/barriers identified across 3 systems maps: Willingness, Feasibility and Regulation.

Table 4-1 Prioritised barriers and challenges

Sector	Systems map	Prioritised challenge/barrier
Road Transport	Personal Transport/modal shift	- Significant remaining lifetime of existing stock - Higher TCO of EVs - Lack of EV charging infrastructure - Significant remaining lifetime of existing stock - Misinformation and poor perception of EV performance - Relatively high cost of using public transport - Insufficient supply of public transport
	Freight Transport	- Lack of knowledge on fuel efficient driving - Lack of interest - Higher TCO of EVs - High up-front costs of EVs

Sector	Systems map	Prioritised challenge/barrier
		• Lack of EV charging infrastructure
Buildings	Switch to low carbon heating	• Private value for money • High up-front costs • Poor payback periods • Lack of/split incentives • Reactive rather than proactive investments • Reputation and information
	Energy demand reduction	• High age of building owners • Lack of (or split) incentives • High up-front costs • Private value for money • Poor payback periods • Lack of awareness of possible energy savings
Industry	Willingness	• Perceived impact on product quality • Long payback periods • Policy and value-for-money uncertainty • Private cost effectiveness ○ Insufficient incentives ○ Costly period of downtime
	Feasibility	• Internal funding challenges • Lack of internal skills and awareness • Actual risk of impact on product quality • Lack/low technological readiness of alternative technologies
	Regulation	• Regulated processes • Regulatory barriers to fuel switching

The systems maps presented a visualisation of the dominant dynamics affecting the investment environment. These maps included barriers towards decarbonisation and an initial small list of measures that had been identified to address them. In some cases, risks that could potentially hinder efforts, and benefits that may have encouraged decarbonisation irrespective of measures were also included. The systems maps are included in Figure 4-2 to Figure 4-9, below.

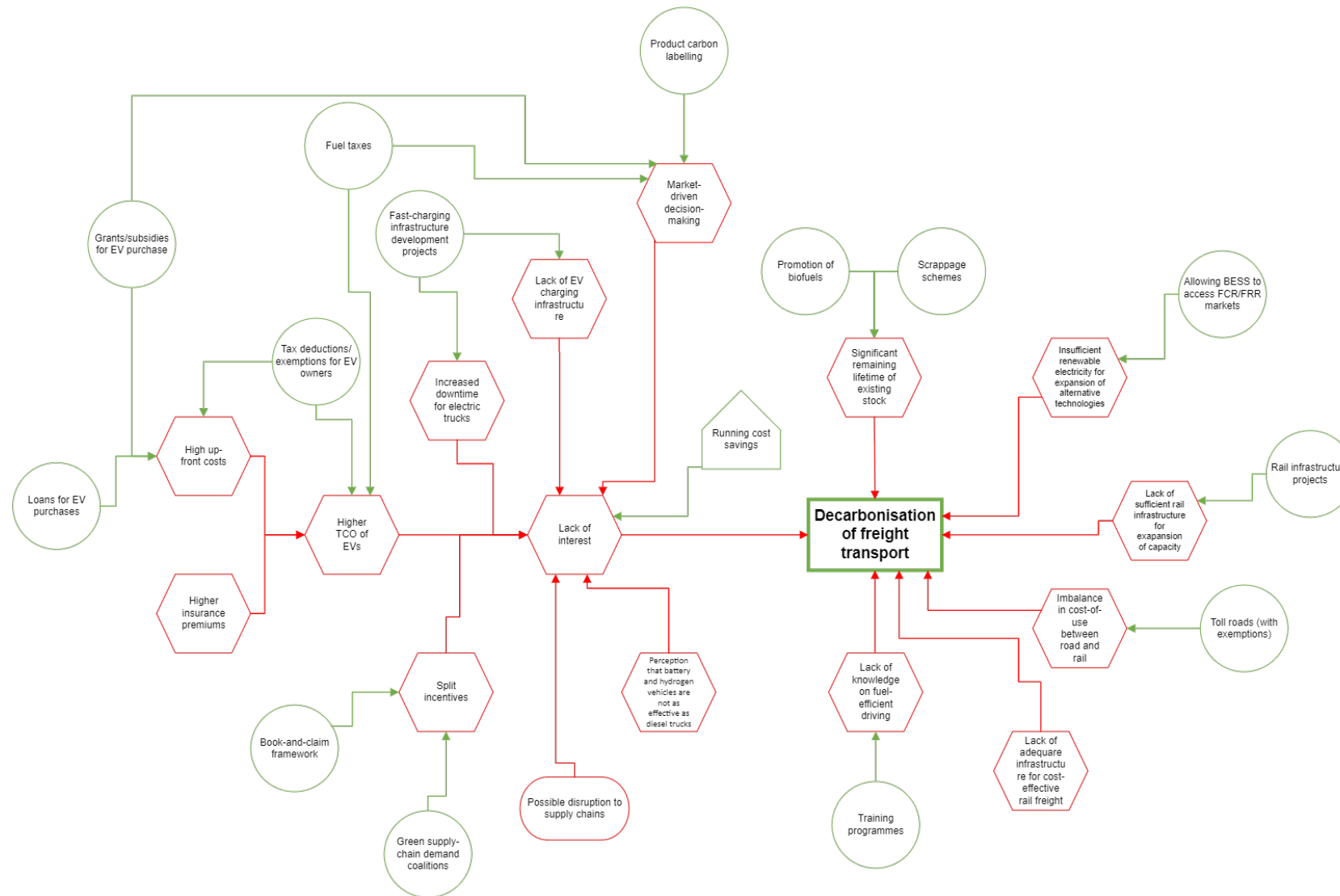
In the figures, nodes are connected by arrows indicating direction of influence, colour coded according to positive or negative impact on the outcome, with all nodes eventually leading to the central node. A central theme relating to decarbonisation of the sector sits at the centre, this may be a particular goal (such as modal shift of transport) or a theme relating to the type of barriers (such as willingness to decarbonise industry). This is surrounded first by barriers/challenges to decarbonisation of the sector directly relating to the central theme. Where a barrier contributes toward another, broader barrier, it feeds into that barrier rather than directly into the central node. Identified measures are then added to the periphery, feeding into all different barriers they address. Finally, where relevant, risk and benefits were added. Where possible, similar barriers are placed in proximity (e.g. grouping all measures relating to Electric Vehicles in the transport sector). A key for the diagrams is shown in Figure 4-1 below.

Figure 4-1 Key for systems map diagrams



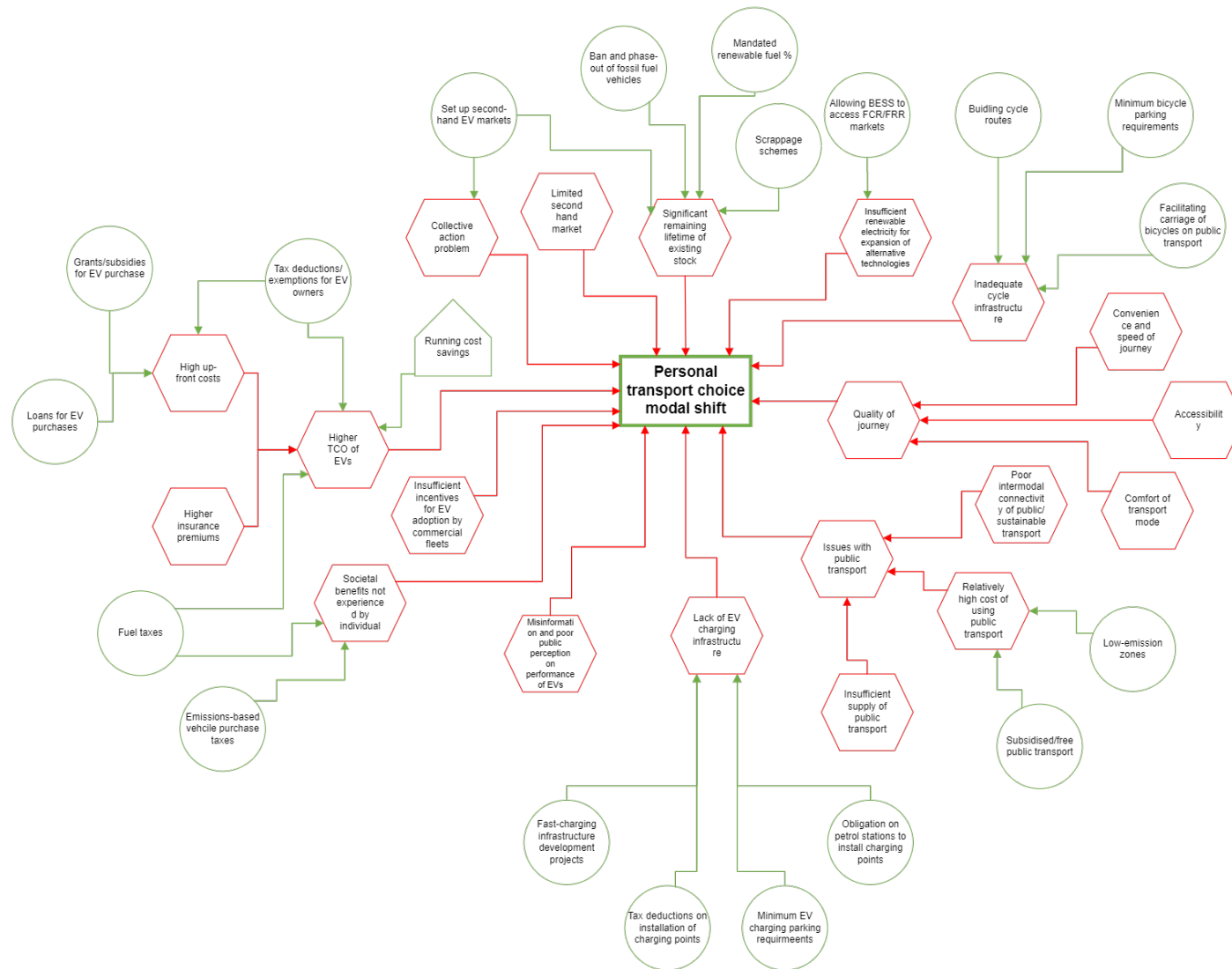
The systems map for freight transport in the transport sector is presented below. The systems map shows the full map of barriers and challenges identified and associated measures identified in the internal workshops.

Figure 4-2 Barriers systems map - Freight transport



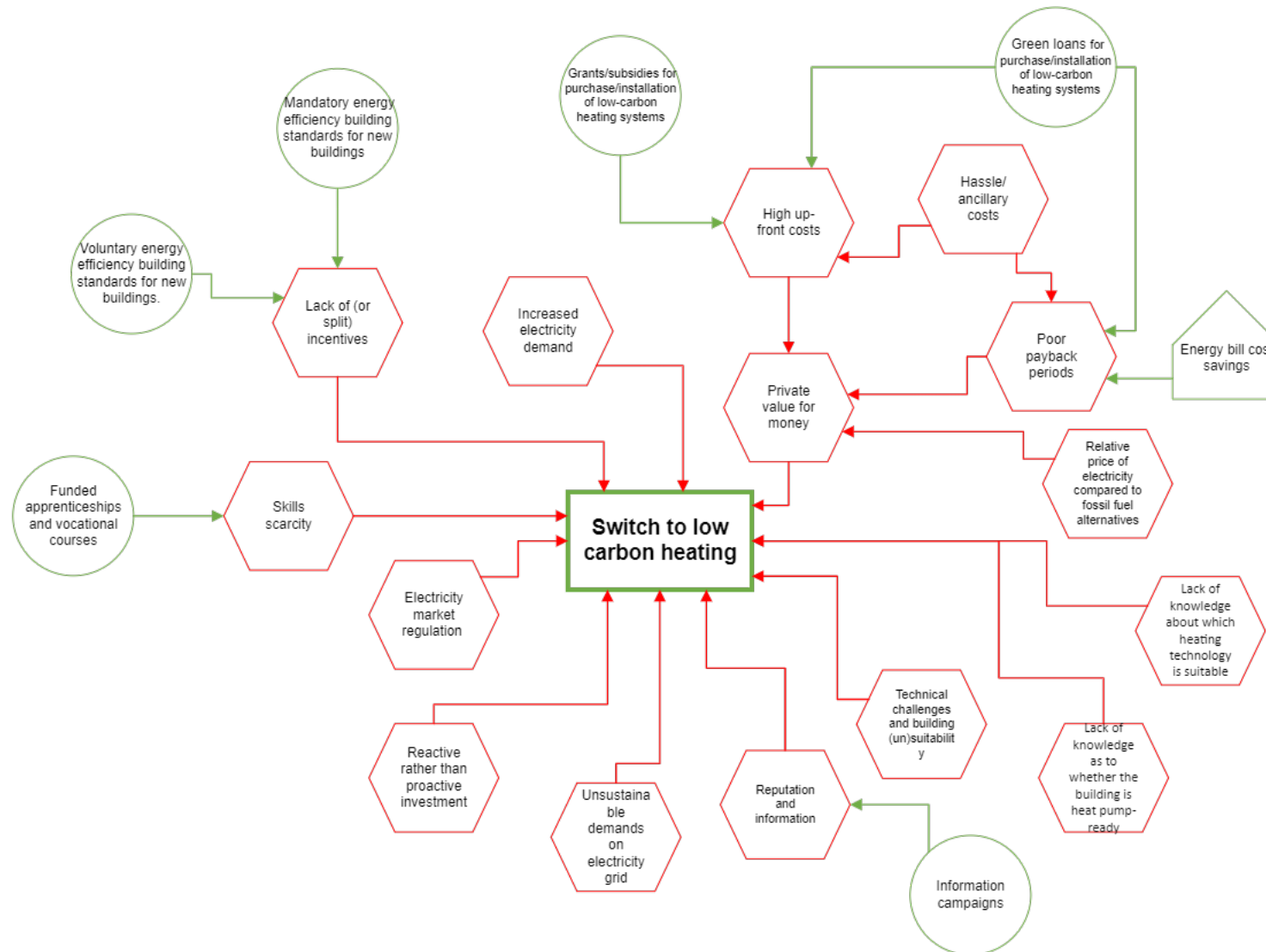
The systems map for personal/modal transport shift in the transport sector is presented below. The systems map shows the full map of barriers and challenges, and associated measures identified by sector experts in the internal workshops.

Figure 4-3 Barrier's systems map - Personal transport/Modal shift



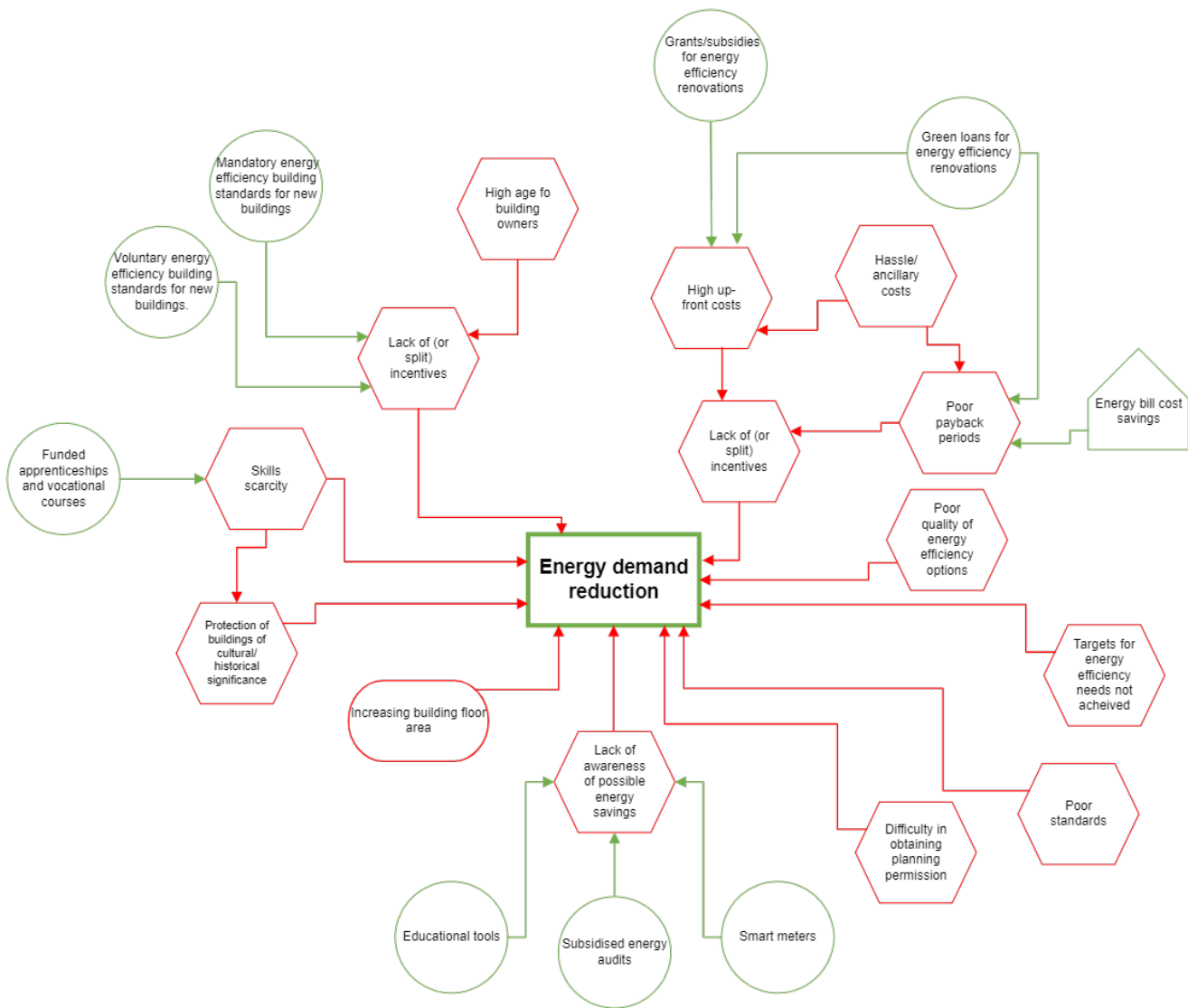
The systems map for low carbon heating in the building sector is presented below. The systems map shows the full map of barriers and challenges, and associated measures identified by sector experts in the internal workshops.

Figure 4-4 Focussed barriers systems map - Low carbon heating (Heat pumps for buildings)



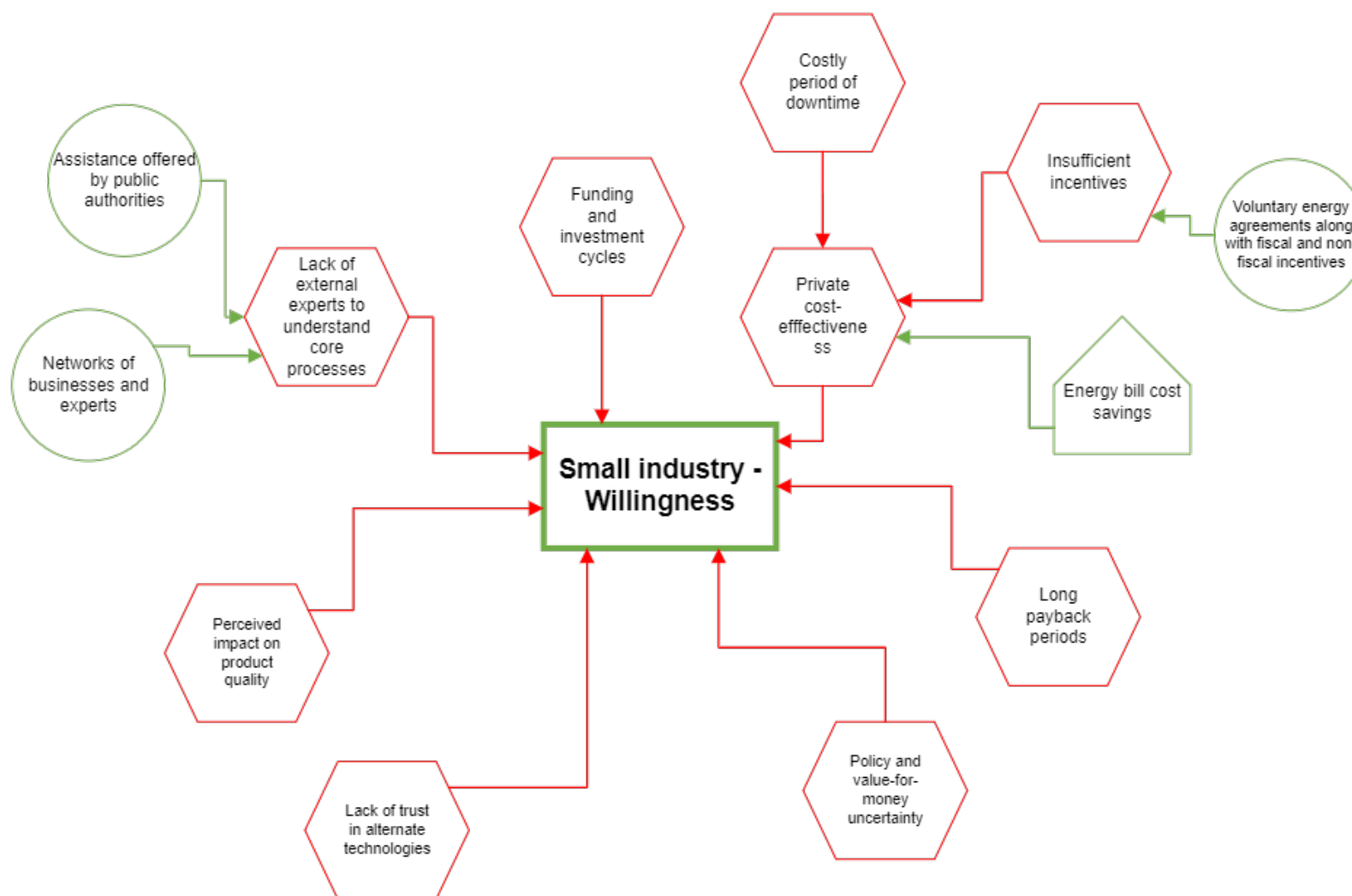
The systems map for Energy demand in the building sector is presented below. The systems map shows the full map of barriers and challenges, and associated measures identified by sector experts in the internal workshops.

Figure 4-5 Focussed barriers systems map – Energy demand for buildings



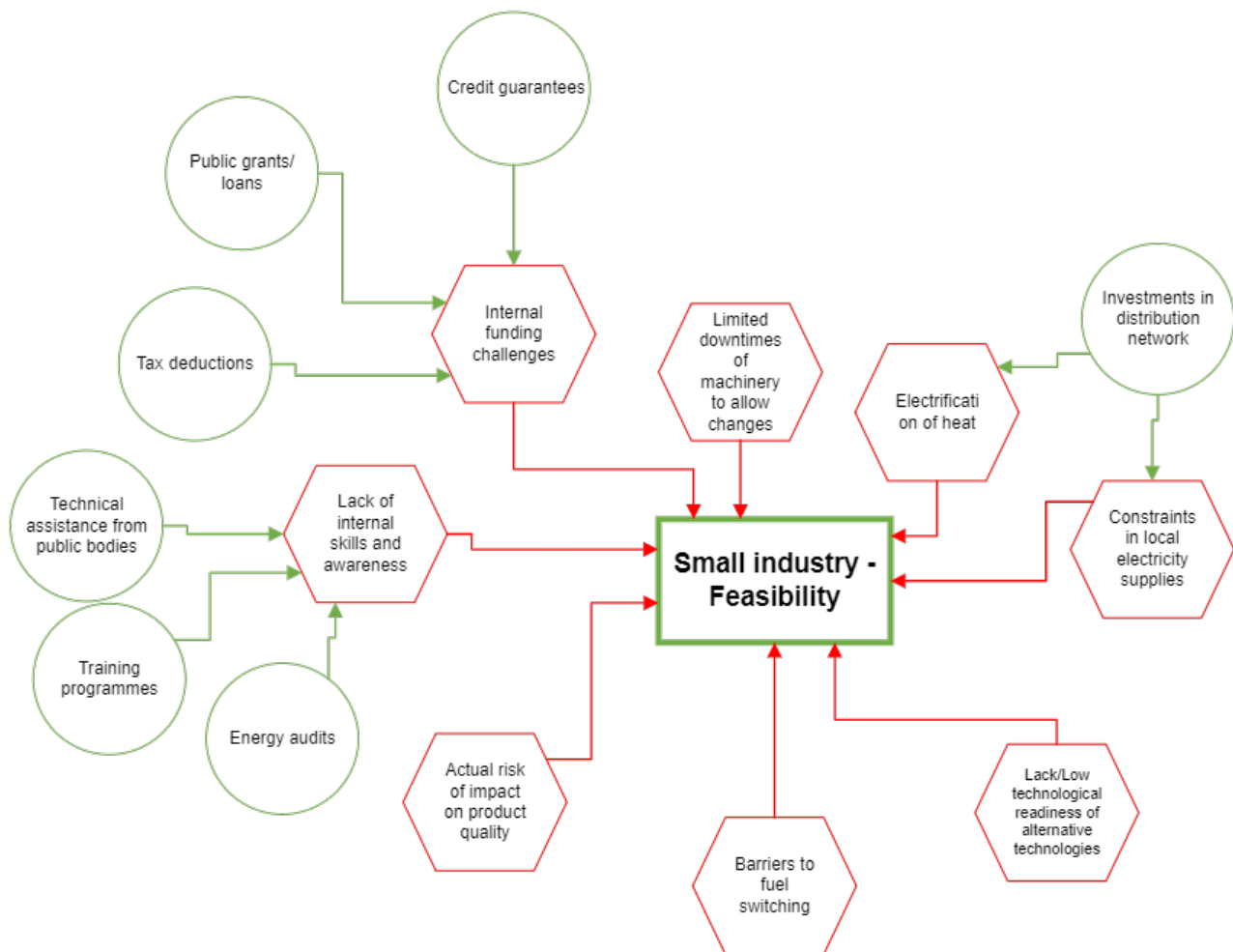
The systems map for Willingness in the Industry sector is presented below. The systems map shows the full map of barriers and challenges, and associated measures identified by sector experts in the internal workshops.

Figure 4-6 Focussed barriers systems map – Industry (willingness)



The systems map for Feasibility in the Industry sector is presented below. The systems map shows the full map of barriers and challenges, and associated measures identified by sector experts in the internal workshops.

Figure 4-7 Focussed barriers systems map - Industry (Feasibility)



The systems map for the Regulation in industry is included below. Only one map is included for this thematic area as there were only two barriers to include, both of which were identified as key barriers in the internal workshops.

Figure 4-8 Focussed barriers systems map - Industry (Regulation)



4.2 IDENTIFICATION OF SUPPORTING MEASURES

During Step 2 of the process key supporting measures across EU27 that can be implemented in the short term and have an impact in decarbonising EU ETS2 sectors (with a 2030 horizon) were identified and classified. The data collection to identify the measures was directly linked with the barriers/ challenges to decarbonisation in the sectors, identified in Step 1. To identify supporting measures, desk-based sources which cover multiple

EU MSs, and provide best practice measures or examples to address identified barriers were systematically reviewed. The main source for the identification of supporting measures in the initial phase was the Odyssee-Mure database. The platform is coordinated by ADEME with technical support from Enerdata and Fraunhofer, and is supported by the LIFE-CET programme of the European Commission. The database is regularly updated by national teams once or twice a year.

To test and validate the identified measures from the desk research, add any novel measures implemented by Member States that have potential to be implemented effectively across the EU, and fill any existing data gaps, the project team held **9 interviews** with selected industry experts and associations.

Figure 4-9 Interview list with selected experts under step 2

Organisation	Area of Expertise
T&E	Transport, freight, electric vehicles, new types of mobility
Union Internationale des Transports Publics (UITP)	Public Transport
BEUC	Consumer perspective on measures to decrease carbon emissions in transport
ICCT	CO ₂ mitigation in road transport (personal/freight transport)
European Heating Industry (EHI)	Heat Pumps
Eurima (European Insulation Manufacturers Association)	Insulation
Euroheat & Power (EHP)	District heating and cooling energy
EURelectric	Electricity Industry
Carbon Market Watch	Carbon Markets

The long list of measures identified as part of Step 2 can be found in Annex 2.

4.3 ADDITIONAL DETAILS ON THE MEASURES INCLUDED IN THE LONG LIST.

The aim of step 3 was to collect additional details on the measures collected in Step 2, drawing from an expanded list of sources. The information collected was later used in Step 4 to compare the measures across a range of criteria and consequently refine the list of measures through a ranking process to a final list of 21. The information collected included: affected stakeholders, expected impacts and details affecting implementation and delivery. The list of measures was also sent to the respective Member States that they were associated with, to provide their views on the measures and provide any additional information from up-to-date sources.

4.4 ASSESSMENT OF THE PRIORITISED MEASURES

4.4.1 Ranking of the long list of measures

The 21 best practice measures were selected by ranking the long list of measures through a 2-tier approach as well as a stakeholder webinar on the 6th of May 2025. In the first round, measures that were mandated by the EU legislation and have no additional element to them from a national perspective were removed, as well as those with insufficient information to qualify them clearly as best practices. In the second round, the measures were ranked according to the criteria in Table 1-1, which left 5 prioritised best practices and 5 reserve measures for each sector.

4.4.2 Key stakeholder webinars

The top 10 measures for each sector were taken forward and presented in 3 webinars on the 6th of May 2025 (one for each sector). Member State representatives, departments from the European Commission and key European stakeholders were invited to share their views on the ranked measures. Based on the results of the webinars, a total of 10 measures were cut across all three ETS2 sectors, resulting in the final list of 20 measures to be developed into case studies. One additional measure was subsequently added after the webinar, bringing the total to 21 measures. Details on each of the webinars are shared here:

4.4.2.1 Road transport

Attendees:

- **78** participants (incl. 20 COM, EEA, consultants).
- **11 stakeholders** as panellists (CLECAT, Carbon Market Watch, Eurelectric, UITP, T&E, E-Mobility Europe, Charge Up Europe, POLIS, ICCT, LeaseEurope, BEUC) and experts from **18 Member States**.

Key outcomes:

- Many alluded to the importance of the CO2 standards for vehicles as a key driver to uptake EVs.
- Bonus malus and tax incentives for new vehicles are considered effective measures.
- Price transparency for public charging should also encompass clarity on the functioning of charge points, and easy payment structures.
- Tolling reform is a welcomed measure and helps to reduce the relative cost of EVs compared to ICE vehicles.
- Financial and fiscal incentives are good for alleviating the up-front cost of EVs. Financial support must come before other measures, e.g. quotas.
- Financial incentives should also support charging infrastructure.
- Streamlining and harmonising administrative processes for grid connections was noted as a clear best practice. This should also encompass improvement of permitting procedures.
- Tax deductibility as a measure does not help low-income families.
- Car centric model should be complemented with a multi modal approach. This includes more public transport, alternative solutions for car sharing, carpooling and so on. Low-income households can benefit from sufficient alternatives to combustion cars.
- The lack of second-hand market for EVs is creating problems for the good functioning of the leasing market for EVs.
- ZEV quotas for company fleet renewals – This measure could be a measure for the future. For the moment reducing the cost of EVs and grid infrastructure improvements are more important.

4.4.2.2 Buildings

Attendees:

- **76** participants (incl. 22 COM, EEA, consultants).
- **9 stakeholders** as panellists (Coalition for Energy Savings (also representing BPIE), Eurima, Carbon Market Watch, EFIEES, Eurelectric, EHI, Efficient Buildings Europe, BEUC, Euroheat and Power) and experts from **17 Member States**.

Key outcomes:

- Reducing electricity prices relative to gas prices – Electricity price depends on multiple factors: production, network costs, taxation and other factors. Careful consideration is required to consider how direct support is administered on electricity bills or reallocation of costs.
- Reducing information gaps (particularly around heat pumps) is needed, as well as support to energy efficiency upgrades. Increasing information/One Stop Shops were strongly supported measures.

- It is important to focus on measures that address vulnerable groups and overcoming split incentives. Tenant vs Landlord. The Carbon Dioxide Cost Sharing act would be a good future measure. This can be done both with SCF and use of ETS revenues more broadly.
- Tax reductions for EE renovations are good and should be focussed for middle income households. While subsidies are better for low-income households.
- Tax reductions have less bureaucracy issues than subsidies. **There needs to be caution that the benefits do not go to the installer of heat pumps (such that they push up their prices to cover the gains of the tax break).**
- **Interest free loans** are a very good measure.
 - Zero-interest loans are difficult to implement in condominiums, given split incentives. Condominiums themselves are not legal entities so they cannot access loans. They are also often made up of low-income households – but don't count as one.
- Minimum Energy Performance Standards for worst performing buildings in the rental sector could be considered. It addresses split incentives.
- Subsidies for building renovations need to be staged deep renovation, and there needs to be a good ratio between costs and CO2 savings.
- In general, for drafting of all case study measures, **a preferred target group should be added** as an element of guidance on measures/scheme. E.g. tax breaks for higher income household's vs subsidies for low-income households.
- Financial measures should be designed in such a way that there is sufficient stability in the incentive schemes (whether it be subsidies, tax reductions or others) and that they remain in place for a long period.

4.4.2.3 Industry

Attendees

- **37** participants (incl. 12 COM, EEA and consultants).
- **3 stakeholders** as panellists (FoodDrinks EU, Eurelectric, Cepi) and experts from **13 MS**.

Key outcomes:

- Direct funding measures such as grants and subsidies for demonstration projects are good, although scalability will ultimately depend on national budget constraints.
- Language is still a relevant barrier, so support activities should be implemented at the national level – particularly with regards to training, awareness raising and audits.
- Energy Saving Loans and Green Loans: overall good measure, if measure stability is granted. Measures should be stable and last for a number of years in order to be effective.
- Measures around smart meters/digitalisation and promoting the role of flexible energy consumption and consuming outside of peak hours.
- The main challenge for industry is to have awareness for available schemes and resources to submit for funding.
- Capacity and technical expertise are needed to support SMEs with the decarbonisation process. Industry associations and SME associations can play a supporting role.
- There are many existing networks for small companies where they can get support for greening. We should build on those rather than increase the number of networks. SMEs need one-stop shops. One example at European level is the Enterprise Europe Network.
- Energy efficiency networks can be successful, but information must be sector specific and constant to maintain interest.
- Financial support should preferably come through multiple routes (subsidies, loans, grants etc).

4.5 CASE STUDY DEVELOPMENT

An expanded description of Step 5: Case study development, is included under Section 2 of the report, which provides an expansion of the case studies which have been developed into best practice. Member States can take inspiration from these, to implement similar measures themselves to promote effective long-term decarbonisation in the ETS2 sectors, with short-term initial impact (3-5 years). The shortlist of 21 developed case studies is included in Table 2-1.

5. ANNEX 2 – LONG LIST OF MEASURES

Annex 2 provides details of the long list of measures collected during Step 2 of the assessment, with their corresponding prioritised barriers. A summary of the measures is provided in Table 5-1 below followed by tables for each of the measures with further details.

It should be noted that the 21 best practice measures do not perfectly match the long list of measures that were assessed in early stages of the work. Some of the measures have been combined and in other cases renamed or partially rescope based on consultation with the Member States and experts who participated in the Webinar on 6th May 2025.

Table 5-1 Summary of long list of measures

No.	Challenge	Name of the supporting measure	Geographical scope	Category/type of measure
Freight Transport				
1	ZEV up-front cost	Focussed subsidies for purchase and leasing of ZE HDVs	NL	Financing grants/subsidies -
2		Financial instruments aside from purchase subsidies - Ireland tax break and amortisation	IE	Financing - Soft loans/loans
3		Financial instruments aside from purchase subsidies – ECO fund Slovenia	SL	Financing - Soft loans/loans
4	Concerns over charging infrastructure and grid connection (including costs)	Financial incentives for grid connection of charging infrastructure (national / regional) - Germany	DE	Financing grants/subsidies -
5		Financial incentives for grid connection of charging infrastructure (national / regional) - France	FR	Financing grants/subsidies -
6		Financial incentives for grid connection of charging infrastructure (national / regional) - Ireland	IE	Financing grants/subsidies -
7		Financial incentives for grid connection of charging infrastructure	ES	Financing grants/subsidies -

No.	Challenge	Name of the supporting measure	Geographical scope	Category/type of measure
		(national / regional) - Spain		
8		Credits for private charging infrastructure	DE	Financing – credit mechanism
9		Anticipatory investments	FR, DE, LT	Regulation standards &
10		Streamlining and harmonising administrative processes for grid connections	NL, UK	Regulation standards &
11	High comparative operating cost of ZEV options	Eurovignette – Truck tolling in favour of ZE HDVs.	DE	Financing – tolling mechanism
12		Tax incentives for ownership of EVs	DE, IT, LV	Financing - Tax incentives
Personal transport/modal shift				
13	High up-front costs of ZEVs	Social leasing	FR	Financing grants/subsidies -
14		Subsidies based on social criteria, including scrappage schemes	PL	Financing grants/subsidies -
15		Emission based taxes and tolls (bonus-malus). Tax advantaged for ZEV and malus for ICEV	FR, NL, AT, DEN, SE, BE, NO	Financing - Tax incentives
16		Reduced and simplified ticket pricing for public transport	NL, AT	Regulation standards &
17	Lack of incentives for modal shift away from cars	Urban transport planning towards modal shift - Superblock model	AT, DE, ES	Regulation standards &
18		On-demand transport	BE, DE, ES, NL	Regulation standards &
19	Support for commercial entities to adopt EVs for their fleets	Tax deductibility for ZEVs	BE	Financing - Tax incentives
20		Taxation of private use of company cars	BE, AT	Financing - Tax incentives
21		ZEV quotas on company fleets renewals	FR	Regulation standards &
22	Access to affordable public charging infrastructure	Minimum e-mobility infrastructure requirements at buildings, parking spaces	DE, BE, FR	Regulation standards &
23		Non-discriminatory access to public charging infrastructure	EU	Regulation standards &

No.	Challenge	Name of the supporting measure	Geographical scope	Category/type of measure
24		Fair allocations of public land for charging infrastructure and prevention of monopoly formation	DE	Regulation & standards
25		Price transparency for public charging	EU, DE	Regulation & standards
Renewable-Based & Renewable-Ready heating technologies				
26	Skills scarcity	Upgrading Training Assistance Act (Aufstiegs-BAföG)	DE	Financing - grants/subsidies
27		Image campaign to attract young talent to the skilled trades	DE	Awareness, technical support and training
28	Lack of incentives (Split incentives)	Mandatory energy and carbon requirements for new and existing buildings	DE, FR	Regulation & standards
29		Energy poverty mediation	Lille - FR	Financing - grants/subsidies
30	Private value for money (high up-front costs)	Subsidies for building renovation	EE, AT, FR, DE, SI	Financing - grants/subsidies, Financing - Soft loans/loans
31		Tax deductions for renewable heating systems	DE, LT, BG, AT, BE, CZ, EE, FR, EL, IE, IT, LV, LU, PL, PT, CY, RO, SI	Financing - Tax incentives
32	Private value for money (long payback periods)	Subsidies for building renovation	EE, AT, FR, DE, SI	Financing - grants/subsidies, Financing - Soft loans/loans
33		Reducing electricity prices	DE, BE, GR, IE, LU, CR, MT, ES	Regulation & standards, Financing - Tax incentives
34	Reputation information and	Energy Audits (Advice) for Households (Austria)	AT	Awareness, technical support and training
35		Information about heat pumps	FI, NL	Awareness, technical support and training, Financial scheme
Energy Demand				
36	Private value for money (Long payback periods)	Brussels - Interest-Free Loans for Energy Efficiency Investments [ECORENO]	Brussels - BE	Financing - Soft loans/loans

No.	Challenge	Name of the supporting measure	Geographical scope	Category/type of measure
37		On-bill-financing	FR, IT, NL	Financing - Soft loans/loans
38	Private value for money (High up-front costs)	Subsidies for building renovation	EE, AT, FR, DE, SI	Financing - grants/subsidies, Financing - Soft loans/loans
39		Tax deductions for energy efficiency renovations	CY, PL, NL, IE, FI, LU	Financing - Tax incentives
40	Lack of incentives (split incentives)	Energy-Linked Rental Price Regulation	NL, DE, BE	Regulation & standards
41		Minimum energy performance requirements for new and existing buildings	CY, SI	Regulation & standards
42	Lack of awareness of possible energy savings	Energy Audits (Advice) for Households (Austria)	AT	Awareness, technical support and training
43		Energy efficiency web tool	BE, ES, NL	Awareness, technical support and training
44	High age of building owners	Energy efficiency information programmes	LV, CZ, SI, FR	Awareness, technical support and training
45		State guaranteed loans for energy efficiency measures	SI	Financing - Soft loans/loans
Small Industry - Willingness				
46	Insufficient incentives and costly period of downtime	Voluntary Energy Efficiency Agreements	DE, FI	Voluntary agreements, Financing - grants/subsidies
47		Business Pool	DK	Financing - grants/subsidies
48		Energy Saving Loan and the Green Loan	FR	Financing - grants/subsidies
49	Perceived risk of impact on product quality	Energy efficiency networks for the industry	SE	Awareness, technical support and training, Financing - grants/subsidies
50		Innovation Fund	EU	Financing - grants/subsidies
51	Policy and value-for-money uncertainty	Green Deal Industrial Plan and Net-Zero Industry Act	EU	Regulation & standards
52		Fiscal incentive to fuel switching	DE	Financing - grants/subsidies
53	Long payback periods	Business Pool	DK	Financing - grants/subsidies

No.	Challenge	Name of the supporting measure	Geographical scope	Category/type of measure
54		Capital investment for decarbonisation processes	IE	Financing - grants/subsidies
Feasibility				
55	Lack of internal skills and awareness	Provision of external support	AT, CY, FI, IE, SE	Awareness, technical support and training
56		Energy audits	AT, FI, IE	Awareness, technical support and training
57		Support Programme for the Energy Transition of the Industry (PACTE Industrie)	FR	Awareness, technical support and training, Financing - grants/subsidies
58		Feasibility studies of energy performance or decarbonisation of industrial companies	FR	Awareness, technical support and training, Financing - grants/subsidies
59	Internal challenges funding	Subsidy schemes	AT, FI, DE, IT, LV, HU, NL, PL, ES	Financing - grants/subsidies, Financing - Tax incentives, Financing - Soft loans/loans
60		DECARB IND 25 and DECARB IND+	FR	Financing - grants/subsidies, Financing - Soft loans/loans
61		Energy Savings Certificates	FR, ES	Regulation & standards
62	Lack of technical readiness of alternative technologies	Innovation Fund	EU	Financing - grants/subsidies
63		National Investment Funds supporting R&I	FR, DE, IE, NL	Financing - grants/subsidies
64	Regulated Processes	Sustainable Industry Infrastructure Program (PIDI) & Multi-Year Program Infrastructure Energy and Climate (MIEK)	NL	Regulation & standards
65		Regulatory sandboxes for low-carbon innovation	NL	Regulation & standards
66	Costs due to regulation compliance for fuel switching	Fiscal incentives to fuel switching	DE	Financing - grants/subsidies
67		Heat Fund	FR	Financing - grants/subsidies, Awareness, technical support and training

No.	Challenge	Name of the supporting measure	Geographical scope	Category/type of measure
68		Infrastructure development for alternative fuel	HR	Financing grants/subsidies -

6. ANNEX 3 – SUMMARY TABLES FOR MEASURES IN THE LONG LIST

6.1 TRANSPORT - FREIGHT TRANSPORT

This subsection contains the expanded measures from the long list of measures, in table format for freight transport.

Table 6-1 Focussed subsidies for purchase and leasing of ZE HDVs - AanZET

Name of the supporting measure:	Focussed subsidies for purchase and leasing of ZE HDVs - AanZET
Short description	The Purchase Subsidy Scheme for Zero-Emission Trucks (AanZET) is specific for entrepreneurs and non-profit organizations that want to buy or financially lease a new, completely emission-free (emission-free) truck. The programme is currently open and has followed on from the SEBA (previously implemented scheme). The subsidy amount depends on vehicle category and type of company and provides a maximum of € 115,200. Important changes for AanZET 2025 compared to AanZET 2024: • The concept of emission-free (emission-free) truck has been amended. As a result, vehicles with a hydrogen combustion engine (H2ICE) are also eligible for subsidy. • Trucks weighing 4,250 to 10,000 kilograms are no longer eligible for subsidy. Emission-free trucks in this weight class are already comparable in price to diesel trucks in this weight class. Subsidy based on cost differentials is therefore no longer possible. • The maximum amounts for N2 vehicles (from 10,000 kg to 12,000 kg) have been increased. • The subsidy percentages and maximum amounts for N3 vehicles up to and including 18,000 kg have been brought to the same level as the other N3 vehicles.
Geographical scope	NL
Category/type of measure	Financing - grants/subsidies
Rationale	While the scheme acts a subsidy scheme, it reflects cost differential between a ZE HDV and the diesel equivalent of the same vehicle. The subsidy is proportional to the size of the business applying. Noting that smaller businesses are less likely to have the capital available.
Source	Purchase subsidy for zero-emission trucks (AanZET) RVO.nl Purchase subsidy for zero emission trucks Business.gov.nl
Affected Stakeholder(s)	Operational lease companies for trucks, SMEs, NGO

Name of the supporting measure:	Focused subsidies for purchase and leasing of ZE HDVs - AanZET
Expected impacts	Effectiveness: positive interaction with the planned truck levy (by 2026). Benefits: The measure supports freight transport owners, whether that be SMEs or lease operators. Cost (social and public): The total budget for the scheme was EUR 35.3 million. The scheme will re-open in 09/2025 with a new EUR 30 million budget. Context: It was introduced within the broader Dutch and EU climate policies aimed at reducing emissions in the transport sector. Zero-Emission City Logistics (ZES Zones) – 2025. From 2025, many Dutch cities will enforce zero-emission zones for freight transport. AanZET supports businesses in transitioning their fleets before these restrictions take effect. Scalability: The limitations to this subsidy scheme lie with the vehicle types. The subsidy is only available for vehicles where there is a notable disparity between an EV and its emitting alternative on the market. Speed of implementation: For being a subsidy the timeframe is very short, the application window in the Netherlands was 28/01 - 07/02. Replicability: This measure is highly replicable in other MS and the element of having subsidies where there is a pricing disparity between EVs, and emitting vehicles means the subsidy can be phased out over time if it is effective but unaffordable to maintain.
Details affecting delivery	Expanding on the truck levy that will be introduced. In mid-2026, the Netherlands will introduce a truck toll. Truck owners will pay an amount per kilometre driven on the motorways, several N-roads and some municipal roads. At the same time, the Eurovignette will be abolished (i.e., the existing user charge, not the implementation of the Eurovignette Directive), and the motor vehicle tax will be reduced to a minimum. The toll applies to all domestic and foreign trucks weighing more than 3.5 tonnes. The average rate per kilometre is 16.7 cents (price level 2023). The lower the emissions and the lighter the truck, the lower the kilometre rate. The net proceeds of the levy will go to subsidies such as those for the purchase of electric or hydrogen trucks and charging stations – which will render the AanZET as a more sustainable subsidy in the near term.
Source (impacts)	Truck Charge Program Vrachtwagenheffing.nl

Table 6-2 Financial instruments aside from purchase subsidies - Ireland tax break and amortisation

Name of the supporting measure:	Financial instruments aside from purchase subsidies - Ireland tax break and amortisation
Short description	Since 2008 Ireland has had the accelerated capital allowance in place for energy efficiency measures. However, this also applied to the purchase of electric vehicles. The Accelerated Capital Allowance (ACA) is a tax incentive scheme that promotes investment in energy efficient products and equipment. The ACA is based on the long-standing 'Wear and Tear Allowance' for investment in capital plant and machinery, whereby capital depreciation can be compensated through a reduction in an organisation's tax liability. The ACA allows companies that pay corporation tax or income tax on trading or professional income in Ireland to deduct the full cost of the equipment from their profits in the year of purchase. As a result, the business's taxable profits are reduced by the value of qualifying capital expenditure. By contrast, the Wear and Tear Allowance provides for the same tax reduction, but this is spread evenly over an eight-year period. For freight vehicles coming under the

Name of the supporting measure:	Financial instruments aside from purchase subsidies - Ireland tax break and amortisation
	category "Electric and Alternative Fuel Vehicles" the accelerated allowance is based on the lower of the actual cost of the vehicle or €24,000.
Geographical scope	IE
Category/type of measure	Financing - Soft loans/loans
Rationale	Companies can deduct the cost up to Euros 24,000s on BEVs from their taxable income to receive a tax break.
Source	Eligibility For Accelerated Capital Allowances with Electric Vehicles
Affected Stakeholder	Companies, unincorporated businesses, sole traders, and farmers for electric and alternative fuel vehicles
Expected impacts	Effectiveness: For businesses considering the switch to electric, the benefits are substantial: • A 74% reduction in fleet costs compared to new diesel engine cars. • Lower motor tax rates (as low as €120). • Reduced maintenance costs. • A positive impact on the environment. Benefits: the ACA initiative which falls under the Climate Action Plan by Zero Emission Vehicles Ireland, supports the goal of having 945,000 EV's in Ireland by 2030. Cost (social and public): Businesses do not pay a fee to participate in the ACA scheme. It is not clear what the public cost is. Context: Ireland has freed up funding for its Climate Action Plan by Zero Emission Vehicles Ireland, supports the goal of having 945,000 EV's in Ireland by 2030. Scalability: ACA can be claimed by companies, unincorporated businesses, sole traders, and farmers for electric and alternative fuel vehicles Speed of implementation: This measure can be implemented very quickly in the short term. Replicability: Tax incentives are already introduced in a number of European countries, so the measure is replicable.
Details affecting delivery	Eligibility criteria is included here: Enhanced Capital Allowances
Source (impacts)	Frontline Energy SEAI Accelerated Capital Allowance: Frontline Energy can help reduce your tax liabilities and drive your business towards a sustainable future An Overview of Ireland's Electric Vehicle Incentives and a Comparison with International Peers – Publication 12 of 2022

Table 6-3 Financial instruments aside from purchase subsidies – ECO fund Slovenia

Name of the supporting measure:	Financial instruments aside from purchase subsidies – ECO fund Slovenia
Short description	The ECO-fund offers long-term loans for the purchase second-hand and new electric vehicles in Slovenia. Established in 1993. Its main purpose is to promote development in the field of environmental protection by offering financial incentives such as soft loans and grants for various environmental investment projects.

Name of the supporting measure:	Financial instruments aside from purchase subsidies – ECO fund Slovenia
	For new and used electric vehicles: The amount of each loan is limited to the minimum amount of credit, which is EUR 25,000 , and the maximum amount of credit, which is EUR 2 million . The total indebtedness of the borrower with the Eco Fund must not exceed EUR 10 million . The loan is granted as a proportion (in percentage) of the value of the eligible investment costs. The maximum credit ratio is 85% of recognised investment costs . The repayment period may not exceed 5 (five) years . A moratorium on the repayment of principal cannot be obtained. The loan is repaid in monthly instalments, with an annual interest rate: f3.5% .
Geographical scope	SI
Category/type of measure	Financing - Soft loans/loans
Rationale	The most significant aspect of Eco Fund's operating environment is the requirement that Eco Fund maintains the real value of its assets. For this reason, Eco Fund has provided support to environmental investments through soft loans and developed a strong focus on the financial sustainability of the projects it supports. This makes support of Up-front costs more sustainable.
Source	Buying New Electric Vehicles: Credit Eco Fund Buying Used Electric Vehicles for Road Transport: Credit Eco Fund English Eco Fund
Affected Stakeholders	Companies
Expected impacts	Effectiveness: Eco Fund's subsidies have had a positive effect on tax revenues, diminishing of grey economy, new green jobs, sustainable development of the construction planning and business, as well as on the development of the use of strategic resources such as wood. The range of funding measures available cover multiple entities as well as vehicle ownership and funding for charging infrastructure. Benefits: - Cost (social and public): - Context: Slovenia has had the Eco Fund in place since 1993. The fund owes its longevity to offering financially sustainable options. Its success has meant that loans as financing options are readily available. Scalability: The ECO Fund is available for companies and individuals with varying grants and loans. Offering sustainable finance options should be obtainable for most stakeholders, however a payback period of only 5 years may limit the accessibility of the option due to budget constraints. Speed of implementation: The measure is easily implementable, with a payback period of 5 years (short term). Replicability: The Slovenian Eco fund is financing loans in a partnership with EBID and grants available through the climate change fund because of the sale of ETS allowances. The opportunity for all MS to allocate funding from the EU ETS revenues into transport expenditure should be possible.
Details affecting delivery	None
Source (impacts)	letno-porocilo-eko-sklada-za-leto-2023 English Eko sklad

Table 6-4 Financial incentives for grid connection of charging infrastructure (national / regional) – Germany

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - Germany
Private charging	
Short description	The German Government aims to accelerate the decarbonisation of the transport sector. The Plan includes measures to increase the electrification of heavy-duty road freight transport specifically, through the development of a truck fast-charging network. Approximately 350 fast-charging sites will be built - with tender procedures for the first 130 launched in 2024. The Plan aims to facilitate the installation and operation of charging points, making charging infrastructure investment more attractive for the private sector. The grid connection is included in the subsidy for charging infrastructure from the German Federal Ministry for Digital and Transport (BMDV). The programme subsidises up to 40 % of the total cost of grid connection and charging points costs and does so up to 30,000 EUR per charging point, depending on the company size. On a regional level, Berlin also offers grid connection subsidies at the low voltage grid of max 5,500 € and at the medium voltage of max. 55,000 € for instance. The grid connection is included in the subsidy for charging infrastructure from the German Federal Ministry for Digital and Transport (BMDV).
Geographical scope	DE
Category/type of measure	Financing - grants/subsidies
Rationale	Reducing the costs of connecting depot charging infrastructure to the grid and the costs of increasing grid connection capacity for transport companies
Source	Germany Builds Nationwide Fast-Charging Network for EVs EV Magazine
Affected Stakeholder	Companies
Expected impacts	Effectiveness: The truck fast-charging network will go some way towards meeting the EU's requirement to provide fast-charging infrastructure for battery-electric trucks every 60 to 100 km along key highways. Large electric trucks are relatively new on the market and can cost more than twice as much as their diesel equivalents. To complement the tolling scheme in Germany they intend to build a network of truck fast-chargers Benefits: As an intermediary goal, Germany wants a third of its heavy road haulage to run on electricity, or on fuels produced using electricity (such as synthetic methane or hydrogen) by 2030. Cost (social and public): EUR 150 million in funding Context: - Scalability: The initiative is highly scalable, given that Germany is looking to free up 1.9 billion Euros of funding to construct 9000 high power charging points by 2026. Speed of implementation: This should be relatively quick to implement, as mentioned above the network of 9000 high powered chargers is expected to be complete by 2026. Replicability: The availability of funding is the main barrier, and also the grid capacity along highways. In terms of development of charging points this should be achievable from an infrastructure point of view across Europe. The rollout of the credit system should incentivise private investment.
Details affecting delivery	None

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - Germany
Source (impacts):	Germany OKs fast-charging infrastructure for trucks Fleet Europe 20241101_Foerderlandschaft_ENG.png (1280×720)

Table 6-5 Financial incentives for grid connection of charging infrastructure (national / regional) - France

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - France
Private charging	
Short description	The ADEME Advenir programme supports the first 1,000 charging stations in depots for municipalities or companies and has a 50 % subsidy rate for the installation of charging stations and including grid connection, which is further differentiated according to performance classes.
Geographical scope	FR
Category/type of measure	Financing - grants/subsidies
Rationale	A law is coming on for France. For existing parking lots owned by companies and public authorities, a gradual obligation has been introduced: by 2025, at least 5% of spaces in parking lots with more than 100 spaces must be equipped with recharging stations. This percentage is intended to increase gradually, to encourage a smooth transition to a widespread and accessible recharging infrastructure. The Advenir programme is intended to provide financial support for this transition.
Source	What grants are available for installing a charging station in 2024? - Driveco The Electric Vehicle Charging Station Financing Program - Advenir
Affected Stakeholder	Companies
Expected impacts	Effectiveness: Most short-haul journeys for freight require depot charging, this allows companies to mobilise capital for investments in charging that is available for HDV charging but also available for the public. This measure will tie in well with the crediting mechanism to ensure companies can have a return on their investment and reduce the payback period. Benefits: This subsidy only applies for 1000 charging points for HDVs; however, it is a starting point. Cost (social and public): This is part of 530 million Euros of mobilised funding for Created in 2016, the Advenir programme, led by Avere-France, supports the installation of electric vehicle charging stations. Thanks to the mechanisms of energy certificates, it complements public initiatives to support electric mobility. Advenir, with the objective to finance 250,000 charging points by 2027 for individuals in multi-family buildings, condominium management companies, companies, local authorities and public entities. Context: - Scalability: The measure is already part of a larger package of funding for charging infrastructure available for: • Businesses • Local authorities • Private individuals living in a collective building

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - France
	• Condominiums or social landlords • Public Entities Speed of implementation: The funding for Advenir is set to run until 2027, so they are expecting to have another 110,000 charge points implemented by then, to meet their target of 250,000. The speed of implementation is relatively short term. Replicability: The availability of funding is the main barrier, and also the grid capacity along highways. In terms of development of charging points this should be achievable from an infrastructure point of view across Europe. The rollout of the credit system should incentivise private investment.
Details affecting delivery	None
Source (impacts):	What grants are available for installing a charging station in 2024? - Driveco The Electric Vehicle Charging Station Financing Program - Advenir

Table 6-6 Financial incentives for grid connection of charging infrastructure (national / regional) - Ireland

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - Ireland
Private charging	
Short description	Zero-Emission Heavy Duty Vehicle – Recharging Infrastructure Grant Scheme (ZEHDV-I). The Scheme is intended to assist the purchase and installation of infrastructure associated with the recharging of Heavy-Duty Vehicles (HDVs) that are electric and zero-emission. The Scheme awards grants to assist companies and enterprises who wish to develop infrastructure to recharge Zero-Emission Heavy Duty Vehicles (ZEHDV). Grant amounts are calculated as a percentage of the eligible costs associated with the development of the recharging infrastructure. Grant levels awarded to applicants depend on: 1. The size of the enterprise or company applying for the grant; and 2. The location of the recharging infrastructure.
Geographical scope	IE
Category/type of measure	Financing - grants/subsidies
Rationale	Grants help SMEs and other companies invest in charging infrastructure, which reduces costs for freight through overnight/depot charging in comparison with public charging.
Source	Zero-Emission Heavy Duty Vehicle – Recharging Infrastructure Grant Scheme More info on size of grants can be found in this document Zero-Emission Heavy Duty Vehicle – Recharging Infrastructure Grant Scheme
Affected Stakeholder	Companies
Expected impacts	Effectiveness: The Scheme is intended to assist the purchase and installation of infrastructure associated with the recharging of Heavy-Duty Vehicles (HDVs) that are electric and zero-emission. The Climate Action Plan has called for 700 HDVs and 300 electric buses by 2025, growing to 3,500 low-emission trucks and 1,500 electric buses by 2030.

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - Ireland
	Benefits: - Cost (social and public): Funded by the Department of Transport. Context: Ireland It is estimated that by end of 2025, at least 8 charging pools, dedicated to infrastructure for HDVs (including buses), will be installed across the TEN-T Network (motorway network). Each motorway charging pool will consist of an aggregate charging capacity of 1400 kW with at least one 350 kW charger. In addition to this, by 2025, a dedicated HDV charging pool of at least 600 kW will be present at each of Dublin, Cork, and Shannon airports. Scalability: in Ireland there is a scheme for HDV and LDVs. It is scalable for freight transport. Speed of implementation: In order to enable the delivery of this infrastructure, ZEV1 will work with private sector providers, as well as TII, ESNB, and local authorities to develop a National EV Charging Network Plan (En-Route Charging) for HGVs. Replicability: Similar schemes are already in place across other MS.
Details affecting delivery	None
Source (impacts):	Zero-Emission Heavy Duty Vehicle – Recharging Infrastructure Grant Scheme Assets.gov.ie

Table 6-7 Financial incentives for grid connection of charging infrastructure (national / regional) - Spain

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - Spain
Private charging	
Short description	The programme MOVES III, that supports electric mobility, includes in its program of incentives II, subsidies for the grid connection. In fact, it provides support for “The installation of electrical elements, including the transformer and the connection work to the distribution network”. For companies and public entities with economic activity, public access charging and P ≥ 50 kW, the percentage of eligible cost covered by aid is: • 20% large enterprise • 40% Medium enterprise • 50% Small enterprise For companies and public entities with economic activity: private access charging or public access with P < 50 kW: • 20% • 30% SME SMEs, which take advantage of a minimis at the time of application, recharge public access and P ≥ 50 kW: • (45% Medium-sized company) • (55% Small Business) These figures increase for entities located in municipalities with less than 5000 inhabitants.
Geographical scope	ES
Category/type of measure	Financing - grants/subsidies

Name of the supporting measure:	Financial incentives for grid connection of charging infrastructure (national / regional) - Spain
Rationale	SMEs in particular will struggle to mobilise funding for charging installations, supports here will help smaller depots uptake EVs. Regional hubs are targeted, as most freight journeys in the EU will cover shorter hub-to-hub trips and this measure will help to support it.
Source	www.idae.es
Affected Stakeholder	SME, Municipalities
Expected impacts	Effectiveness: At the end of 2023, the budget already enabled to regional administrations, which operates the incentives at a regional level, amounted to €971,79 million, with aid requests for 104,048 electric vehicles and 99,700 charging points. Benefits: Specific information on emissions savings is not available. Cost (social and public): The overall programme initially had a budget of 400 million euros, which has subsequently increased to 1.55 billion euros within the framework of the Recovery & Resilience Fund. Context: This funding helps support municipalities based on population as well as national level. Scalability: Eligible stakeholders already include individuals and self-employed persons, communities of owners, legal entities incorporated in Spain, Industrial Estates Conservation Entities or Agricultural Transformation Companies. Speed of implementation: Relatively quick as by the end of 2023, the budget already enabled to regional administrations, which operates the incentives at a regional level, amounted to €971,79 million, with aid requests for 104,048 electric vehicles and 99,700 charging points. Replicability: The replicability will depend on the funding available for MS from the Recovery and Resilience fund to produce something similar. However, all MS are rolling out charging infrastructure.
Details affecting delivery	None
Source (impacts):	MOVES III Programme Idae Spain – EV TCP

Table 6-8 Credits for private charging infrastructure

Name of the supporting measure:	Credits for private charging infrastructure
Private charging	
Short description	Germany has pioneered the approach of using 'fixed values' for private charging. Germany started with a fixed value of private charging for electric vehicles of 2 MWh per year. This value of 2 MWh is a realistic estimate of the yearly private charging on the basis of the average mileage of an average electric car in Germany. Later on, German authorities introduced values for other vehicle categories, using the UNECE standards. Private charging for vans (vehicle category N1) was estimated to be 3.5 MWh. Buses (vehicle category M3) were estimated to charge 87 MWh per year at a private charger. A last addition was made in August 2023 for trucks (communication by German Environment Ministry). Fixed values for private charging were introduced for two types of truck categories. Smaller trucks up to 12 tonnes (vehicle category N2) are awarded 20.6 MWh of annual private charging and bigger trucks exceeding 12 tonnes (vehicle category N3) are awarded 33.4 MWh.

Name of the supporting measure:	Credits for private charging infrastructure
	To ensure the fixed value is accurate and represents the true electricity requirement of the respective vehicle, T&E suggest the use of established mileage factors and vehicle categories under the EU CO ₂ standards for HDVs, based on the Vehicle Energy Consumption Calculation Tool.
Geographical scope	DE
Category/type of measure	Financing – credit mechanism
Rationale	Providing credit to private HDV charging in addition to public charging is deemed by internal experts to be one of the most effective support schemes which member states can put in place to help improve the economic viability of early-stage private charging operations by transport companies. It is widely accepted that private recharging will be responsible for the majority of electricity supplied to HDVs.
Source	202406 T&E briefing crediting private charging HDVs RED
Affected Stakeholder	Charging point operators (CPOs), fuel suppliers
Expected impacts	Effectiveness: About 2.3 MWh of BEV recharging in Germany generates 1 credit of 1 tonne of CO₂ reduced. Benefits: The crediting mechanism is expecting to contribute to the following Carbon intensity reduction targets: - 2024 – 9.25% - 2025 - 10.5% - 2030 – 25% About 2.3 MWh of BEV recharging in Germany generates 1 credit of 1 tonne of CO₂ reduced.²⁶¹ Cost (social and public): There is an initial cost burden for the CPOs, however they will be the ones that benefit from the sale of the credits. The main cost will be borne by the energy suppliers, who are mandated under EU law to contribute a certain percentage of their energy supply from RES. They can either buy the credits or supply renewable energy to meet this quota. There will be no cost on the public, unless some of the cost of meeting such targets is passed on by energy suppliers to the final consumers charging their vehicles. Context: Currently, the MSs that have a private charging mechanism in place are Austria and Germany, with the Netherlands expected to include private crediting from 2026 onwards. Scalability: The mechanism should be easily scalable, but MS will need to set up MRV and auditing requirements. In Germany, private charging is credited as a one-off default consumption value set by the concerned authority. Speed of implementation: The system can be implemented relatively quickly, as the EU mandate already requires the reporting of contributions towards share of renewable energy supplied to the market. Replicability: The mechanism should be easily scalable, but MS will need to set up MRV and auditing requirements. The measure will have the most effect in MS that rely more on private charging instead of public charging installations, and where charging installations are more prominent.

²⁶¹ [20230801 T&E briefing credit mechanism RES-E RED III](#)

Name of the supporting measure:	Credits for private charging infrastructure
Details affecting delivery	None
Source (impacts):	202406 T&E briefing_crediting private charging HDVs RED Implementation+of+RED+III+ENG.pdf

Table 6-9 Anticipatory investments

Name of the supporting measure:	Anticipatory investments
Public charging	
Short description	France - France has put in place a specific regulatory framework for the network development planning associated with renewable productions development (so called “Schémas Régionaux de Raccordement au Réseau des Energies Renouvelables” or “S3REnR”). This framework aims to coordinate producer’s projects and network planning and mutualise costs. In order to reduce the lead time for network adaptation, producers have been asked to give a better visibility about their expected projects, through a declaration on a specific website. Network operators have been asked to start the works as soon as possible based on these evaluations. In terms of consumption, France has set up “decarbonation zones” (industrial areas where an important future demand of electricity is expected to substitute fossil fuels, mainly gas). A strong increase of power needs is foreseen in these areas, thus RTE and CRE have elaborated a framework that allows RTE to over size grid reinforcement projects so that the zone will be able to host future potential users not yet identified but considered very likely to appear in the near future. located. Germany - DSOs are generally obliged to perform anticipatory network expansion according to § 11 of the Energy Industry Act. The major distribution grid operators with more than 100.000 customers are required to create a network development plan and a so-called regional scenario. These documents serve as the foundation for determining the proactive network expansion needs. Future generators and loads, especially renewable energies, electric vehicle charging infrastructure, and buildings, must be considered during this process. Lithuania - Has investment projects related to network development planning in the next 10 years. These investments are coordinated in the network operator's 10-year investment plan and assessed through a technical and economic analysis. These investment projects are related to increasing the capacity of transformer substations, increasing the cross section of overhead line, and are focused on future demand rather than current demand.
Geographical scope	FR, DE, LT
Category/type of measure	Regulation & standards
Rationale	Addressing anticipatory investments improve planning for grid infrastructure requirements, development and connections. This will promote faster connections of planned charging points and secure further investment under better guarantees of connection.
Source	ACER-CEER Paper anticipatory investments.pdf

Name of the supporting measure:	Anticipatory investments
Affected Stakeholder	CPOs, Companies, Individuals
Expected impacts	Effectiveness: With sufficient planning this will not only cover the ETS2 sectors but also the sectors but also aid renewable energy production increases Benefits: N/A Cost (social and public): Context: All countries in the EU are mandated under the AFIR to create greater visibility of grid capacity Scalability: This is significantly scalable and should be made publicly available, to attract private investors for public grid infrastructure. Speed of implementation: This is easily implementable but will take significant planning and collaboration from grid operating bodies to map requirements. Replicability: This measure should be applicable for all MS.
Details affecting delivery	Lack of regulatory framework
Source (impacts):	ENTSO-E Position Paper on Anticipatory Investments

Table 6-10: Streamlining and harmonising administrative processes for grid connections

Name of the supporting measure:	Streamlining and harmonising administrative processes for grid connections
Public & private charging	
Short description	Streamlining and harmonising administrative processes for grid connections is crucial for quicker setup of charging infrastructure. This includes setting clear timelines for connection requests and making capacity maps easily available to prospective charging providers. In the UK some of the actions proposed with Charging Point Operators (CPOs) and Distribution Network Operators (DNOs) were agreed following workshops with key stakeholders carried out over several months. Once a connection offer has been accepted and a timeframe for energisation is provided by the DNO, DNOs are to provide clear guidance on next steps and enhance communication with customers, particularly when giving milestone updates on progress toward energisation. Within the timescales and milestones DNOs provide in line with the GSOP, DNOs to outline/highlight key areas which may lead to delays in energisation (for example, wayleaves, S37 consent). Sometimes local authorities and CPOs are operating across DNO boundaries and need approvals from multiple DNOs – complicating and slowing the process. (2.1) Where essential to CPOs / local authorities working on projects across boundaries, DNOs are to hold joint, cross-boundary surgeries to simplify the work on these projects. The Netherlands is addressing grid congestion through over 100 coordinated actions involving regulators, grid operators, and market stakeholders, as more than 12,000 companies await new or expanded grid connections and up to 90% of businesses face related impacts. These measures focus on three principles: Faster Construction of infrastructure, Better Utilisation of existing networks, and Smarter Insight through digital tools and data-driven planning.

Name of the supporting measure:	Streamlining and harmonising administrative processes for grid connections
Geographical scope	NL, UK
Category/type of measure	Regulation & standards
Rationale	Reduces the amount of time taken to install and connect new charging installations. There is a direct impact on the consumers who are waiting for a charge point to be available. Improving the process of connecting charge points will help deliver charge points at pace, which will benefit all current and prospective EV owners. Increased transparency and clarity of process of connecting charge points will positively impact the relationship between CPOs and DNOs. It will also ensure that CPOs know when their assets will be generating revenue.
Source	https://evboosters.com/ev-charging-news/eu-faces-challenges-in-implementing-hdv-charging-network-by-2030/ https://www.gov.uk/government/publications/improving-the-grid-connection-process-for-electric-vehicle-charging-infrastructure/improving-the-grid-connection-process-for-electric-vehicle-charging-infrastructure#summary-table-of-actions
Affected Stakeholder	CPOs and private companies
Expected impacts	Effectiveness: Streamlining processes will incentivise investors to provide charging infrastructure. It secures their investments and allows for effective planning of national charging networks on a larger scale. This measure can be combined with measures targeting transparency around grid limitations and opportunities. Benefits: For collaboration to expand between the energy and transport sectors, allowing government and industry to deliver over 70,000 public EV charge points in the UK and over 680,000 domestic charge points in England alone Cost (social and public): Burden will be placed on DNOs. Scalability: The mapping and clear administration procedures for connecting to the energy grid will benefit CPOs, however such transparency would also help other sectors, such as energy suppliers (citizens and other enterprises) with enabling fast connection to the grid. Speed of implementation: The process should be relatively quick; however, the structure of the energy market will affect outcomes and cooperation of DSOs and TSOs is required. Nuances in certain MS and the capacity to take part in workshops to identify the best approaches for streamlining administrative processes may take time. Replicability: Harmonising measures should be achievable in some format across all MS. Streamlining administrative processes for grid connections, such as clear timelines for connection requests and accessible capacity maps would help secure market led investment for charging infrastructure.
Details affecting delivery	None - now beginning to see collaboration between the sectors, which has allowed government and industry to deliver over 70,000 public EV charge points in the UK and over 680,000 domestic charge points in England alone.
Source (impacts):	https://www.gov.uk/government/publications/improving-the-grid-connection-process-for-electric-vehicle-charging-infrastructure/improving-the-grid-connection-process-for-electric-vehicle-charging-infrastructure#summary-table-of-actions

Table 6-11 Eurovignette – Truck tolling in favour of ZE HDVs.

Name of the supporting measure:	Eurovignette – Truck tolling in favour of ZE HDVs.
Short description	DE - Germany - Amendment of the Federal Trunk Road Toll Act as of 1.12.2023. This favours ZEV through two adjustments in particular: 1) Introduction of a CO₂-based toll component based on a CO₂ price of EUR 200 per tonne 2) Toll exemption for ZEVs until the end of 2025, after which the infrastructure component of the toll will be reduced by 75%. The coalition agreement of the new Government provides for the extension of the exemption beyond 2026, based on an upcoming proposal of the Commission that was announced in the Action Plan for the European automotive industry. With Germany's reform, toll charges for diesel trucks were significantly increased and now amount to 46,500 EUR per year on average in the long-haul segment. Zero-emission trucks on the other hand receive a big reduction and pay less than 2,000 EUR annually until 2025, and less than 7,000 EUR thereafter. This means that hauliers who purchase one of Daimler's new eActros 600 will save almost 45,000 EUR in their first year of operation. From 2026 onwards, the savings will amount to around 40,000 EUR.
Geographical scope	DE
Category/type of measure	Financing - Tolling mechanism
Rationale	Scaling tolling in favour of HD ZEVs should reduce the cost of ownership for electric trucks in comparison with polluting trucks. This will incentivise companies, to invest in EV fleets in the short term.
Source	202403 Eurovignette briefing update
Affected Stakeholder	SMEs, Heavy duty vehicle operators
Expected impacts	Effectiveness: Cost savings – Between 40,000 and 45,000 Euros per year, per ZE HDV truck. While the measure is effective, the impact will mainly be felt for long-haul freight journeys. Benefits: Tolling in favour of EVs can be implemented across the entire road transport sector. In many cases the tolls are based on weight, where diesel/petrol vehicles are heavier than their EV equivalent across all vehicle categories. It is worth noting that the measure will affect long-haul journeys. Cost (social and public): ZEVs do not contribute to the recovery of the infrastructure costs. Context: A key element of this measure is that it will be implemented on toll roads. Scalability: As mentioned above, the best practice focusses specifically on HD vehicles. However, the measure can also be applied to all vehicle users, both for private and freight transport across multiple vehicle categories. Commercial users are more likely to make purchase decisions based on a change in the total cost of ownership, whereas private users are more likely driven by the upfront cost. Therefore this measure is more effective for commercial users. Speed of implementation: The measure should be easily implementable in the short term. For clarity in the EU the following forecast change to tolling is expected in MS: By March 2024, MS had to vary toll charges for vehicles based on CO₂ emissions. By 2026, distance- and time-based tolls varied by CO₂ are expected to be in force in 17 member states. This means that 62% of EU truck activity (measured in tonne-kilometres) will have a strong incentive to switch to zero-emission vehicles (ZEVs). Replicability: The measure will likely have an impact in MS with more toll roads, and where traffic is more significant. Secondly, there are countries which still apply Vignettes, which are time-based tolls. The tolls will be easier to implement in countries that already have

Name of the supporting measure:	Eurovignette – Truck tolling in favour of ZE HDVs.
	distance-based tolling in place. Concessions in other countries also effect the replicability of new tolls
Details affecting delivery	Concessions: Some MS toll by distance but with long-term concession contracts granted to private operators (so-called 'concession countries'). For example, highways in France and Italy are under such concessions. Croatia, Greece and Portugal are also concession-dominated, while selected highway sections in Ireland and Spain are concession tolled. Some form of concession-controlled distance-based tolls apply in MS which represent up to 36% of EU truck activity today. Existing concession agreements mean that governments can only vary toll charges by agreement with the concession holder (or under a formal procedure. Often signed decades ago, with little regard to climate breakdown, air and noise pollution). For new concession agreements, or where existing contracts are renewed or substantially amended, Member States must implement the new rules adopted in Directive (EU) 2022/362 (that is, variation of tolls based on CO2 emissions), at least until ETS2 applies..
Source (impacts):	202403 Eurovignette briefing update

Table 6-12 Tax incentives for ownership of EVs

Name of the supporting measure:	Tax incentives for ownership of EVs
Short description	Germany - Ownership tax benefits :10-year exemption for BEVs and FCEVs registered until 31 December 2025. Exemption granted until 31 December 2030. - Exemption from the annual circulation tax for vehicles emitting $\leq 95\text{g CO}_2/\text{km}$. - Company tax benefits: Reduction of the taxable amount for BEVs and PHEVs (from 0.5-1% of the gross catalogue price per month). PHEVs must meet further requirements, which become more stringent over time. Additional reduction of taxable amount for BEVs with a gross list price up to €60,000 (0.25-1% of the gross catalogue price per month). Italy - Ownership tax benefits: Electric vehicles are exempt from the annual ownership tax for a period of five years from the date of their first registration. After this five-year period, they benefit from a 75% reduction of the tax rate applied to equivalent petrol vehicles in many regions. - In Valle d'Aosta, the 5-year period is extended to 8 years. Latvia - Ownership tax benefits: If emitting less than 50 g CO₂/km, all vehicles, including cars, goods vehicles, buses, and motorcycles, are exempt from payment of the Vehicle Operation Tax (registration tax). - Company tax benefits: BEVs have a minimum rate of €10.
Geographical scope	DE, IT, LV
Category/type of measure	Financing - Tax incentives

Name of the supporting measure:	Tax incentives for ownership of EVs
Rationale	Tax incentives reduce the total cost of ownership of EVs in comparison with emitting vehicles.
Source	Incentives and Legislation European Alternative Fuels Observatory
Affected Stakeholder	Companies and individuals
Expected impacts	Effectiveness: Tax breaks, help reduce the cost of ownership disparity with emitting vehicles. They work in unison with Tolls to close this gap in the cost of ownership. Benefits: Tax breaks can cover the entire road transport sector, both on a personal and freight level, and can be applied to all vehicle categories. Cost (social and public): This is no cost burden on industry, however there is pressure on the supply of charging infrastructure if the tax incentives drive a rapid change in the vehicle mix. Public authorities will see income fall through tax breaks and will need to invest in charging infrastructure simultaneously. Context: - Scalability: In some MS tax incentives already apply across all vehicle types and are applied to companies and individuals, so they are a very versatile measure. The issue is that like direct subsidies they can be expensive to sustain. Speed of implementation: The measure is quickly implementable. Replicability: Most MS in Europe have some kind of tax break on vehicle ownership or upon registration of an electric vehicle already.
Details affecting delivery	None
Source (impacts):	Incentives and Legislation European Alternative Fuels Observatory

6.2 TRANSPORT - PERSONAL TRANSPORT/MODAL SHIFT

This subsection contains the expanded measures from the long list of measures, in table format for personal transport/modal shift.

Table 6-13 Social leasing

Name of the supporting measure:	Social leasing
Short description	Leasing costs for ZEV are subsidised for low-income households: FR: low-income households can lease an electric car for 100€/month (implemented price is actually cheaper), requirements: living 15km away from work, income below 15.400€, drive more than 8000 km/year. Each vehicle is subsidised with around 13000€. “The total costs for the French scheme (for 50,000 vehicles) are estimated at around 650 million euros, twice as much as initially planned. This cost is directly linked to the high level of subsidy (€13,000 per unit in total) which is now widely considered too high and inappropriate in the light of the success of the scheme and the strong demand.”
Geographical scope	FR
Category/type of measure	Financing - grants/subsidies

Name of the supporting measure:	Social leasing
Rationale	In particular, low-income households with a high dependence on cars are affected by a disproportionate increase in spending on mobility with a rising CO2 price. Targeted vehicle subsidies and an alternative financing instrument (leasing) can avoid high initial investments and enable an early switch to EVs for this vulnerable group.
Source	https://www.ecologie.gouv.fr/mon-leasing-electrique https://www.transportenvironment.org/uploads/files/2024_10_Social_leasing_briefing.pdf
Affected Stakeholder	Low income private HH
Expected impacts	Effectiveness: effectively removes a key hurdle for ZEV procurement for low-income households; coupling with charging infrastructure funding makes sense Benefits: private registrations of new passenger cars; impact dependent on size of funding budget; relevant CO₂ savings if linked to high annual mileage Costs (social and public): high public expenditure per vehicle; increased demand from ZEVs; possibly faster price reduction in this vehicle segment Context: so far only implemented in France Scalability: should be limited to low-income households, high public funding budgets required Speed of implementation: determined by administrative process of application review and vehicle availability Replicability: Dependent on available funding budget; less effective in countries with a high relevance of the used car market; availability of charging infrastructure as a central condition
Details affecting delivery	High subsidy amounts per vehicle are required to achieve an attractive leasing rate. A high level of transparency should be demanded from the leasing companies involved when concluding contracts based on social criteria.
Source (impacts):	https://www.transportenvironment.org/uploads/files/2024_10_Social_leasing_briefing.pdf

Table 6-14 Subsidies based on social criteria, including scrappage schemes

Name of the supporting measure:	Subsidies based on social criteria, including scrappage schemes
Short description	PL: The purchase of ZEV by private HH is subsidized through a bonus. The bonus is depending on family size and income (4,500€-9,500€). For scrapping an old ICEV additional 2,400€-3,900€ are granted, also depending on income and family size. There is also a bonus for leasing a ZEV.
Geographical scope	PL
Category/type of measure	Financing - grants/subsidies
Rationale	Government support for the procurement of ZEVs for private use with a focus on low-income individuals and families reduces a central hurdle for electrification and thus also the impact of a future CO2 price. At the same time, it creates an incentive to scrap particularly old conventional vehicles that are associated with high CO2 and air pollutant emissions.

Name of the supporting measure:	Subsidies based on social criteria, including scrappage schemes
Source	https://notesfrompoland.com/2025/02/05/poland-launches-eu-funded-subsidies-for-buying-electric-cars/
Affected Stakeholder	Private HH Large families Low income HH
Expected impacts	Effectiveness: effectively removes a key hurdle for ZEV procurement for low-income households; coupling with charging infrastructure funding makes sense Benefits: private registrations of new passenger cars; impact dependent on size of funding budget. Costs (social and public): high public expenditure per vehicle; increased demand from ZEVs; possibly faster price reduction in this vehicle segment Context: Low electrification rate among target group to date; commercial of greater importance Scalability: should be limited to low-income households, high public funding budgets required Speed of implementation: determined by administrative process of application review and vehicle availability Replicability: Dependent on available funding budget; less effective in countries with a high relevance of the used car market; availability of charging infrastructure as a central condition
Details affecting delivery	As electric vehicles and new car purchases still play a very minor role in the target groups addressed, the leverage effect is rather limited. Access to low-cost charging infrastructure must also be ensured.
Source (impacts):	As above.

Table 6-15 Emission based taxes and tolls (bonus-malus). Tax advantaged for ZEV and malus for ICEV

Name of the supporting measure:	Emission based taxes and tolls (bonus-malus). Tax advantaged for ZEV and malus for ICEV
Short description	AT, FR, NL: Emission based licensing/registration tax: (AT: NoVA must be paid when registering a car in Austria. Tax rate is based on CO₂ emissions (tax rate= (CO₂-emission - 97 g/km)/5). Maximal tax rate is 80%. As soon as emission is higher than 155g/km there is an additional malus of 80€/g; FR: Fully electric vehicles and plug-in hybrids are for 50% exempted from registration fees. And 100% exempted form licence plate registration) AT, DEN, SE, LN: Emission based ownership/road tax: Based on CO₂-emissions of car a tax has to be paid yearly by private households. (AT: for all vehicles below 3,5 t, including motorcycles; from 74€/year to 1459€/year; DEN: Ownership taxes are based on CO₂ emissions. Zero-emission cars and cars with CO₂ emissions of maximum 58g/km pay the minimum semi-annual tax rate of DKK 390; SE: yearly emission-based car tax: base for carbon emitting vehicles 360 SEK + 11 SEK per gram CO₂/km exceeding 111 grams. Bonus malus: high emitting cars have to pay more, low/no emitting cars have to pay less.) BE, NO: Emission based toll. Tolls have to paid by all vehicles based on their emissions. ZEV have to pay less or are exempt of the fees. High emitting cars may pay more.

Name of the supporting measure:	Emission based taxes and tolls (bonus-malus). Tax advantaged for ZEV and malus for ICEV
Geographical scope	FR, NL, AT, DEN, SE, BE, NO
Category/type of measure	Financing - Tax incentives, Financing – tolling mechanism
Rationale	In general, there are 3 starting points for the privileging of ZEVs through bonus-malus approaches: 1) at the time of purchase through a differentiated registration tax, 2) in the annual motor vehicle tax or also via 3) the road toll. The approaches can also be combined. They have the effect of changing the total usage costs in favour of ZEVs, but do not place an additional burden on the state budget and can therefore be sustained for longer. However, note that without further measures (see e.g. social leasing), households with low incomes that are unable to finance the switch can also face additional costs
Source	https://alternative-fuels-observatory.ec.europa.eu/transport-mode/road/france/incentives-legislations https://www.finanz.at/kfz/nova/ https://www.oeamtc.at/thema/steuern-abgaben/motorbezogene-versicherungssteuer-18178410 ; https://www.einfach-leben.at/wp/wp-content/uploads/Tabelle-KFZ-Steuer.pdf https://www.aldautomotive.dk/en/my-company-car/ownership-tax Norwegian EV policy - Norsk elbilforening Brussels develops intelligent kilometre charge - POLIS Network
Affected Stakeholder	Car owner and car operator (private and commercial)
Expected impacts	Effectiveness: effectively reduces the cost disadvantage of ZEV for all users; coupling with charging infrastructure funding makes sense. Private users are more sensitive to price changes at the time of the purchase (registration tax) whereas commercial users to changes in the total cost of ownership (annual tax and tolls). Benefits: new car registrations (and stock); high impact, as conventional vehicles are also affected Costs (social and public): Implementation possible without higher government spending; higher costs for owners of conventional vehicles Context: Implementation so far mainly in Western and Northern Europe. Scalability: Implementation may have to be linked to different preconditions (e.g. existence of a national registration tax or car toll); but also, flexibility through different implementation variants Speed of implementation: Relevant fast implementation possible due to different implementation variants Replicability: high replicability possible; high potential in countries with sufficient charging infrastructure and high proportion of new registrations
Details affecting delivery	The CO ₂ -orientation of the tax and levy system creates strong and sustainable monetary incentives to switch to ZEVs. However, this will only happen if charging infrastructure is also available. In addition, the ability of low-income households to react is limited in the short term due to the low number of ZEVs on the used car market and limited financing resources.
Source (impacts):	Internal expert.

Table 6-16: Reduced and simplified ticket pricing for public transport

Name of the supporting measure:	Reduced and simplified ticket pricing for public transport
Short description	The KlimaTicket Ö, launched in Austria in 2021, is a nationwide public transport pass aimed at encouraging public transport use to reduce greenhouse gas emissions and air pollution. It offers a single subscription covering all public transport modes across the country and is available to all residents, with discounts for specific groups. Introduced partly to restore ridership after the COVID-19 pandemic, the initiative is supported by major government investments in upgrading and expanding transport infrastructure to meet rising demand. The OV-chipkaart was first launched in Rotterdam in 2005 and later expanded across the country in 2010. It is a unified national fare system used by all major public transport operators on the Dutch mainland. Since mid-2022, the Netherlands has introduced OVpay, a system complementary to the OV-chipkaart, which allows users to check in to public transport using contactless debit or credit cards and mobile devices.
Geographic scope	AT, NL
Category/type of measure	Regulation & standards
Rationale	The KlimaTicket Ö was implemented to overcome key barriers to public transport use by offering an affordable and integrated travel solution. Priced at around three euros per day, it reduces financial obstacles and simplifies access by unifying all transport modes under a single ticket. The rationale behind the initiative also includes a strategic focus on pairing increased affordability with major public investment in transport infrastructure and service quality. This dual approach, stimulating demand while expanding supply, aims to prevent issues like overcrowding and service degradation, ensuring the system remains attractive and effective for users. The OV-chipkaart and OVpay simplify the way users access public transport by unifying both payment methods and the tracking of public transport usage.
Source	KlimaTicket NS Annual Report 2024
Affected Stakeholder	Households
Expected impacts	Effectiveness: The reduction in CO₂ emissions is estimated in 65,000 tonnes of CO₂e in 2021. Benefits: By August 2023, 250,000 had been sold, meaning that nearly 3% of the Austrian population held a nationwide KlimaTicket Ö. When regional tickets are included, the share rises to 13%. Costs (social and public): The measure is partially funded through ticket sales, which contribute to its financial sustainability. In 2022, the federal government allocated €160 million to support the initiative. Regional governments finance their own versions of the KlimaTicket but receive €180 million from the central government to support implementation and expand public transport services. Context: Implemented in Austria, both at the national and regional level. Other Member States have different measures in place to promote public transport (e.g., Germany's Deutschlandticket, Luxembourg's free public transport). OV-chipkaart and OVpay implemented at the national level in the Netherlands. Scalability: The KlimaTicket Ö has shown strong scalability, expanding from a local initiative in Vienna to a nationwide program that effectively serves both urban and rural areas. Its integrated subscription model supports long-distance and multimodal travel, with potential for further expansion to include services like bike-sharing. Austria's experience indicates that

Name of the supporting measure:	Reduced and simplified ticket pricing for public transport
	similar models could be replicated in other regions or sectors, given adequate infrastructure and coordination. The OV-chipkaart was implemented as a payment method and then expanded and complemented by other services. Speed of implementation: The implementation speed of the KlimaTicket Ö depended on factors such as existing transport structures, network capacity, and central coordination. Austria's prior experience with regional annual tickets provided a strong foundation for national expansion. The initiative was developed over 18 months, with pre-sales starting in October 2021 and full rollout across all federal regions by January 2022. This swift implementation was enabled by political support, effective stakeholder coordination, and established regional models. OV-chipkaart was introduced in Rotterdam in 2005 and reached national coverage in 2014. Speed of implementation would be increased now, due to technological progress. Replicability: The KlimaTicket Ö model is replicable in other Member States, offering an affordable, self-financing alternative to fully subsidised systems. With strong coordination and investment, it can be adapted to different contexts, especially in urbanised countries with high car use and climate ambitions.
Details affecting delivery	-
Source (impacts):	Austria's "KlimaTicket" to promote low-carbon mobility OECD Fare's Fair: Experiences and Impacts of Fare Policies ClimateTicket Report 2022 https://www.bmimi.gv.at/themen/mobilitaet/1-2-3-ticket/fakten.html#:~:text=Rechtliche%20Umsetzung%3A%20Zustimmung%20%C3%BCber%20Parteigrenzen,April%202021%20in%20Kraft%20getreten.

Table 6-17: On-demand transport

Name of the supporting measure:	On-demand transport
Short description	Flexible, demand-responsive transport services (DRT/ODT) that adapt routes and schedules to real-time passenger needs, bridging gaps in conventional public transport and improving accessibility, particularly in rural or underserved areas.
Geographical scope	BE, DE, ES, NL (similar schemes implemented in other MSs)
Category/type of measure	Regulation & standards
Rationale	Addresses structural limitations of conventional public transport in low-density or dispersed demand areas, reducing car dependence, enhancing accessibility, and contributing to modal shift and emission reductions.
Source	DNV 2018-03 DELIJN DE en (3).PDF SMARTA-GP-Ring-a-Link.pdf The SMARTA Project » Vallibus's Connecta't 5.-Vallibus-Connectat-ES.pdf 9-Texelhopper-DRT-NL.pdf

Name of the supporting measure:	On-demand transport
	De Lijn Flex - De Lijn
Affected Stakeholder	Passengers in rural/suburban/underserved areas, low-income households, elderly, students, tourists, people with disabilities.
Expected impacts	Effectiveness: Improves accessibility and service responsiveness; measurable ridership growth (e.g. sprinti, Ring a Link). Potential reduction in CO2 emissions due to reduced use of private cars and inefficient public transport. Benefits: Enhances social inclusion, supports modal shift, reduces emissions (especially with electrified fleets), strengthens multimodal integration. Costs (social and public): Requires subsidies, digital platforms, vehicles, and driver resources; operational costs can be high with low occupancy. The reliance on public funding varies depending on the structure of the scheme, operational costs and integration with public transport. Context: Implemented in several municipalities/regions across different MSs. Scalability: Proven transition from pilots to region-wide coverage (e.g. sprinti, De Lijn Flex); adaptable to community and tourism contexts. Speed of implementation: Pilots scaled up to regional services within 2–3 years when funding, regulation, and user engagement are in place. Heavily dependent on prior existence of digital infrastructure, alongside ability to connect to standard public transport schemes. Replicability: High across EU regions with adequate funding and digital infrastructure; requires provisions for digitally excluded groups.
Details affecting delivery	-
Source (impacts):	See above.

Table 6-18: Urban transport planning towards modal shift - Superblock model

Name of the supporting measure:	Urban transport planning towards modal shift - Superblock model
Short description	Urban planning plays a key role in reorganising space to prioritise public transport and active mobility over private cars, especially in cities with limited public space. Superblocks are a specific tool that restrict car traffic in designated areas to free up space for sustainable transport and community use. By limiting access to internal roads, removing parking, and ensuring public transport accessibility, superblocks reduce car dependence and offer climate and health benefits. They primarily target residents, encouraging a shift to alternative transport modes.
Geographic scope	ES, AT, DE
Category/type of measure	Regulation & standards
Rationale	Superblocks are implemented as a response to the persistent dominance of car-bound mobility, a major source of urban GHG emissions. Traditional urban planning and institutional structures often favour car infrastructure, making it difficult to achieve meaningful shifts to public or active transport. Superblocks address this by reducing space allocated to cars and

Name of the supporting measure:	Urban transport planning towards modal shift - Superblock model
	restricting vehicle access within designated zones, thereby encouraging a shift to more sustainable transport modes. Their success often depends on reorganising nearby public transport networks to ensure viable alternatives to car use.
Source	The Superblock model: A review of an innovative urban model for sustainability, liveability, health and well-being - ScienceDirect https://www.kiezblocks.de/
Affected Stakeholder	Households
Expected impacts	Effectiveness: Effectively incentivises the adoption of alternative transport modes as the space dedicated to cars is reduced. Higher effectiveness to be reached with complementary measures focusing on public transport development. Benefits: In Barcelona, the Barcelona City Council estimated that the implementation of the 503 superblocks in the city would resolve in a 19.2% reduction in car usage, and translated public transport, cycling or walking. Costs (social and public): The measure does not require large public expenditure to be set up. Most changes to urban mobility do not require significant investment, although temporary and permanent installations to increase quality of life in affected areas do require investment. If coupled with an improvement of public transport, such investments should also be considered. Context: Implemented in Spain (Barcelona), Austria (Vienna) and Germany (Berlin), although with different modalities. Scalability: The scalability of superblocks depends on both technical and social factors. Grid-like urban layouts and strong public transport networks support implementation, though additional investment may be needed to boost capacity. Social acceptance can be a barrier, with concerns over reduced mobility or gentrification, as seen in Barcelona's Poblenou. To maximise impact and acceptance, superblocks should be prioritised in areas where they are most effective, such as more deprived neighbourhoods where benefits are greater. Speed of implementation: Superblocks can be implemented in the short term, with planning, consultation, and public participation being the most time-consuming phases. Engaging citizens early helps build support and reduce resistance. Planning must also account for diverse stakeholder needs, including local businesses and emergency services. While full implementation may take several years, as seen in Vienna's four-year Supergrätzl project, positive effects (like reduced traffic) often appear within the first year of rollout. Replicability: The superblock model is highly replicable in urbanised Member States, particularly where car use remains high and public transport measures are underused. It offers strong potential to reduce traffic and support urban decarbonisation.
Details affecting delivery	-
Source (impacts):	Changing the urban design of cities for health: The superblock model - ScienceDirectITS European Congress 2023 Lisbon.pdf

Table 6-19 Tax deductibility for ZEVs

Name of the supporting measure:	Tax deductibility for ZEVs
Short description	Tax deductibility of vehicle purchase for companies depend on the emission-level. High-emission cars cannot be deducted completely. (BE: tax deductibility for company cars depending on type of fuel and CO2 emissions. Maximum deductibility for ICE purchase 2025: 75%, 2026: 50%; 2027: 24%; 2028: 0%)
Geographic scope	BE
Category/type of measure	Financing - Tax incentives
Rationale	In view of higher procurement costs, the use of ZEVs is not yet sufficiently attractive for many companies. Furthermore, investments must be made in the development of charging infrastructure. The higher tax deductibility of ZEV procurement counteracts these obstacles. The decreasing deductibility of ICEVs makes it easier to plan and creates an increasing incentive for the procurement of ZEV for company fleets.
Source	https://www.kbcbrussels.be/business/en/products/credit/fiscaliteit-bedrijfswagens.html#:~:text=The%20tax%20deductibility%20of%20the%20vehicle%20and%20fuel,minimum%20of%2050%25%20and%20a%20maximum%20of%20100%25.;Taxation%20of%20company%20cars%20 %20LeasePlan%20Belgium
Affected Stakeholder	Companies
Expected impacts	Effectiveness: effectively reduces the cost disadvantage of ZEV for companies; coupling with charging infrastructure funding and potentially ZEV mandate makes sense Benefits: commercial registration with share of 60% of new car registrations; high impact, as conventional vehicles are also affected Costs (social and public): Tax shortfalls due to higher ZEV deductibility can be offset by lower ICEV deductibility; higher costs for owners of conventional vehicles Context: Implementation so far only in few countries, but highly effective Scalability: No restrictions – applicable to all companies Speed of implementation: On the basis of previous experience, rapid implementation should be possible. Replicability: high replicability possible; high potential in countries with a high proportion of commercial registrations and good availability of charging infrastructure
Details affecting delivery	The availability of ZEV models and charging infrastructure must be further expanded. The development of the second-hand car market and the residual value of ZEVs is also important.
Source (impacts):	https://alternative-fuels-observatory.ec.europa.eu/general-information/news/belgium-record-year-bevs-285-market-share-2024

Table 6-20 Taxation of private use of company cars

Name of the supporting measure:	Taxation of private use of company cars
Short description	Taxation deductions regarding the private use of company cars are usually linked to the car's emissions. Deduction is higher for low emitting cars/ ZEV. BE: Private users of company cars have to pay a monthly solidarity contribution (depending on emissions and fuel type; ZEV's contribution is reduced to a minimum amount) AT: For employees, the private use of a zero-emission company car, and the electricity to charge it, are exempt from taxation
Geographical scope	BE, AT
Category/type of measure	Financing - Tax incentives
Rationale	Company cars are often allowed to be used for private purposes. The tax deductibility of the monetary advantage associated with private use is a decisive factor in determining the attractiveness of different powertrain variants. The higher deductibility of ZEVs increases the monetary advantage for company car users if they choose a ZEV over an ICEV.
Source	https://www.kbcbrussels.be/business/en/products/credit/fiscaliteit-bedrijfswagens.html https://www.bmf.gv.at/themen/steuern/arbeitnehmerinnenveranlagung/pendlerfoerderung-das-pendlerpauschale/sachbezug-kraftfahrzeug.html
Affected Stakeholder	Employees
Expected impacts	Effectiveness: effectively increases attractiveness of ZEVs for employees; coupling with private charging infrastructure funding Benefits: high impact, as conventional vehicles are also affected and company cars of high relevance concerning new car registrations Costs (social and public): Tax shortfalls due to higher ZEV deductibility could be offset by lower ICEV deductibility; higher costs for owners of conventional vehicles Context: Implementation so far only in few countries, but highly effective Scalability: No restrictions – applicable to all companies Speed of implementation: On the basis of previous experience, rapid implementation should be possible. Replicability: high replicability possible; high potential in countries with a high proportion of commercial registrations and good availability of charging infrastructure
Details affecting delivery	The availability of ZEV models and charging infrastructure must be further expanded. The development of the second-hand car market and the residual value of ZEVs is also important.
Source (impacts):	Internal expert.

Table 6-21 ZEV quotas on company fleets renewals

Name of the supporting measure:	ZEV quotas on company fleets renewals
Short description	Companies have to meet quotas for renewals to their company fleet. If this regulation applies may depend on the company's size. FR: LOM: company fleets with more than 100 vehicles must meet the quota of electric vehicles on fleet renewals of 20% (2024), 70% (2030), 95% (2032)
Geographical scope	FR
Category/type of measure	Regulation & standards
Rationale	Mandatory targets for ZEVs for larger corporate fleets create a planning certainty that all parties can align themselves with. For example, the expansion of the charging infrastructure can be aligned with this, and the use of ZEV can be extended from initially very suitable applications to increasingly challenging ones. In addition, the share of ZEV in the second-hand market can be well planned in advance on this basis.
Source	https://te-cdn.ams3.cdn.digitaloceanspaces.com/files/EN_2024_02_Summary_Reform-French-company-car-law.pdf
Affected Stakeholder	Companies
Expected impacts	Effectiveness: effectively increases ZEV uptake in company fleets; coupling with charging infrastructure funding and increased tax deductibility of ZEVs Benefits: commercial registration with share of 60% of new car registrations; high impact if mandatory and ambitious targets are set Costs (social and public): Requires companies to spend more on their fleets and to make additional investments in charging infrastructure. Context: So far only implemented as non-binding targets at national level; particularly problematic for smaller companies due to high additional costs when converting fleets. Scalability: Should initially be limited to larger fleets Speed of implementation: A quick introduction is conceivable, but target values should only increase slowly. Replicability: high replicability possible; high potential in countries with a high proportion of commercial registrations and good availability of charging infrastructure
Details affecting delivery	FR: Only targets 0,1% of companies. 2/3 rd of companies failed to achieve the quota. Law doesn't include control or penalties.
Source (impacts):	https://te-cdn.ams3.cdn.digitaloceanspaces.com/files/EN_2024_02_Summary_Reform-French-company-car-law.pdf

Table 6-22 Minimum e-mobility infrastructure requirements at buildings, parking spaces

Name of the supporting measure:	Minimum e-mobility infrastructure requirements at buildings, parking spaces
Short description	DE: Electric Mobility Infrastructure Act (GEIG), implementing Article 8(2) to (6) of Directive (EU) 2018/844 (since 2021):

Name of the supporting measure:	Minimum e-mobility infrastructure requirements at buildings, parking spaces
	When residential buildings with at least 5 parking spaces or non-residential buildings with at least 6 parking spaces are newly built, there must be a protective tube installed for every third parking space (every third for non-residential buildings). Non-residential buildings need to build one charging point. If buildings undergo major renovation, similar regulations take place. From 2025 all non-residential buildings with more than 20 parking spaces must install a charging point. BE: Mandatory availability of charging points at non-residential buildings FR: obligations for non-residential/ mixed buildings to build charging infrastructure if more than 20 parking slots and other regulations for renovation etc.
Geographical scope	DE, BE, FR
Category/type of measure	Regulation & standards
Rationale	Car owners who live in rented or multi-family houses are not always able to install or use a private charging infrastructure in the building without restrictions. At the same time, this often remains the simplest and most cost-effective charging option. In view of this, it is essential enabling the setup of charging infrastructure in such places in a low-threshold manner, by means of requirements for landlords or property owner associations.
Source	https://www.bmwk.de/Redaktion/DE/Artikel/Service/Gesetzesvorhaben/gebaeude-elektromobilitaetsinfrastruktur-gesetz.html https://www.pwclegal.be/en/news/update-on-the-requirement-of-charging-points-at-non-residential-.html
Affected Stakeholder	Landlords, private households
Expected impacts	Effectiveness: The German GEIG, in combination with WEemoG, addresses a main barrier for potential e-mobility users living in apartment buildings. Benefits: Huge share of the sector and its GHG emissions potentially supported by the measure (passenger cars ~ 60 % of road transport; share of apartment house inhabitants depends on MS characteristics – Germany: 70 % of households don't own a detached house) Costs (social and public): No financial contribution from public authorities. Cost burden for industry potentially high (around 1,000 to 7,000 € per charging point). Context: In Germany: Ongoing public discussion on how such requirements inhibit housing construction.
Details affecting delivery	According to practitioners, obligations resulting from the German GEIG are too often unknown to municipal administration and therefore lacks effectiveness.
Source (impacts):	As above.

Table 6-23 Non-discriminatory access to public charging infrastructure

Name of the supporting measure:	Non-discriminatory access to public charging infrastructure
Short description	Controlling the implementation of the non-discriminatory clause of the AFIR ²⁶² at national level: “Prices charged by operators of publicly accessible recharging points shall be reasonable, easily and clearly comparable, transparent and non-discriminatory, regardless of the electric mobility service provider. Operators of publicly accessible recharging points shall not discriminate, through the prices charged, between end users and mobility service providers or between different mobility service providers. However, the level of prices may be differentiated, but only if the differentiation is proportionate and objectively justified.”
Geographical scope	EU
Category/type of measure	Regulation & standards
Rationale	In order to ensure fair competition and attractive prices at public charging infrastructure, it is important that electricity providers (e-mobility providers – EMP) are not discriminated by charging point operators (CPO) through excessive costs. This is already legally established through AFIR. However, there is still a lack of enforcement at the national level.
Source	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1804
Affected Stakeholder	Charge point operators, e-mobility providers
Expected impacts	Effectiveness: increases price competition at charging stations and leads to lower price differences regardless of the contract chosen with a charging electricity provider Benefits: - Costs (social and public): More favourable charging price at public charging infrastructure; reduces the market power of large CPOs Context: Non-discrimination clause already implemented in the AFIR, but not yet sufficiently implemented at country level Scalability: should be applied to all CPOs; as a condition for the allocation of public spaces for charging infrastructure. High impact expected for individuals that regularly use public charging. Speed of implementation: Fast implementation possible Replicability: AFIR forms the basis for implementing the measure in all countries
Details affecting delivery	Non-discriminatory access to public charging infrastructure must be monitored at national level.
Source (impacts):	Internal expert.

²⁶² [Alternative Fuels Infrastructure - European Commission](#)

Table 6-24 Fair allocations of public land for charging infrastructure and prevention of monopoly formation

Name of the supporting measure:	Fair allocations of public land for charging infrastructure and prevention of monopoly formation
Short description	Ensuring fair competition for tenders for charging infrastructure. Prevention of monopoly formation. DE: According to the Federal Cartel Office, public authorities such as cities and municipalities are not acting in a sovereign capacity when allocating public spaces for charging infrastructure, but in an economic capacity. When offering land, dominant local authorities must therefore observe the prohibition of abuse under antitrust law. Objectively unjustified preferential treatment, particularly of their own municipal utility, must be avoided.
Geographical scope	DE
Category/type of measure	Regulation & standards (competition)
Rationale	According to experts, public land for the construction of charging infrastructure is sometimes awarded without a competitive tendering process, particularly at the municipal level. This sometimes results in municipal and regional monopolies for public charging infrastructure, which prevent attractive pricing in a competitive environment. Consistent application of public procurement law would strengthen competition.
Source	https://www.bundeskartellamt.de/SharedDocs/Publikation/DE/Sektoruntersuchungen/Sektoruntersuchung_Ladesaeulen_Abschlussbericht.pdf?__blob=publicationFile&v=3
Affected Stakeholder	Charge point operators, e-mobility providers
Expected impacts	Effectiveness: increases the number of CPOs and avoids regional monopolies; this results in greater competition and avoids monopoly and high price differentials for public charging Benefits: - Costs (social and public): more favourable charging price at public charging infrastructure; reduces the market power of large CPOs Context: there is a risk of monopolies, particularly at municipal level, as charging infrastructure is often set up by municipal utilities without competition Scalability: Public land should be allocated on a competitive basis as standard Speed of implementation: only relevant for the allocation of new public spaces for charging infrastructure Replicability: Applicable in countries with comparable deficits in the allocation of public land
Details affecting delivery	None

Name of the supporting measure:	Fair allocations of public land for charging infrastructure and prevention of monopoly formation
Source (impacts):	Internal expert

Table 6-25 Price transparency for public charging

Name of the supporting measure:	Price transparency for public charging
Short description	AFIR includes regulation for transparent charging prices. DE: Common standards should create interoperability and decisively advance the electromobility ecosystem. A first step towards national implementation is to record the status quo in the National Strategy Framework (NSR). This defines specific individual measures to achieve the targets. The final version is to be submitted to the EU Commission for publication by 31 December 2025. CPOs of publicly accessible charging points must provide static and dynamic data on their charging facilities free of charge by 14 April 2025 at the latest (Art. 20, Para. 2, 3, 4). A transitional period until 14 April 2026 is provided for the provision of data in the DATEX II standard. To this end, operators shall set up an application programming interface (API) that enables non-discriminatory and unrestricted access to the required data. By 2026 there will be national online services with information about ad-hoc charging prices called “Nationaler Zusatzpunkt”
Geographical scope	EU, DE
Category/type of measure	Regulation & standards
Rationale	Price transparency is necessary to create competition between providers of public charging infrastructure and to give customers the opportunity to access locations with favourable charging prices. Today, the price for ad hoc charging in particular cannot be known in advance. AFIR already sets out requirements for charging infrastructure operators to publish charging prices. However, this now needs to be implemented at country level. Experts assume that it will be implemented across Europe by 2026
Source	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1804 https://nationale-leitstelle.de/ladeinfrastruktur-im-eu-kontext/ https://www.bmwk.de/Redaktion/DE/Artikel/Service/Gesetzesvorhaben/gebaeude-elektromobilitaetsinfrastruktur-gesetz.html
Affected Stakeholder	Charge point operators, e-mobility providers
Expected impacts	Effectiveness: Price transparency increases competition and makes ad-hoc charging without a fixed contract at public charging infrastructure more attractive Benefits: transport sector only; avoids high price differentials for public charging Costs (social and public): More favourable charging price at public charging infrastructure; reduces the market power of large CPOs

Name of the supporting measure:	Price transparency for public charging
	Context: Requirement for price transparency by AFIR; however, national implementation is still pending or in the process of being realised Scalability: to be applied to all public charging points Speed of implementation: Implementation at national level over the next two years Replicability: Implementation in all EU MS in accordance with AFIR requirements
Details affecting delivery	None
Source (impacts):	Internal expert.

6.3 BUILDINGS - RENEWABLE-BASED & RENEWABLE-READY HEATING TECHNOLOGIES

This subsection contains the expanded measures from the long list of measures, in table format for buildings - renewable-based & renewable-ready heating technologies.

Table 6-26 Upgrading Training Assistance Act (Aufstiegs-BAföG)

Name of the supporting measure:	Upgrading Training Assistance Act (Aufstiegs-BAföG)
Short description	Germany offers financial support to individuals participating in vocational training through the Upgrading Training Assistance Act, commonly known as Aufstiegs-BAföG. This program provides funding to cover training costs and living expenses for those attending vocational training courses aimed at career advancement. In 2023, approximately 192,000 individuals received funding under this scheme. While not exclusively for the renewable energy sector, this support is available to trainees across various fields, including those pursuing qualifications in low-carbon technologies.
Geographical scope	DE
Category/type of measure	Financing - grants/subsidies
Rationale	Financial support for individuals during vocational training makes reskilling more financially viable, allowing trainees to pay for their living expenses during their training.
Source	https://www.bmbf.de/EN/Education/ContinuingEducationAndTraining/FinancialSupport/financialsupport.html
Affected Stakeholder	Trainees, Professionals
Expected impacts	Effectiveness: By reducing financial barriers, the program encourages more individuals to pursue training in renewable-ready heating technologies, thereby increasing the skilled workforce. Complements <i>all</i> measures aimed at increasing numbers of installations by addressing the bottleneck of installer shortages.

Name of the supporting measure:	Upgrading Training Assistance Act (Aufstiegs-BAföG)
	Benefits: While not exclusively focused on renewable energy, the program's inclusivity allows for significant impact in this sector by supporting relevant vocational training. Specific advantages for trainees on renewable heating courses could further improve uptake of these course specifically. Cost (social and public): In 2023, approximately €880 million was allocated to the program, supporting around 192,000 individuals. Context: Germany's vocational education training system is among the best in the world, so it may be easier in Germany to persuade people to take courses. Scalability: The program's framework allows for expansion, enabling more individuals to receive support as demand for renewable energy professionals grows. Speed of implementation: The measure focuses on making training that already exists more financially feasible for trainees. As such, the implementation can be achieved quickly. Training itself may take anywhere from a day to several months per course. Replicability: Other countries can adopt similar financial support mechanisms to address skills shortages in their renewable energy sectors, tailoring the program to local contexts.
Details affecting delivery	Decisions required on <i>who</i> is eligible, <i>how much</i> support is provided, how to apply, and how to ensure <i>awareness</i> of the programme.
Source (impacts):	https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/germany-u3

Table 6-27 Image campaign to attract young talent to the skilled trades

Name of the supporting measure:	Image campaign to attract young talent to the skilled trades
Short description	The German Handwerk Image Campaign, running since 2010, aims to highlight the diverse career opportunities in skilled trades. It promotes a modern image of craftsmanship and encourages young people to pursue apprenticeships in one of over 130 trades. Installers of renewable-ready technologies are included in this scheme.
Geographical scope	DE
Category/type of measure	Awareness, technical support and training
Rationale	Improving the image of the skilled trades should drive more young people to pursue these careers, leading to an increase in the number of installers available for renewable-based and renewable-ready heating technologies.
Source	https://www.zdh.de/ueber-uns/imagekampagne-handwerk/
Affected Stakeholder	Young people, Skilled trades sector
Expected impacts	Effectiveness: Complements financial incentives aimed at promoting vocational training in sustainable energy sectors. Benefits: An influx of skilled professionals can accelerate the adoption and maintenance of renewable heating systems, contributing to significant greenhouse gas emission reductions.

Name of the supporting measure:	Image campaign to attract young talent to the skilled trades
	Cost (social and public): Funded by the German Confederation of Skilled Crafts (ZDH) and supported by various stakeholders. By enhancing the skilled labour pool, the campaign supports industry growth without directly imposing costs on consumers. Investing in the image of skilled trades yields societal benefits, including job creation and progress towards environmental sustainability goals. Context: Germany's vocational education training system is among the best in the world, so it may be easier in Germany to persuade young people to learn a trade. Scalability: Information measures are easy to roll out and expand. Speed of implementation: Information measures are easy and fast to roll out. Replicability: As an information measure, this should be easily replicable in other member states, though cultural differences may require slightly different messaging or medium.
Details affecting delivery	Each Member State will need to consider just what it is that would make the youth in the country interested in learning a trade. If workers in the skilled trades do not have good working conditions in a Member State, this measure may not be suitable.
Source (impacts):	https://www.cedefop.europa.eu/en/news/germany-rebranding-apprenticeships-skilled-craft-trades-combat-labour-shortage https://www.gisreportsonline.com/r/germany-vocational-education-system/

Table 6-28 Mandatory energy and carbon requirements for new and existing buildings

Name of the supporting measure:	Mandatory energy and carbon requirements for new and existing buildings
Short description	Germany - (Gebäudeenergiegesetz (GEG)): This act creates a body of rule regarding energy requirements for new and existing buildings, for the use of renewable energies for the provision of heating and cooling in buildings. Three core instruments have been adopted: 1) 65% Renewable Heat Requirement for the building stock: from June 30, 2026, in municipalities with a population of 100,000 or more and after June 30, 2028, in municipalities with a population of up to 100,000, all heating system replacements must ensure that at least 65% of energy comes from renewable sources. This is considered the most effective measure due to its impact on the "Heating Market Dynamics," ensuring compliance with energy efficiency (EE) standards for heating systems. 2) 65% Renewable Heat Requirement for new buildings: since January 2024, heating systems with 65% renewable energy must be installed in new builds. There are transitional periods, e.g. for connection to a future heating network. The obligation applies to all new buildings for which a building application is submitted from January 2024. Outside a new-build area: same regulation as for the building stock 3) Enhanced Energy Standards in the Building Energy Act (GEG). New Buildings: from January 2025, energy standards for residential and non-residential new constructions have to meet the EH/EG-55 standard for annual primary energy demand. Existing Buildings: when renovating a building, minimum standards must be observed, for example for the thermal insulation of the building envelope or the energy standard of the heating system. Various replacement and retrofitting obligations are also stipulated,

Name of the supporting measure:	Mandatory energy and carbon requirements for new and existing buildings
	which owners must comply with - regardless of whether they carry out a renovation (exceptions apply). France - Regulation for new construction (RE2020): France's RE2020 regulation enforces strict energy and carbon limits for buildings. To achieve EPC A or B, only renewable energy (RES) and heat pumps (HP) are allowed for heating. New dwellings must use low-carbon systems like heat pumps or biomass. From 2025, gas heating is effectively banned due to CO₂ limits. The project's aim was to help energy-poor households (particularly tenants in the private rented sector and - in descending order - also owner occupiers and tenants in social housing) and convince and financially support their landlords to carry out works (with a subsidy of up to 50% of the total cost and a maximum amount of EUR 2,000).
Geographical scope	DE, FR
Category/type of measure	Regulation & standards
Rationale	Binding standards help to overcome the lack of incentives by making certain measures mandatory on the one hand and ensuring that voluntary refurbishment measures are carried out in an efficient manner on the other hand.
Source	https://www.bmwsb.bund.de/Webs/BMWSB/DE/themen/bauen/energieeffizientes-bauen-sanieren/gebaeudeenergiegesetz/gebaeudeenergiegesetz-node.html https://www.ecologie.gouv.fr/politiques-publiques/reglementation-environnementale-re2020
Affected Stakeholder	Property owners
Expected impacts	Effectiveness: As requirements are mandatory, the policy should result in heating system upgrades, but this measure requires complementary feasibility measures to be put in place to improve feasibility to be effective. Benefits: Both regulations target the building sector comprehensively, encompassing new constructions and, progressively, existing buildings. GEG: Expected annual reductions in GHG emissions are equal to 2 Mt in 2025, increasing to 8.4 Mt in 2040. This considers direct net reductions in GHG emissions (excluding effects on transformation sector). Cost (social and public): Property owners bear the initial investment costs for upgrading heating systems, which may be partially passed on to tenants through rent adjustments. The costs will likely be passed on to tenants through rent increases unless regulated against. This may have social costs as the cost of living rises. Context: A substantial portion of Germany's building stock was constructed before the implementation of modern energy efficiency standards. Consequently, many buildings are energy inefficient, necessitating extensive retrofitting to meet current energy and carbon requirements. Scalability: The GEG has scalability built into its design through its phased approach. RE2020 applies to all new construction already, which has fewer complications than retrofits. Speed of implementation: With GEG's phased approach, initial savings can be achieved relatively quickly, with increasing effectiveness over time as the measure expands.

Name of the supporting measure:	Mandatory energy and carbon requirements for new and existing buildings
	Replicability: Countries still heavily reliant on gas or oil heating (e.g., Poland, Czech Republic) could implement similar mandates to accelerate the transition to renewables. However, the pace of implementation would depend on whether affordable alternative heating systems (heat pumps, district heating) are readily available to be installed, which may not be the case in countries where there is significant skills scarcity. In countries with weaker regulatory enforcement, it may be difficult to enforce compliance. Specifically, regarding France's RE2020, countries where new construction rates are low would see little benefit.
Details affecting delivery	Enforcing a mandatory standard doesn't necessarily mean that building owners can <i>afford</i> to replace/renovate their heating system or that there are sufficient tradespeople available to carry out works. Measures such as this should be combined with measures that improve feasibility such as subsidies, and measures to address bottlenecks such as skill scarcity. Additional considerations will need to be made on when the compliance deadline will be set and what the penalties for non-compliance will be.
Source (impacts):	As above.

Table 6-29 Energy poverty mediation

Name of the supporting measure:	Energy poverty mediation
Short description	Mediation Précarité Énergétique started as an experimental project as part of the SLIME programme (cf. Section 3.5.1) co-financed by the city of Lille (60-70%) and several other public or charitable organisations with a focus on housing (e.g., Conseil départemental du Nord, Fondation Abbé Pierre, Association Graal), that was formalized as a partnership agreement and implemented in the cities of Lille, Lomme and Hellemes between 2014 and 2018. The project had an overall budget of around EUR 370,000 (including engineering and operations).
Geographical scope	Lille – FR
Category/type of measure	Financing - grants/subsidies
Rationale	Providing subsidies to landlords to carry out works provides an incentive to improve energy efficiency in the property by lowering the upfront cost while increasing the value of the property.
Source	https://op.europa.eu/en/publication-detail/-/publication/a7aea3b3-350a-11ef-b441-01aa75ed71a1
Affected Stakeholder	Landlords, Tenants
Expected impacts	Effectiveness: By offering subsidies to landlords, the project effectively mitigated the reluctance to invest in energy efficiency, aligning the interests of both landlords and tenants. Benefits: Focused on the private rented sector, which often includes some of the most energy-inefficient housing. Cost (social and public): The overall project budget was approximately €370,000, with significant contributions from the City of Lille and other organizations. Landlords bore 50% of the renovation costs, incentivized by subsidies, while tenants benefited from reduced energy expenses without direct financial contributions. The project yielded social benefits,

Name of the supporting measure:	Energy poverty mediation
	including improved living conditions, health outcomes, and reduced energy poverty, outweighing the financial investments. Context: Lille's urban setting, with a significant proportion of private rentals, made it an ideal location for this targeted intervention. The collaborative approach among local authorities and organizations facilitated effective implementation. Scalability: The project's framework can be adapted to other urban areas with similar housing challenges, provided there is adequate funding and stakeholder collaboration. Scaling would necessitate additional financial resources and trained mediators to manage increased caseloads effectively. This type of project, requiring collaboration between different groups, lends itself more to the local scale. Speed of implementation: The project ran over a 4-year period, indicating that full implementation is a medium-term commitment Replicability: The mediation model is transferable to other municipalities facing energy poverty challenges, especially where private rentals are prevalent. Success depends on adapting the approach to local contexts and securing necessary funding. Effective replication requires strong partnerships between local authorities, housing organizations, and community groups, alongside tailored financial incentives to address specific regional needs.
Details affecting delivery	Delivery requires establishment of a mediation process and framework.
Source (impacts):	https://op.europa.eu/en/publication-detail/-/publication/a7aea3b3-350a-11ef-b441-01aa75ed71a1

Table 6-30 Subsidies for building renovation

Name of the supporting measure:	Subsidies for building renovation
Short description	Renovation of apartment buildings 2022-2030 (Estonia): This measure provides financial support for both the complete reconstruction of apartment buildings and, as an individual activity, the replacement of a heating device in the heating system of a gas, furnace or electric apartment building with a heating device using renewable energy sources, or the connection of these apartment buildings to a district heating network. Austrian Federal Government's Renovation Initiative (Austria): Funds are made available for subsidies for the enhancement of the thermal quality of residential buildings and the expansion of efficient heating systems, as well as for efficient new construction. The amount received is dependent on the achieved thermal quality and efficiency. MaPrimeRénov (France): MaPrimeRénov' (MPR) is a subsidy scheme to help households with energy efficient renovation of their dwelling. The scheme is accessible to all households, but energy-poor applicants obtain a higher level of support. Currently there are two versions of the scheme: • MPR "Decarbonisation": focusing on moving away from fossil fuel (e.g. heat pump installation)

Name of the supporting measure:	Subsidies for building renovation
	MPR "Accompanied": focusing on major renovation works with the mandatory assistance of an independent counsellor. Bonuses exist for the switch of fossil fuels equipment to a low carbon technology. Levels of subsidies depend on the revenue of the customer, Federal subsidy for efficient buildings (Bundesförderung für effiziente Gebäude (BEG)) (Germany): This funding scheme supports individuals, municipalities, companies, NGOs in improving energy efficiency of houses and buildings. From 2024, the measure consists in a base-subsidy of 30% for all homeowners, landlords, companies, non-profit organizations and municipalities, which replace old fossil heating systems. An additional subsidy of 30% is granted to households with a taxable household income of a maximum of 40.000€ annually. Additional subsidisation can be received (depending on the situation of the applicant), although the maximum subsidy is 70%. Eco-Fund (Slovenia): Eco-Fund (Slovenian Environmental Public Fund) is a Slovenian programme aimed at reducing energy poverty among most vulnerable citizens. Incentives for energy efficiency improvements can go up to €9,620 or €15,000 in the case the roof of the building is in bad condition. Beneficiaries can obtain such incentives for a number of energy-efficiency improvements, including the installation of heat pumps. Incentives come in the form of grants/subsidies and soft loans.
Geographic scope	EE, AT, FR, DE, SI
Category/type of measure	Financing - grants/subsidies, Financing - Soft loans/loans
Rationale	Subsidies offset high up-front costs, making renovations more affordable. Specific support for energy -poor applicants ensures those least able to afford works can achieve energy use reductions through the renovations.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5149 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/402 https://www.anah.gouv.fr/sites/default/files/2024-01/202401_ChiffresCles2023_WEBBA.pdf https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/projektion_en_2025-instrumentenpapier_korr_2.pdf https://zero500.ekosklad.si/kaj-je-program-zero500
Affected Stakeholder	Homeowners, Landlords, Tenants
Expected impacts	Effectiveness: Subsidies significantly reduce the financial burden on property owners, making renewable-ready heating systems more accessible. These programs can complement low-interest loans and tax incentives, enhancing overall support and reducing total cost of renovations. They also complement measures designed to increase uptake such as information measures and mandatory standards by making implementation based on these measures more affordable. Benefits: Programs target various sectors, including residential, commercial, and public buildings, aiming for widespread energy efficiency improvements. Depending on coverage the potential savings would be substantial. Improved energy efficiency can lead to reduced energy poverty and enhanced public health due to better living conditions.

Name of the supporting measure:	Subsidies for building renovation
	Estonia: It is expected that the cumulative savings are 0.183 PJ in 2030. Austria: It is expected that the cumulative savings are 7.9 PJ (2014-2020). France: Around 1.9 million renovations carried out under scheme 2020-2023, of which around 900,000 heating system installations. Germany: 72,200 ktCO₂ anticipated emission savings (2022-2040) Cost (social and public): For the most part, subsidies are government funded. While subsidies reduce initial expenses, property owners may still bear a portion of the costs; however, long-term energy savings can offset these investments. Targeted subsidies can reduce energy poverty, delivering social benefit. Estonia: €460million cumulative public budget (2022-2028) Austria: €381million cumulative public budget (2014-2020) France: €2billion per year public finance Germany: Total subsidy budget across 2021 and 2022 of €48billion. Context: Scalability: These programs are designed to be scalable, with frameworks that can be expanded to accommodate more applicants as additional funding becomes available. Scaling up requires increased financial resources and administrative capacity to manage a higher volume of applications. Speed of implementation: The speed of implementation varies by program, depending on administrative processes, public awareness, and the availability of contractors to perform the renovations. Typically, a call for applications for a subsidy can be put out with a fast turnaround, but it may take time for savings to be achieved. Replicability: These subsidy models can be adapted to other countries, provided there is political will, available funding, and a supportive policy framework. Successful replication depends on factors such as the existing condition of the building stock, economic conditions, and the capacity of the construction industry to meet increased demand. Subsidy measures are suitable for all other Member States, and the value and eligibility requirements of the subsidy can be set based on the national context.
Details affecting delivery	Value, eligibility requirements, and length of time the subsidy is available should all be considered based on the national context. For maximum efficacy, subsidies should be open over a long period to maximise public awareness and understanding of their financing options.
Source (impacts):	As above.

Table 6-31 Tax deductions for renewable heating systems

Name of the supporting measure:	Tax deductions for renewable heating systems
Short description	Homeowners can deduct 20 % of the costs from the installation of new renewable heating systems from their income tax (ESanMV 2020; §35c EStG 2009). 20 % of the expenses and at most, EUR 40,000 per residential property is tax deductible, spread over three years. (§35c, para. 1, EStG 2009). Addresses citizens paying taxes in Germany who renovate their own house. The deduction can be claimed for through the income tax declaration.

Name of the supporting measure:	Tax deductions for renewable heating systems
	Reduced VAT for buying and installing a heat pump applies in 15 EU MS. The amount of the reduction varies between 19% in Luxembourg and 75% in Greece. A VAT exemption for buying a heat pump applies in two Member States (Lithuania, Bulgaria) and Great Britain. Sometimes the HP has to fulfil certain requirements. In Romania the reduction is also applicable for solar thermal panels.
Geographical scope	DE LT, BG, AT, BE, CZ, EE, FR, EL, IE, IT, LV, LU, PL, PT, CY, RO, SI
Category/type of measure	Financing - Tax incentives
Rationale	Exemption from VAT, and/or relief on other tax via a tax credit for the installation of renewable-ready heating technologies offsets the high cost, reducing the financial burden on households
Source	https://clean-energy-islands.ec.europa.eu/countries/germany/legal/res-heating-and-cooling/tax-regulation-mechanism-support-energy-efficient https://www.ehpa.org/wp-content/uploads/2023/09/EHPA_VAT-on-heat-pumps-in-Europe-report_September-2023.pdf
Affected Stakeholder	Property owners
Expected impacts	Effectiveness: Tax incentives directly reduce the financial burden on homeowners, making renewable heating systems more accessible and attractive. Tax incentives complement other financial measures such as subsidies, bringing down the total cost of installing a renewable heating system. Benefits: By making renewable heating systems more affordable, these measures aim to significantly increase their penetration in the residential sector, thereby reducing reliance on fossil fuels. Widespread adoption of renewable heating systems can lead to substantial reductions in greenhouse gas emissions from the residential heating sector. Cost (social and public): The cost to the government is indirect, manifesting as reduced tax revenues due to deductions and lower VAT collections. As consumers benefit from reduced costs, manufacturers and installers may experience increased demand, potentially leading to economies of scale and reduced prices over time. The social benefits, including environmental improvements and the potential for reduced energy costs for households, could be expected to outweigh the loss in tax revenue. Context: Germany: With a significant portion of the population living in flats, tax deductions can incentivize individual homeowners and associations to invest in renewable heating systems. Other EU Countries: The effectiveness of VAT reductions depends on factors such as average income levels, existing heating infrastructure, and public awareness of renewable technologies. Scalability: These tax incentives can be scaled nationally and adapted by other countries, depending on fiscal capacity and policy priorities. Implementation requires adjustments to tax codes and effective communication strategies to inform eligible homeowners. Speed of implementation: Once legislated, tax incentives can be implemented relatively quickly, with homeowners able to benefit in the following tax year. Replicability: These measures are highly replicable, with adjustments to align with national tax systems and economic conditions. Success depends on factors such as public awareness, the simplicity of the application process, and the availability of qualified installers.

Name of the supporting measure:	Tax deductions for renewable heating systems
Details affecting delivery	<u>Income Tax Deductions (Germany):</u> Eligibility: Homeowners who renovate their own residences with renewable heating systems. Deduction Details: 20% of the installation costs, up to €40,000 per property, can be deducted from income tax over three years. Procedure: The deduction is claimed through the homeowner's income tax declaration. <u>VAT Reductions (Various EU Member States):</u> Scope: Reduced VAT rates apply to the purchase and/or installation of heat pumps, varying by country. Requirements: In some countries, the heat pump must meet specific criteria to qualify for the reduced VAT rate.
Source (impacts):	As above.

Table 6-32 Subsidies for building renovation

Name of the supporting measure:	Subsidies for building renovation
Short description	Renovation of apartment buildings 2022-2030 (Estonia): This measure provides financial support for both the complete reconstruction of apartment buildings and, as an individual activity, the replacement of a heating device in the heating system of a gas, furnace or electric apartment building with a heating device using renewable energy sources, or the connection of these apartment buildings to a district heating network. Austrian Federal Government's Renovation Initiative (Austria): Funds are made available for subsidies for the enhancement of the thermal quality of residential buildings and the expansion of efficient heating systems, as well as for efficient new construction. The amount received is dependent on the achieved thermal quality and efficiency. MaPrimeRénov (France): MaPrimeRénov' (MPR) is a subsidy scheme to help households with energy efficient renovation of their dwelling. The scheme is accessible to all households, but energy-poor applicants obtain a higher level of support. Currently there are two versions of the scheme: - MPR "Decarbonisation": focusing on moving away from fossil fuel (e.g. heat pump installation) - MPR "Accompanied": focusing on major renovation works with the mandatory assistance of an independent counsellor. Federal subsidy for efficient buildings (Bundesförderung für effiziente Gebäude (BEG)) (Germany): This funding scheme supports individuals, municipalities, companies, NGOs in improving energy efficiency of houses and buildings. From 2024, the measure consists in a base-subsidy of 30% for all homeowners, landlords, companies, non-profit organisations and municipalities, which replace old fossil heating systems. An additional subsidy of 30% is granted to households with a taxable household income of a maximum of 40.000€ annually. Additional subsidisation can be received (depending on the situation of the applicant), although the maximum subsidy is 70%. Eco-Fund (Slovenia):

Name of the supporting measure:	Subsidies for building renovation
	Eco Fund (Slovenian Environmental Public Fund) is a Slovenian programme aimed at reducing energy poverty among most vulnerable citizens. Incentives for energy efficiency improvements can go up to €9,620 or €15,000 in the case the roof of the building is in bad condition. Beneficiaries can obtain such incentives for a number of energy-efficiency improvements, including the installation of heat pumps. Incentives come in the form of grants/subsidies and soft loans.
Geographic scope	EE, AT, FR, DE, SI
Category/type of measure	Financing - Tax incentives
Rationale	Subsidies offset high up-front costs, making renovations more affordable. Specific support for energy -poor applicants ensures those least able to afford works can achieve energy use reductions through the renovations.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5149 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/402 https://www.anah.gouv.fr/sites/default/files/2024-01/202401_ChiffresCles2023_WEBBA.pdf https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/projektionen_2025-instrumentenpapier_korr_2.pdf https://zero500.ekosklad.si/kaj-je-program-zero500
Affected Stakeholder	Homeowners, Landlords, Tenants
Expected impacts	Effectiveness: Subsidies significantly reduce the financial burden on property owners, making renewable-ready heating systems more accessible. These programs can complement low-interest loans and tax incentives, enhancing overall support and reducing total cost of renovations. They also complement measures designed to increase uptake such as information measures and mandatory standards by making implementation based on these measures more affordable. Benefits: Programs target various sectors, including residential, commercial, and public buildings, aiming for widespread energy efficiency improvements. Depending on coverage the potential savings would be substantial. Improved energy efficiency can lead to reduced energy poverty and enhanced public health due to better living conditions. Estonia: It is expected that the cumulative savings are 0.183 PJ in 2030. Austria: It is expected that the cumulative savings are 7.9 PJ (2014-2020). France: Around 1.9 million renovations carried out under scheme 2020-2023, of which around 900,000 heating system installations. Germany: 72,200 ktCO₂ anticipated emission savings (2022-2040) Cost (social and public): For the most part, subsidies are government funded. While subsidies reduce initial expenses, property owners may still bear a portion of the costs; however, long-term energy savings can offset these investments. Targeted subsidies can reduce energy poverty, delivering social benefit. Estonia: €460million cumulative public budget (2022-2028) Austria: €381million cumulative public budget (2014-2020) France: €2billion per year public finance Germany: Total subsidy budget across 2021 and 2022 of €48billion.

Name of the supporting measure:	Subsidies for building renovation
	Context: Scalability: These programs are designed to be scalable, with frameworks that can be expanded to accommodate more applicants as additional funding becomes available. Scaling up requires increased financial resources and administrative capacity to manage a higher volume of applications. Speed of implementation: The speed of implementation varies by program, depending on administrative processes, public awareness, and the availability of contractors to perform the renovations. Typically, a call for applications for a subsidy can be put out with a fast turnaround, but it may take time for savings to be achieved. Replicability: These subsidy models can be adapted to other countries, provided there is political will, available funding, and a supportive policy framework. Successful replication depends on factors such as the existing condition of the building stock, economic conditions, and the capacity of the construction industry to meet increased demand. Subsidy measures are suitable for all other Member States, and the value and eligibility requirements of the subsidy can be set based on the national context.
Details affecting delivery	Value, eligibility requirements, and length of time the subsidy is available should all be considered based on the national context. For maximum efficacy, subsidies should be open over a long period to maximise public awareness and understanding of their financing options.
Source (impacts):	As above

Table 6-33 Reducing electricity prices

Name of the supporting measure:	Reducing electricity prices
Short description	Time-of-Use Tariffs for heat pumps (Germany): Historically, Germany offered time-of-use (ToU) tariff with reduced electricity rates during off-peak hours to promote heat pump adoption. Starting January 1, 2025, all electricity providers are mandated to offer dynamic tariffs reflecting real-time market prices, enabling consumers to optimise energy usage and costs. Reduced VAT on electricity used in heat pumps: Reduced VAT on electricity applies in some MS. In combination with a reduced VAT on heat pumps in BE, GR, IE, IT, LU. Not in combination with a reduced VAT on heat pumps: CR, MT, ES.
Geographical scope	DE, BE, GR, IE, LU, CR, MT, ES
Category/type of measure	Regulation & standards, Financing - Tax incentives
Rationale	Reducing electricity prices allows consumers to achieve cost savings by reducing running costs of their new heating system (particularly relative to the old system which likely ran on gas). Reduced VAT on electricity used by heat pumps (or potentially other technologies)

Name of the supporting measure:	Reducing electricity prices
	directly reduces electricity prices, therefore resulting in cost savings which reduce the time needed to pay off the investment. Time-of-use electricity tariffs help owners of heat pumps reduce energy costs by using cheaper off-peak electricity, often from renewables. This lowers both expenses and carbon emissions while helping to offset initial investment costs. Heat pump and electric heating system owners can maximise savings by increasing output when electricity is cheapest, providing an opportunity for cost savings. These savings should reduce the payback time.
Source	https://www.ffe.de/en/publications/series-of-articles-dynamic-electricity-tariffs-tariff-types-advantages-and-disadvantages-technical-requirements/ https://www.ehpa.org/wp-content/uploads/2023/09/EHPA_VAT-on-heat-pumps-in-Europe-report_September-2023.pdf
Affected Stakeholder	Homeowners and electricity billpayers, Energy suppliers
Expected impacts	Effectiveness: Dynamic tariffs enable consumers to take advantage of lower electricity prices during off-peak periods, reducing the operational costs of heat pumps. Reduced VAT rates decrease the overall expense of electricity consumption for heating purposes. These measures encourage consumers to shift energy usage to times when renewable energy supply is abundant and prices are lower, promoting grid stability and efficient energy use. Benefits: Only covers electricity-powered heating systems. Cost (social and public): Reduced VAT rates result in lower tax revenues, representing a fiscal investment in promoting renewable energy adoption. While upfront costs remain, operational savings from dynamic tariffs and reduced VAT can improve the economic feasibility of renewable heating systems over time. Context: The effectiveness of dynamic tariffs typically depends on the widespread availability and adoption of smart meters, which facilitate real-time pricing and consumption adjustments. Energy management Systems can also facilitate automatic adjustment of energy usage. Germany does not have significant rollout of smart meters however and used transitional methods to implement dynamic pricing in households regardless of the metering set up. One such option is through the use of apps that estimate based on your consumption (as entered based on the reading on the analogue meter). Scalability: These measures can be scaled across different regions, provided there is investment in necessary infrastructure like smart meters and supportive policy environments. The scalability depends on the readiness of energy markets to handle dynamic pricing models and the capacity of consumers to adapt to new pricing structures. Speed of implementation: Implementing dynamic tariffs requires time for regulatory changes, infrastructure upgrades, and consumer education. Once implemented, reduced VAT rates can provide immediate financial relief to consumers investing in renewable heating systems. Replicability: Other countries can adopt similar measures, tailoring them to local market conditions and regulatory frameworks to promote renewable heating technologies. The success of replicating dynamic tariffs depends on the existing technological infrastructure and the ability to deploy smart metering solutions.
Details affecting delivery	Consumers need smart meters or energy management systems to participate in dynamic pricing, enabling real-time data exchange between the consumer and the energy supplier.
Source (impacts):	https://ems.entega.de/faq-cockpit-app/

Table 6-34 Energy Audits (Advice) for Households (Austria)

Name of the supporting measure:	Energy Audits (Advice) for Households (Austria)
Short description	The energy advice bodies of the federal states offer energy advice to households by trained and independent auditors. This measure serves as an umbrella of multiple regional and local schemes, aiming to advise households on energy savings.
Geographical scope	AT
Category/type of measure	Awareness, technical support and training
Rationale	The state providing free energy audits removes financial barriers to learning about possible energy savings and the means by which they might be achieved. As a result, information on how to reduce energy consumption is easier to come by.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4378
Affected Stakeholder	Property owners
Expected impacts	Effectiveness: By providing independent, expert advice, it directly improves awareness and trust in renewable-ready heating technologies. Households that receive audits are more likely to invest in energy efficiency and renewable heating due to clarity on costs, savings, and available subsidies. Complements subsidy programs for renewable-ready heating and works alongside mandatory energy efficiency measures by guiding homeowners on compliance and funding opportunities. Benefits: Covers a wide range of building types, from individual homes to larger multi-apartment buildings, making it one of the most comprehensive awareness-raising measures. By driving heat pump adoption and energy efficiency improvements, it reduces fossil fuel dependency in heating. Energy savings of 1.75 PJ and GHG emission savings of 65 ktCO₂ were achieved between 1990 and 2015. Cost (social and public): Funded regionally and nationally, though budgets are not standardized across all federal states. Energy audits are free or heavily subsidized, ensuring broad accessibility. Consumers still bear the cost of renovations, but audits help optimize spending by identifying the most effective measures. Positive impact on lower-income households by ensuring they are aware of available subsidies, preventing exclusion from the energy transition. Context: Austria's building stock is aging, with around 58% of dwellings built before 1981. Scalability: The modular, region-led model allows it to expand as funding increases. However, the measure requires ongoing training and certification of auditors. Speed of implementation: Can be sped up via use of digital consultations. A shortage of trained auditors could prove to be a bottleneck. Limited awareness may also slow uptake. Replicability: Highly replicable, as similar advisory services already exist in many EU countries. Could be adapted to different building stock conditions. Countries with an aging building stock represent the best fit for this measure. In countries with a skills shortage, shortage of trained energy auditors may prove a particularly significant barrier.
Details affecting delivery	None

Name of the supporting measure:	Energy Audits (Advice) for Households (Austria)
Source (impacts):	https://www.statistik.at/en/statistics/population-and-society/housing/stock-of-dwellings https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4378

Table 6-35 Information about heat pumps

Name of the supporting measure:	Information about heat pumps
Short description	Heat pumps for detached and terraced houses (Finland): In addition to financial support via subsidies and tax credits, information dissemination has been in important role in the deployment of heat pumps in Finland. The promotion of heat pumps is part of the continuous promotion work undertaken by Motiva in partnership with other actors in the field with the aim of improving the energy performance of small residential buildings and promoting the use of renewable energy sources. Digital platform (Netherlands): The digital platform (Duurzaam Bouwloket) answers questions in the field of sustainable construction, renovation, energy savings, energy generation, heating systems, and financing. The service provides guidance on steps to take to improve personal sustainability, tailored advice on required improvements and how to find installers, loans and advisors. Videos and digital assessment tools are also provided to facilitate DIY improvements.
Geographical scope	FI, NL
Category/type of measure	Awareness, technical support and training
Rationale	(FI) Information campaigns can dispel myths about inadequacy of heat pumps in cold weather, in addition, financial support may encourage even those who remain sceptical to adopt the more energy efficient heating system option. (NL) Availability of an online web-tool to provide information on heat pumps, as well as help homeowners identify whether their property is suitable for a heat pump, and if so, which type makes it easier to bridge the gap between people who are curious about installing a heat pump and people actually installing them. Furthermore, by making it easy to find out which heat pump is suitable makes it more likely people will be satisfied with the heat pump they did install, which should improve heat pumps' reputation.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/588 https://www.verbeterjehuis.nl/tips-en-inspiratie/een-warmtepomp-past-in-vrijwel-elk-huis https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4010 https://www.verbeterjehuis.nl/
Affected Stakeholder	Homeowners
Expected impacts	Effectiveness: Comprehensive information campaigns and platforms increase public knowledge about heat pumps, leading to higher adoption rates. Collaboration with reputable organisations and provision of impartial advice enhance consumer confidence in heat pump technology.

Name of the supporting measure:	Information about heat pumps
	Information dissemination complements subsidies and tax credits, guiding homeowners on how to benefit from financial support for installations of renewable heating systems. Benefits: Measures could be expanded to include other renewable-based/renewable-ready heating technologies. The Digital Platform in the Netherlands is not technology specific, covering a variety of energy efficiency and low carbon options. Both campaigns are nationwide. Cost (social and public): Both are entirely publicly funded. Free access to information lowers the barrier for homeowners considering heat pumps, allowing them to find information without paying for an audit. Costs are minimal given the reach. Context: Given its cold climate, information measures about heat pumps (which suffer from misinformation about their cold-weather efficacy) are particularly important in Finland. Scalability: Information dissemination is easily scalable through digital platforms, workshops, and collaborations with local governments. Speed of implementation: Information campaigns can be launched relatively quickly, with digital platforms being developed and updated within months. However, there is no guarantee that actions taken in light of the information will occur quickly. Replicability: Similar information dissemination strategies can be adopted by other countries aiming to promote adoption of heat pumps and other renewable-based or renewable-ready heating technologies. These measures will likely be most impactful in countries with high levels of heating demand. Content will need to be adapted to align with local needs, based on style of communication, languages, and the characteristics of the building stock.
Details affecting delivery	None
Source (impacts):	As above.

6.4 BUILDINGS – ENERGY DEMAND

This subsection contains the expanded measures from the long list of measures, in table format for buildings – Energy demand.

Table 6-36 Brussels - Interest-Free Loans for Energy Efficiency Investments [ECORENO]

Name of the supporting measure:	Brussels - Interest-Free Loans for Energy Efficiency Investments [ECORENO]
Short description	This measure provides interest-free loans to Brussels households to finance energy efficiency improvements. The programme started in 2007 and is currently ongoing. The programme covers work such as insulation, ventilation, and high-performance heating systems. The goal is to promote energy efficiency while addressing the financial barriers faced by low-income households. Personalised assistance is provided to ensure the successful application of funds, and the measure complements regional goals under the Air-Climate-Energy Plan.

Name of the supporting measure:	Brussels - Interest-Free Loans for Energy Efficiency Investments [ECORENO]
Geographical scope	Brussels - BE
Category/type of measure	Financing - Soft loans/loans
Rationale	Provision of interest-free loans means that long payback periods are less of an issue for two reasons. Firstly, less of the initial cost comes out of the household's own funds, and secondly, the fact that the loans are interest-free ensures that the total cost to the household isn't increasing over time, further increasing the time required to pay back the initial cost.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/425 Le crédit Ecoreno Citoyen - Bruxelles Environnement
Affected Stakeholder	Homeowners, Landlords, Tenants
Expected impacts	Effectiveness: Improves financial feasibility, allowing homeowners to benefit from lower energy bills without upfront costs, as well as making the total cost known from the start. Benefits: Focuses only on residential properties. Cost (social and public): The subsidy is funded by the Brussels local authority. Consumers pay only the principal on the loan, no interest. By improving efficiency, the billpayer pays a lower energy bill. Involves a component addressing energy poverty. Context: Brussels has a mix of old and new housing, with many older buildings requiring retrofitting. Ecoreno is particularly useful for lower-income households that may not otherwise afford energy renovations. Scalability: Could scale to include more types of properties (e.g., rental buildings) or integrate additional incentives to increase impact. Speed of implementation: Requires administrative infrastructure for loan processing and allocation. If integrated with existing energy efficiency programs, implementation could be relatively quick. Replicability: Can be replicated in urban areas with high renovation needs and low renovation rates due to financial concerns. Ideal for regions with aging housing stock and low-income homeowners who struggle with financing renovations.
Details affecting delivery	Loan Accessibility – Low- and middle-income households are prioritised, and eligibility is based on income levels. Loan Terms – Zero-interest or low-interest loans extend payback periods, easing financial strain. Renovation Coverage – Supports various energy-efficient upgrades, including insulation, heating, and solar panels.
Source (impacts):	https://fonds.brussels/en/borrowing/ecoreno-credit

Table 6-37 On-bill-financing

Name of the supporting measure:	On-bill-financing
Short description	Energiesprong (NL, FR, IT, GB): Energiesprong is an initiative under which home renovations are carried out such that a home generates all the energy it requires. Prefabricated materials are used, allowing the renovations to be delivered at pace, with full renovations possible in less than ten days. The initiative began in the Netherlands but has since expanded to other countries, including France, Italy, and the United Kingdom. Generally, these renovations are funded by the money saved on the energy bill over the coming 30 years, with recipients paying a monthly fee equivalent to the difference between their current and previous energy bills. This means that these measures are effectively zero cost as the costs are compensated by the savings, although implementation in this way would run counter to the idea that energy efficiency improvements always result in lower energy bills. As an additional advantage, delivery of retrofit deals using standardised components on a wide scale delivers economies of scale, meaning renovations can be delivered at a lower cost than might otherwise be the case. Green Deal (GB): Businesses and individuals can access financing to carry out energy efficiency renovations recommended for their building by approved Green Deal Assessors. One of the possible options to pay for these renovations is through on-bill financing. Loans are repaid through charges added to the electricity bill, the loan is associated with the property to be paid by the person who pays the electricity bill for the property. The annual repayments on the loan should not exceed the savings on the energy bill.
Geographical scope	FR, IT, NL, GB
Category/type of measure	Financing - Soft loans/loans
Rationale	Recipients may pay effectively nothing for the renovations depending on the repayment rate on the on-bill financing scheme, as payments come out of the existing energy bill, and typically only out of the savings achieved. Due to this, long payback periods are less of an issue, as the homeowner is not financially burdened. Tying the loan to the property rather than the individual also mitigate an issue of long payback periods: that it may not seem worthwhile to carry out renovations in case of move house.
Source	https://energiesprong.org/ https://www.gov.uk/green-deal-energy-saving-measures/how-to-pay
Affected Stakeholder	Homeowners, Landlords, Tenants, Energy companies
Expected impacts	Effectiveness: Improves financial attractiveness of renovations. Can be combined with grants or subsidies to further reduce costs and encourage comprehensive energy efficiency improvements. Benefits: Applicable to both residential and commercial properties, facilitating widespread adoption of energy efficiency measures. Cost (social and public): Public Financial Contribution varies by programme; some initiatives are government-funded, while others rely on private capital. Participants repay the financing through their utility bills, ideally offset by energy savings, minimising financial strain.

Name of the supporting measure:	On-bill-financing
	Potential concerns include ensuring equitable access and preventing disproportionate impacts on low-income households. Context: Scalability: Energiesprong's prefabricated materials make it scalable on a wide scale. Challenge may be in finding public capital or private investors – one reason these schemes are not already widespread is that the loans are not an attractive investment. Speed of implementation: Implementation speed can vary; programs leveraging existing utility infrastructure and standardised renovation processes, such as Energiesprong, may achieve faster deployment. Replicability: Replicability depends on whether financing can be sourced. It also requires participation of energy companies, so a regulatory environment that supports this may help.
Details affecting delivery	Energy Supplier Involvement – Requires energy providers to facilitate financing and collect repayments, which may necessitate regulatory frameworks and agreements. Loan Structure & Repayment – The loan is tied to the property rather than an individual, meaning repayments continue with new occupants or owners. Cost Neutrality – Designed so that loan repayments do not exceed energy savings, making it financially viable. Pre-Assessment Requirements – Requires a home energy assessment to determine eligible upgrades. Prefabrication & Efficiency Gains (Energiesprong) – The use of standardised components and prefabricated materials improves cost-effectiveness and installation speed.
Source (impacts):	Internal Expert

Table 6-38 Subsidies for building renovation

Name of the supporting measure:	Subsidies for building renovation
Short description	Renovation of apartment buildings 2022-2030 (Estonia): This measure provides financial support for both the complete reconstruction of apartment buildings and, as an individual activity, the replacement of a heating device in the heating system of a gas, furnace or electric apartment building with a heating device using renewable energy sources, or the connection of these apartment buildings to a district heating network. Austrian Federal Government's Renovation Initiative (Austria): Funds are made available for subsidies for the enhancement of the thermal quality of residential buildings and the expansion of efficient heating systems, as well as for efficient new construction. The amount received is dependent on the achieved thermal quality and efficiency. MaPrimeRénov (France): MaPrimeRénov' (MPR) is a subsidy scheme to help households with energy efficient renovation of their dwelling. The scheme is accessible to all households, but energy-poor applicants obtain a higher level of support. Currently there are two versions of the scheme: - MPR "Decarbonisation": focusing on moving away from fossil fuel (e.g. heat pump installation)

Name of the supporting measure:	Subsidies for building renovation
	- MPR "Accompanied": focusing on major renovation works with the mandatory assistance of an independent counsellor. Federal subsidy for efficient buildings (Bundesförderung für effiziente Gebäude (BEG)) (Germany): This funding scheme supports individuals, municipalities, companies, NGOs in improving energy efficiency of houses and buildings. From 2024, the measure consists in a base-subsidy of 30% for all homeowners, landlords, companies, non-profit organisations and municipalities, which replace old fossil heating systems. An additional subsidy of 30% is granted to households with a taxable household income of a maximum of 40.000€ annually. Additional subsidisation can be received (depending on the situation of the applicant), although the maximum subsidy is 70%. Eco-Fund (Slovenia): Eco Fund (Slovenian Environmental Public Fund) is a Slovenian programme aimed at reducing energy poverty among most vulnerable citizens. Incentives for energy efficiency improvements can go up to €9,620 or €15,000 in the case the roof of the building is in bad condition. Beneficiaries can obtain such incentives for a number of energy-efficiency improvements, including the installation of heat pumps. Incentives come in the form of grants/subsidies and soft loans.
Geographical scope	EE, AT, FR, DE, SI
Category/type of measure	Financing - grants/subsidies, Financing - Soft loans/loans
Rationale	Subsidies offset high up-front costs, making renovations more affordable. Specific support for energy-poor applicants ensures those least able to afford works can achieve energy use reductions through the renovations.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5149 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/402 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4203 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/3992 https://zero500.ekosklad.si/kaj-je-program-zero500
Affected Stakeholder	Homeowners, Landlords, Tenants
Expected impacts	Effectiveness: Subsidies significantly reduce the financial burden on property owners, making renewable-ready heating systems more accessible. These programs can complement low-interest loans and tax incentives, enhancing overall support and reducing total cost of renovations. They also complement measures designed to increase uptake such as information measures and mandatory standards by making implementation based on these measures more affordable. Benefits: Programs target various sectors, including residential, commercial, and public buildings, aiming for widespread energy efficiency improvements. Depending on coverage the potential savings would be substantial. Improved energy efficiency can lead to reduced energy poverty and enhanced public health due to better living conditions. Estonia: It is expected that the cumulative savings are 0.183 PJ in 2030.

Name of the supporting measure:	Subsidies for building renovation
	Austria: It is expected that the cumulative savings are 7.9 PJ (2014-2020). France: Around 1.9 million renovations carried out under scheme 2020-2023, of which around 900,000 heating system installations. Germany: 72,200 ktCO₂ anticipated emission savings (2022-2040) Cost (social and public): For the most part, subsidies are government funded. While subsidies reduce initial expenses, property owners may still bear a portion of the costs; however, long-term energy savings can offset these investments. Targeted subsidies can reduce energy poverty, delivering social benefit. Estonia: €460million cumulative public budget (2022-2028) Austria: €381million cumulative public budget (2014-2020) France: €2billion per year public finance Germany: Total subsidy budget across 2021 and 2022 of €48billion. Context: Scalability: These programs are designed to be scalable, with frameworks that can be expanded to accommodate more applicants as additional funding becomes available. Scaling up requires increased financial resources and administrative capacity to manage a higher volume of applications. Speed of implementation: The speed of implementation varies by program, depending on administrative processes, public awareness, and the availability of contractors to perform the renovations. Typically, a call for applications for a subsidy can be put out with a fast turnaround, but it may take time for savings to be achieved. Replicability: These subsidy models can be adapted to other countries, provided there is political will, available funding, and a supportive policy framework. Successful replication depends on factors such as the existing condition of the building stock, economic conditions, and the capacity of the construction industry to meet increased demand. Subsidy measures are suitable for all other Member States, and the value and eligibility requirements of the subsidy can be set based on the national context.
Details affecting delivery	Value, eligibility requirements, and length of time the subsidy is available should all be considered based on the national context. For maximum efficacy, subsidies should be open over a long period to maximise public awareness and understanding of their financing options.
Source (impacts):	As above.

Table 6-39 Tax deductions for energy efficiency renovations

Name of the supporting measure:	Tax deductions for energy efficiency renovations
Short description	Reduced VAT for energy renovations in the residential sector (Cyprus): Energy efficiency renovations of private residences are subject to a VAT rate of 5% rather than the usual 19% VAT rate. Thermo-modernisation tax relief (Poland): The full value of energy efficiency renovations (up to PLN 53,000), including related costs such as energy audits, is deductible from taxable income for the purposes of calculating income tax in single-family residential buildings.

Name of the supporting measure:	Tax deductions for energy efficiency renovations
	Reduced VAT rate on labour costs for insulation and glass and for maintenance and renovation of residential buildings (Verlaagd BTW tarief) (Netherlands): The labour component of the cost of energy efficiency renovations on residential buildings over 2 years old has a VAT rate reduction from 19% to 6%. Tax Credits for Small Scale Landlords to Retrofit Rental Houses (Ireland): Small-scale landlord can deduct up to €10k from their rental income for the purposes of determining tax if they retrofit their property while a tenant remains in the property. Household tax credit (Finland): Homeowners are eligible for a tax credit covering labour costs associated with replacing, upgrading, and repairing heating systems in small residential houses, as well as other energy efficiency improvements. The rate of the deduction varies by recipient and the specific work done. Tax incentives for energy-efficient home renovation (Luxembourg): To encourage energy-efficient renovations, rental properties that qualify for financial aid under the "Klimabonus Wunnen" program can benefit from a 6% depreciation rate for 10 years on sustainable energy upgrades. Additionally, all renovation work—including but not limited to energy improvements—can take advantage of a special reduced VAT rate of 3%, up to a certain limit.
Geographical scope	CY, PL, NL, IE, FI, LU
Category/type of measure	Financing - Tax incentives
Rationale	Exemption from VAT, and/or relief on other tax via a tax credit for energy efficiency renovations offsets the high cost, reducing the financial burden on households and businesses.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/466 https://www.podatki.gov.pl/pit/ulgi-odliczenia-i-zwolnienia/ulga-termomodernizacyjna/ https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/842 Minister Donohoe announces a new tax incentive to encourage small-scale landlords to undertake retrofitting works https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/582 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4777
Affected Stakeholder	Homeowners, Landlords
Expected impacts	Effectiveness: Tax deductions lower the effective cost of energy efficiency renovations, making them more financially accessible to property owners. Combining tax deductions with subsidies or low-interest loans can further alleviate financial burdens. Using informational measures to inform the public of incentives available can increase uptake. Benefits: Measures cover a wide range of energy efficiency improvements. Thermo-modernisation tax relief (Poland): 24.8 PJ by 2030

Name of the supporting measure:	Tax deductions for energy efficiency renovations
	Tax incentives for energy-efficient home renovation (Luxembourg): 0.7 PJ by 2030. Cost (social and public): Consumers must still cover renovation costs upfront before claiming deductions, which can limit access for lower-income households. In addition, tax-based incentives primarily benefit those with taxable income, potentially excluding non-taxpaying low-income groups. Context: Scalability: Tax deduction schemes can be implemented on a national scale, with adjustments to reflect different income levels, building stock characteristics, and government budgets. As tax deductions are processed via existing tax systems, they do not require large-scale administrative infrastructure. Speed of implementation: Tax deductions can be introduced within one fiscal year via adjustments to tax codes and require minimal infrastructure. Replicability: Tax incentives are a widely used mechanism in various sectors and can be adapted to local fiscal policies. Countries with an aging building stock and a high percentage of homeownership will benefit the most from these measures.
Details affecting delivery	The level of deductions available, which renovations are applicable, how to apply, and whether the deductions affect VAT or income tax will need to be considered.
Source (impacts):	As above.

Table 6-40 Energy-Linked Rental Price Regulation

Name of the supporting measure:	Energy-Linked Rental Price Regulation
Short description	Home valuation system (WWS) (Netherlands): The WWS is a system for determining the maximum rental price for a rental property. The more points a home is worth, the higher the rent may be. The Netherlands updated this system to award additional points for energy efficiency of properties, allowing landlords to increase rent on efficient properties, which is offset for the tenant by the reduced energy bills. Energy Performance Fees (Netherlands): Under the Energy Performance Fee Bill (EPV), Landlords who renovate their properties so they are zero-energy (or nearly), or "zero-on-the-meter" homes can request an energy performance fee from their tenants to recoup the substantial investments made in the rental property. Civil Law 559 (Germany): Property owners who carry out energy efficiency renovations on a rented property can increase the annual rent by 8% of the renovation costs. However, the monthly basic rent cannot rise by more than €3 per m², or €2 per m² if the basic rent is below €7 per m². Rental Price Indexation Prohibition (Belgium): This policy introduced a temporary halt to the indexation of rental price, which is the periodic adjustment of the rent to reflect changes in the cost of living. Under this regulation, landlords renting a property with an energy performance certificate (EPB) equal to E, F, or G could no

Name of the supporting measure:	Energy-Linked Rental Price Regulation
	longer use indexation to increase the rent. After November 2023, indexation for rental properties with low EPB is allowed, but using an adapted formula.
Geographic scope	NL, DE, BE
Category/type of measure	Regulation & standards
Rationale	Application of these measures addresses the split incentive issue on the side of the landlords. By limiting the rent that can be charged based on energy efficiency, landlords are forced to carry out renovations on inefficient properties in order to charge higher rents, while (typically) tenants living in these properties will at least not need to pay both high energy bills and high rent. The energy performance fee likewise provides an incentive to renovate, allowing collection of an additional fee for zero-energy homes. Tenants are not negatively impacted as they do not need to pay energy bills in these homes. Germany's civil law 559 addresses the split incentive issue by a similar mechanism, as does Belgium's Rental price indexation prohibition measure. The former allows a fixed rent increase based on the level of energy efficiency improvements implemented and the latter limits rent increases on properties that do not meet energy performance requirements.
Source	Netherlands NECP 2023 (Annex 3) (https://commission.europa.eu/system/files/2023-07/Annex%203-%20Netherlands%20Draft%20update%20NECP%202021-2030_0.pdf) https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4962 Energy Performance Fee (EPV) RVO.nl https://link.springer.com/article/10.1007/s12053-023-10102-y#:~:text=Furthermore%2C%20according%20to%20Germany's%20Civil,than%203%20%E2%82%AC/m2/ https://be.brussels/en/housing/rental/lease-contracts/rental-price-indexation
Affected Stakeholder	Landlords, Tenants
Expected impacts	Effectiveness: Tenants are encouraged to seek energy-efficient homes, fostering a market preference that pressures landlords to upgrade properties. Combining rental regulations with subsidies or tax incentives can further reduce the financial burden on landlords. Benefits: Measures cover the whole of the rental market. Cost (social and public): These regulatory measures primarily involve policy changes rather than direct public expenditure. Landlords bear the upfront costs of renovations but can recuperate investments through regulated rent increases. Tenants may experience higher rents; however, these are often offset by lower energy bills, leading to potential net savings. Ensuring that rent increases do not disproportionately affect low-income tenants is crucial. Measures such as caps on rent hikes or targeted subsidies may be necessary. Context: The Netherlands has a significant proportion of housing as rental housing, making rental regulations more impactful. Belgium's rental regulations differ by region; in other member states replicating a measure like this may require broader approval and harmonisation between local and state law. Scalability: It might not be possible to scale these measures beyond the current scope given they are specifically tailored to the rental market. Speed of implementation: Policy development and stakeholder consultations could take a long time, particularly as this may prove politically contentious. However, once developed,

Name of the supporting measure:	Energy-Linked Rental Price Regulation
	the measure would be able to have immediate effect, as landlords may be keen to protect their income. Replicability: Measures would be replicable across other Member States but could prove contentious and may require extensive stakeholder consultations. Measures likely to have the most impact in Member States with a large share of renters.
Details affecting delivery	Regulatory Framework: Establishes guidelines on permissible rent adjustments linked to energy efficiency improvements, ensuring transparency and fairness. Energy Performance Assessment: Requires standardised evaluations to determine the property's energy efficiency before and after renovations. Tenant-Landlord Agreements: Mandate clear communication and agreements outlining the scope of renovations, expected benefits, and corresponding rent adjustments.
Source (impacts):	Internal expert.

Table 6-41 Minimum energy performance requirements for new and existing buildings

Name of the supporting measure:	Minimum energy performance requirements for new and existing buildings
Short description	A large variety of standards are in place across Europe, the following are examples of such. Minimum energy performance requirements for new and existing buildings (Cyprus): All new and existing buildings, with some exceptions must satisfy minimum energy performance requirements. Rules on efficient use of energy in buildings 2022 (Slovenia): This Regulation specifies the technical requirements for the construction of almost zero energy buildings, which must be met in order to achieve the energy efficiency of buildings in the field of properties of the building's thermal envelope, technical building systems (TSS), heating, cooling, air conditioning, ventilation or their combination, preparation of hot sanitary water (TSV), lighting, automation and control of TSS, provision of own renewable energy sources (RES) including on-site electricity production, provision of e-mobility support for the needs of building users.
Geographical scope	CY, SI
Category/type of measure	Regulation & standards
Rationale	Mandatory standards overcome the lack of incentive by ensuring that there is not an option available to build energy inefficient properties, or for the least efficient properties to remain as they are.
Source	Cyprus - Final updated NECP 2021-2030 (submitted in 2024) https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/960

Name of the supporting measure:	Minimum energy performance requirements for new and existing buildings
Affected Stakeholder	Property owners, Construction industry
Expected impacts	Effectiveness: By setting legal requirements, property owners are compelled to invest in energy efficiency, overcoming the reluctance due to split incentives. Establishing minimum standards shifts the entire market toward higher energy performance, benefiting all occupants. Combining mandatory requirements with financial incentives such as tax deductions or subsidies make carrying out mandated improvements more financially viable for property owners. Benefits: Cyprus' mandatory standards apply to <i>all</i> buildings (with some exceptions). Cost (social and public): Public costs involve only those associated with developing the regulation. Property owners may face increased expenses in order to carry out works, which may be passed on to tenants through rent increases. These rent increases <i>should</i> be offset by lower energy bills. Steps need to be taken to ensure the mandatory upgrades do not disproportionately impact low-income tenants to avoid social costs. Context: Scalability: Minimum energy performance requirements can be implemented nationally and adapted to regional contexts. Property owners may need support to manage the costs of necessary upgrades. Speed of implementation: Developing and implementing regulations, along with allowing time for stakeholders to comply, can take a long time. Furthermore, property owners may resist due to the cost implications. Replicability: Regulatory measures like these can be adapted to various national and regional contexts, considering local building characteristics and climates. However, effective enforcement requires well-developed regulatory frameworks and resources Countries with high proportion of rental properties are likely to have the greatest impact from these measures.
Details affecting delivery	Many Member States already have standards in place. Savings would require <i>additional</i> or <i>more stringent</i> standards to be put in place, as was the case in Slovenia's measure.
Source (impacts):	Internal expert.

Table 6-42 Tax deductions for renewable heating systems

Name of the supporting measure:	Energy Audits (Advice) for Households (Austria)
Short description	The energy advice bodies of the federal states offer energy advice to households by trained and independent auditors. This measure serves as an umbrella of multiple regional and local schemes, aiming to advise households on energy savings.
Geographical scope	AT
Category/type of measure	Awareness, technical support and training
Rationale	The state providing free energy audits removes financial barriers to learning about possible energy savings and the means by which they might be achieved.

Name of the supporting measure:	Energy Audits (Advice) for Households (Austria)
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4378
Affected Stakeholder	Property owners
Expected impacts	Effectiveness: By providing independent, expert advice, it directly improves awareness of savings achievable through energy efficiency renovations. Households that receive audits are more likely to invest in energy efficiency due to clarity on costs, savings, and available subsidies. Complements subsidy programs for energy efficiency renovations and works alongside mandatory energy efficiency measures by guiding homeowners on compliance and funding opportunities. Benefits: Covers a wide range of building types, from individual homes to larger multi-apartment buildings, making it one of the most comprehensive awareness-raising measures. By driving energy efficiency improvements, it reduces fossil fuel dependency. Energy savings of 1.75 PJ and GHG emission savings of 65 ktCO₂ were achieved between 1990 and 2015. Cost (social and public): Funded regionally and nationally, though budgets are not standardized across all federal states. Energy audits are free or heavily subsidized, ensuring broad accessibility. Consumers still bear the cost of renovations, but audits help optimize spending by identifying the most effective measures. Positive impact on lower-income households by ensuring they are aware of available subsidies, preventing exclusion from the energy transition. Context: Austria's building stock is aging, with around 58% of dwellings built before 1981. Scalability: The modular, region-led model allows it to expand as funding increases. However, the measure requires ongoing training and certification of auditors. Speed of implementation: Can be sped up via use of digital consultations. A shortage of trained auditors could prove to be a bottleneck. Limited awareness may also slow uptake. Replicability: Highly replicable, as similar advisory services already exist in many EU countries. Could be adapted to different building stock conditions. Countries with an aging building stock represent the best fit for this measure. In countries with a skills shortage, shortage of trained energy auditors may prove a particularly significant barrier.
Details affecting delivery	None
Source (impacts):	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4378

Table 6-43 Energy efficiency web tool

Name of the supporting measure:	Energy efficiency web tool
Short description	Federal government - EnergyWatchers Web Tool (Belgium): This measure provides a web tool that can be used by households to calculate CO₂ emissions and energy costs for appliances, buildings, and cars. It provides tailored advice for replacement, better use, or optimal new product selection, factoring in subsidies, personal behaviour, and regional specifics.

Name of the supporting measure:	Energy efficiency web tool
	IDEA e-Learning platform (Spain): The IDAE e-Learning platform provides online courses (taking 1-6 hours to complete) on energy savings at home, in the workplace and while driving. Multimedia resources are provided to give an interactive learning experience. Free guides and documentation can also be downloaded for each course. The courses are aimed at reducing energy consumption through behavioural change, as well as providing information required to carry out renovations. Digital platform (Netherlands): The digital platform (Duurzaam Bouwloket) answers questions in the field of sustainable construction, renovation, energy savings, energy generation, heating systems, and financing. The service provides guidance on steps to take to improve personal sustainability, tailored advice on required improvements and how to find installers, loans and advisors. Videos and digital assessment tools are also provided to facilitate DIY improvements.
Geographical scope	BE, ES, NL
Category/type of measure	Awareness, technical support and training
Rationale	Tailored advice on a household's specific energy use allows targeted reductions in the most excessive areas of consumption. Generalised information and tools enable savings among a wide range of people with the knowledge to reduce personal energy use, obtain or perform renovations.
Source	Dakisolatie - EnergyWatchers Home Plataforma para el ciudadano https://www.verbeterjehuis.nl/ https://www.valuecoders.com/blog/technology-and-apps/a-complete-timeline-guide-for-web-app-development/
Affected Stakeholder	Consumers
Expected impacts	Effectiveness: These platforms provide accessible information, helping users understand the benefits and potential savings from energy efficiency renovations. By offering tailored advice and educational resources, users are more likely to adopt energy-efficient practices and consider renovations. These tools should be combined with subsidies or tax incentives, to guide users on how to maximise financial benefits from energy efficiency measures. Benefits: Measures have the potential to reach the whole residential sector. Cost (social and public): Initial funding is required to develop these platforms, with ongoing costs for updates and maintenance. Access to these platforms is typically free for users, reducing financial barriers to information. Individuals without access to digital internet-connected devices will not be able to access these platforms. Context: Scalability: These digital platforms can be expanded to include more features, languages, and regions, increasing their reach and impact. Maintaining user interest and ensuring the information leads to actionable outcomes can be challenging.

Name of the supporting measure:	Energy efficiency web tool
	Speed of implementation: Developing a comprehensive web tool requires time for planning, development, testing, and deployment. The whole process can take 2-12 months or even longer, depending on complexity and available content. Replicability: The concept of energy efficiency web tools is adaptable and can be implemented in various countries and regions. Demographics with low digital literacy may need additional support to make the most of the tool.
Details affecting delivery	None
Source (impacts):	As above.

Table 6-44 Energy efficiency information programmes

Name of the supporting measure:	Energy efficiency information programmes
Short description	Information Programme "Let's Live Warmer" (Latvia) In Latvia the programme motivates for building energy efficient renovation. Wide scope of methods is applied to reach and to inform and consult societies of the flats' owners (housing associations) regarding conditions and benefits of energy efficiency increase and the best practices of it, available financial support. Programme consults also on the good practice of maintaining the apartment building after renovation. Information campaign on raising awareness about energy efficiency (Czech Republic) The measure, managed by the Ministry of Industry and Trade, aims to raise awareness of energy efficiency with a view to changing the behaviour of energy consumers and reducing energy consumption. The national information campaign will be multilevel in order to maximise the impact on energy consumers. Information activities will be realised through TV spots, information activities in print media, information activities on social networks and, last but not least, through an Internet platform. Energy advice network for citizens – ENSVET (Slovenia) Energy advice network for citizens -ENSVET is the main programme for advising (informing and assisting the citizens (local residents) in the implementation of energy efficiency measures in households and the expansion of consulting for companies in 2027. The consulting and assistance regarding the energy efficiency measures is very important and free of charge for all owners of houses, who want to invest in energy efficiency measures. The consulting offices advise in the following cases: selection of heating systems and heating devices, exchange of the old heating device and heating, decrease of fuel consumption, selection of suitable fuels, insulation of buildings, selection of suitable windows, sanitation of buildings with the purpose to reduce energy consumption, using energy efficient households' appliances, in all other questions about the energy use in households. ADEME energy-saving awareness campaign (France)

Name of the supporting measure:	Energy efficiency information programmes
	The objective of this operation carried out by ADEME and supported by Ministries is to sensitize and mobilise the public audience about energy management and climate change in order to incite them to act daily to make energy savings. The logic has been to find partners in order to constitute networks in capacity to diffuse efficiently messages and information towards different types of targeted public. A campaign was released across all media platforms with a slogan and a "club of partners" was created to improve public awareness of climate change by communication, training, exhibitions etc.
Geographical scope	LV, CZ, SI, FR
Category/type of measure	Awareness, technical support and training
Rationale	Providing information to flat owners makes them aware both of the inefficiency of the property and of how to address it, removing a barrier for those otherwise unlikely to be aware of how to achieve savings such as the elderly.
Source	Let's live warmer Ekonomikas ministrija https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4375 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/950 https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/604
Affected Stakeholder	Homeowners, Housing associations
Expected impacts	Effectiveness: Programs like ENSVET offer personalized advice, making energy efficiency measures more accessible to older homeowners. Multilevel campaigns, such as the one in the Czech Republic, ensure that information reaches a broad audience, including the elderly. Combining information programs with subsidies or tax deductions can motivate older homeowners to undertake renovations. Benefits: These programs aim to reach a wide audience, including older homeowners, to promote energy efficiency. <u>Information campaign on raising awareness about energy efficiency (Czech Republic):</u> 30PJ cumulative energy savings 2021-2030 <u>Energy advice network for citizens -ENSVET (Slovenia):</u> 2.4 PJ cumulative energy savings 2010-2021 82 kt CO2 cumulative emission savings 2010-2021 Cost (social and public): Government agencies typically fund these information programs. Information programs are usually free for participants. Ensuring that information is accessible to all demographics, including those with limited digital literacy, is crucial. Context: Scalability: Information programs can be scaled nationally or regionally. Ensuring active participation from older homeowners may require targeted strategies. Speed of implementation: Information campaigns can be implemented relatively quickly, although it may take longer for actual savings to be realised from renovations. Energy demand reductions from behavioural change may be able to be achieved more quickly. Replicability: Similar programs can be implemented in other countries. The greatest impact can be achieved in countries with a greater proportion of elderly homeowners.

Name of the supporting measure:	Energy efficiency information programmes
Details affecting delivery	Campaign needs to be delivered via media likely to actually reach and engage the elderly population.
Source (impacts):	As above.

Table 6-45 State guaranteed loans for energy efficiency measures

Name of the supporting measure:	State guaranteed loans for energy efficiency measures
Short description	A state guarantee scheme that enables apartment owners in multi-apartment buildings who do not have sufficient funds to finance investments for implementation of energy efficiency measures to take out a loan at a commercial bank secured with a state guarantee.
Geographical scope	SI
Category/type of measure	Financing - Soft loans/loans
Rationale	State guarantees allow those who would otherwise struggle to obtain loans, such as the elderly, to secure funds for energy efficiency measures, removing one of the barriers for this group.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/964
Affected Stakeholder	Owners of flats in multi-apartment buildings.
Expected impacts	Effectiveness: State guarantees reduce the perceived risk for lenders, making loans more accessible to older homeowners who might otherwise be ineligible. With reduced financial barriers, more elderly homeowners are likely to undertake energy efficiency renovations. Coupling financial support with targeted information campaigns can enhance awareness and uptake among older populations. Providing guidance on selecting appropriate energy efficiency measures ensures effective use of funds. Benefits: Focuses on apartment owners in multi-apartment buildings, addressing a specific, and limited, segment of the housing sector. Cost (social and public): Governments allocate funds to back loans, covering potential defaults and encouraging lender participation. State guarantees often lead to lower interest rates, decreasing the financial burden on homeowners. Ensuring that programs are accessible to all eligible homeowners, regardless of income or credit history, promotes social equity. Context: A significant portion (23%) of Slovenia's housing stock comprises multi-apartment buildings, many requiring energy efficiency upgrades. Slovenia has an aging building stock, with the majority of buildings constructed prior to 1980. Scalability: The scheme could be scaled up to include other types of dwelling and reach more stakeholders. Speed of implementation: Establishing guarantee schemes involves coordination between government agencies and financial institutions, which could slow implementation. Replicability: The concept of state-guaranteed loans for energy efficiency is adaptable to various countries and regions. Countries with a significant number of multi-apartment

Name of the supporting measure:	State guaranteed loans for energy efficiency measures
	buildings and aging populations would benefit most from a programme like this example, however if scaled up to include other dwelling types, this would be broadly replicable.
Details affecting delivery	None
Source (impacts):	https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/07/housing-market-challenges-and-policy-options-in-slovenia_54a982ce/fab74d9f-en.pdf https://energy.ec.europa.eu/system/files/2018-11/slovenia_en_version_1.pdf

6.5 INDUSTRY – WILLINGNESS

This subsection contains the expanded measures from the long list of measures, in table format for Industry – Willingness.

Table 6-46 Voluntary Energy Efficiency Agreements

Name of the supporting measure:	Voluntary Energy Efficiency Agreements
Short description	BE - From 2003 to 2020 Flanders and Wallonia have allowed industrial companies to participate in voluntary agreements for improving energy efficiency. In Flanders, energy-intensive industries (annual energy demand > 0.1 PJ) and requires companies to implement an energy management system or an ISO 50001 certification. SMEs in particular have access to support for energy audits and subsidies for energy efficiency projects. In Wallonia, voluntary agreements require energy efficiency and GHG reduction targets, annual progress monitoring, and carbon footprint analysis. Industry federations set collective targets and develop low-carbon roadmaps. The second round of agreements covers 228 companies and 90% of industrial energy demand and has been extended with new targets through 2023. FI - Finland's Voluntary Energy Efficiency Agreements are a collaborative initiative between the government and various sectors, aiming to enhance energy efficiency without resorting to legislation. These agreements serve as a flexible alternative to mandatory measures, allowing companies and municipalities to implement energy-saving actions tailored to their specific needs and timelines. The Finnish government offers subsidies for energy audits and investments in energy-efficient technologies, incentivising participation and facilitating the adoption of innovative solutions.
Geographical scope	BE, FI
Category/type of measure	Voluntary agreements, Financing - grants/subsidies
Rationale	The lack of willingness could be overcome with incentives and disincentives. With these agreements, incentives were the pull factor for companies while co-definition of goals ensured ownership and penalties guaranteed compliance.
Source	BE - The EPAs EBO Flanders FI - https://energiatehokkuussopimukset2017-2025.fi/en/join-the-agreement/

Name of the supporting measure:	Voluntary Energy Efficiency Agreements
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: Voluntary agreements incentivise companies to decarbonise by supporting energy auditing, energy management implementation systems, and official commitments. These agreements often interact with regional subsidy schemes (such as the Easy Green programme in Wallonia). Benefits: (BE) Total cumulative savings from voluntary agreements in Flanders are expected to be 162.36 PJ. (FI) Between 2008 and 2016 annual energy consumption was reduced by 16 TWh (68 percent of energy savings was realised in the industrial sector). Carbon dioxide emissions were reduced by 4.6 Mt per year. Cost (social and public): (FI) during the 2008-2016 window, the measure costed EUR 105 million, of which EUR 13 million for energy audits and EUR 92 million for energy efficiency improvements. Participants invested over EUR 1.3 billion in the same period. Of these, 41% were invested in the industrial sector. Context: Scalability: The policies can be scaled to include less energy-intensive industries, or other sectors not yet included Speed of implementation: Such policies would require some degree of coordination between governments and industries. The speed of implementation can also be affected by the need to create buy in and the readiness of small industry to participate. Replicability: These measures can be replicated in other countries, with effectiveness depending on the number of public subsidies that could be provided, alongside the willingness of the private sector to participate in such agreements.
Details affecting delivery	The effectiveness of voluntary energy efficiency agreements can be significantly affected by the willingness of the businesses, municipalities and other actors. The Finnish example is not limited to specific sectors. Other countries may decide to limit voluntary agreements to specific sectors, depending on decarbonisation priorities and readiness of private actors.
Source (impacts):	The EPAs EBO Flanders https://energyefficiencyagreements2008-2016.fi/mita-saavutimme-vuosina-2008-2016

Table 6-47 Business Pool

Name of the supporting measure:	Business Pool
Short description	Business Pool is a programme that supports energy and CO₂ saving projects up to 50%, increasing the profitability of low-carbon technologies adoption. Private companies can receive grants for projects that save energy or CO₂, such as replacement of gas boilers, optimisation of process plants, internal utilisation of surplus heat. The financial support is in the form of grants, whose size is based on: • kWh saved • CO₂ saved • Company size: ○ Up to 50% for small businesses ○ Up to 40% for medium businesses ○ Up to 30% for large businesses

Name of the supporting measure:	Business Pool
Geographical scope	DK
Category/type of measure	Financing - grants/subsidies
Rationale	By receiving grants, companies can finance up to 50% of their green investment without having to reimburse the funds. This lowers the effective cost reducing the economic burden on firms.
Source	https://sparenergi.dk/erhvervspuljen
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: The measure effectively reduces costs for firms that undergo decarbonisation activities through the implementation of low-carbon technologies. The measure may interact with other financial incentives schemes at the local/national/EU level. Benefits: There are no limitations to the sectors included in the programme. In 2022, committed annual energy savings were 495.7 GWh, while committed annual CO2 reductions were 138 kt CO2. Cost (social and public): The programme is funded by the Danish Energy Agency. Context: Implemented in Denmark only. Scalability: The measure can support firms of different size. The grant is accorded in proportion to energy and CO2 savings, so the aid is proportional to environmental benefits. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: The replicability will ultimately depend on fund availability. If no sufficient resources are available, grants can be mixed with other financial incentives less onerous for authorities.
Details affecting delivery	Business Pool uses grants to incentivise energy and emission savings. The design allows to provide (proportionally) more support to small and medium enterprises. This allow for a certain flexibility, that could be used to adapt the policy to varying contexts.
Source (impacts):	https://ens.dk/media/1125/download https://sparenergi.dk/erhvervspuljen

Table 6-48 Energy Saving Loan and the Green Loan

Name of the supporting measure:	Energy Saving Loan and the Green Loan
Short description	The Energy Saving Loan (Prêt Économie d'Énergie) was introduced by Bpifrance in 2012 to finance equipment and installation costs eligible under the white certificates scheme. It supports small and medium companies in industry and tertiary sectors by covering up to 40% of the loan amount for resource optimisation, product/process design, and standardised operations. The Green Loan is designed to help SMEs and mid-sized companies (SMIs) improve environmental performance and competitiveness through industrial process upgrades, decarbonisation, green mobility, and waste management. Both measures included guarantees on the loan, and deferred repayment options.

Name of the supporting measure:	Energy Saving Loan and the Green Loan
Geographical scope	FR
Category/type of measure	Financing - grants/subsidies
Rationale	By being able to access to low-interest loans and loan-guarantees, companies can finance energy efficiency improvements.
Source	Energy Efficiency Policies & Measures Database, Graph and Summary Table
Affected Stakeholder	SMEs
Expected impacts	Effectiveness: The measure effectively reduces costs for firms that undergo decarbonisation activities through the implementation of low-carbon technologies. The measure may interact with other financial incentives schemes at the local/national/EU level. Benefits: The direct financial impact of energy saving loans is estimated at around EUR 140 million between 2020 and 2022. Cost (social and public): Both programmes are financed by a state-owned investment bank. The French government has supported Bpifrance with EUR 220 million for subsidies under the Green Loan measure. Context: Implemented in France only. Scalability: The measure can support firms of different size. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: The replicability will ultimately depend on fund availability.
Details affecting delivery	Both programmes are financed by Bpifrance, a French public sector investment bank. The measures are designed to support small and medium enterprises. Such support is in the form of loans ranging from EUR 10,000 to EUR 500,000 in the case of ESL, and from EUR 50,000 to EUR 5 million in the case of the Green Loan.
Source (impacts):	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1122

Table 6-49 Energy efficiency networks for the industry

Name of the supporting measure:	Energy efficiency networks for the industry
Short description	This programme provided public funding to branch-specific energy efficiency networks which are incentivised to promote long-term cooperation between companies. These networks typically operate over four years, enhancing skills and fostering lasting collaboration even after funding ends. The Swedish Energy Agency primarily funds these initiatives as forums for sharing knowledge and best practices, but not for direct implementation of energy-saving measures. Industry networks focused on improving energy efficiency in industrial processes.
Geographical scope	SE
Category/type of measure	Awareness, technical support and training, Financing - grants/subsidies

Name of the supporting measure:	Energy efficiency networks for the industry
Rationale	This measure incentivises communication and knowledge sharing between companies operating in the same sectors. A such, best practices and experiences about decarbonisation investments and transition to low-carbon technologies can be shared, reducing the perceived risk of impact on product quality.
Source	Energig - Energy efficiency networks https://www.sciencedirect.com/science/article/pii/S1364032116303227
Affected Stakeholder	SMEs, Large enterprises
Expected impacts	Effectiveness: Knowledge sharing networks can help firms bridge skills gaps. Such measures can act in synergies with other measures such as financial schemes to subsidise energy audits or energy-efficiency improvements. Benefits: Cost (social and public): The government initially subsidised the industry networks. Context: These supporting measures have been implemented across a wide range of EU Member States. Scalability: Such measures can be scaled up by increasing the budget for initiatives such as events, trainings and workshops. Speed of implementation: Knowledge sharing activities can be implemented quickly. Replicability: Given their nature, such measures can be implemented across the EU with no relevant barriers. It is likely that the effects of external support will be larger in countries where SMEs make up a large share of the companies.
Details affecting delivery	None
Source (impacts):	Energig - Energy efficiency networks https://www.sciencedirect.com/science/article/pii/S1364032116303227

Table 6-50 Innovation Fund

Name of the supporting measure:	Innovation Fund
Short description	The Innovation Fund focuses on highly innovative technologies and flagship projects within Europe that can bring about significant emission reductions. The Innovation Fund focuses mainly on the demonstration stage, moving a project from the pilot to the scale-up stage. Additionally, the Fund showcases successful implementation of newly developed technologies, thereby reducing perceived risk associated with such innovative solutions.
Geographical scope	EU
Category/type of measure	Financing - grants/subsidies
Rationale	From pilot to market uptake, demonstration is challenging step in technological development, in particular from small to large demonstration projects because they require larger investments that a company cannot bear. Grants allocated through a competitive bidding can ensure that the most promising technologies are financed and developed.

Name of the supporting measure:	Innovation Fund
Source	https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund_en
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: As of the end of 2022, the Fund had provided EUR 3.14 billion to support selected projects. These funds are expected to support projects with innovative technologies, increasing the availability of alternatives for other companies in the relevant sectors. The IF acts in synergy with other investment-support initiatives such as InvestEU, EIB programmes, Horizon Europe and the Connecting Europe Facility. Benefits: Selected projects are expected to deliver a 215 Mt CO₂e emission reduction over a period of 10 years. Cost (social and public): The fund will be financed with proceedings from EUA auctions. The total budget estimated based on a carbon price equal to EUR 75 per tonne of CO₂ is EUR 40 billion, in 2020-2030. Context: This is an EU-wide programme. 70 Projects were selected in 20 of the 30 eligible countries (EU and EEA). Scalability: The programme could include more projects in the future. Speed of implementation: As an EU-wide mechanism, this scheme can be complex, resulting in slow implementation speed. Replicability:
Details affecting delivery	None
Source (impacts):	Innovation Fund progress report 2022 - Publications Office of the EU

Table 6-51: Green Deal Industrial Plan and Net-Zero Industry Act

Name of the supporting measure:	Green Deal Industrial Plan and Net-Zero Industry Act
Short description	The Green Deal Industrial Plan (GDIP) is the European Union's strategy to boost the competitiveness of its clean-tech industries while accelerating the transition to a net-zero economy. The GDIP makes it a top priority to create a simpler and more predictable regulatory framework. In combination with net-zero mandates, the GDIP aims to reduce uncertainty on policy development, thus facilitating companies' decision making. The Net-Zero Industry Act reduces uncertainty by providing clear investment signals for industries (e.g., hydrogen, batteries etc.) and simplifies administrative procedures for developing net-zero manufacturing projects. This aims to facilitate planning and increase investment certainty.
Geographical scope	EU
Category/type of measure	Regulation & standards
Rationale	The Green Deal Industrial Plan and the Net-Zero Industry Act establish a strategy for the decarbonisation of the industry and reduce uncertainty over the evolution of policies.

Name of the supporting measure:	Green Deal Industrial Plan and Net-Zero Industry Act
Source	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan_en https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act_en
Affected Stakeholder	Large Companies, SMEs
Expected impacts	Effectiveness: These measures can effectively support companies by providing a clear and long-term framework for the decarbonisation of industry. Benefits: The goal is to reach a climate-neutral industry by 2050. Cost (social and public): Context: These plans have been approved as part of the broader climate strategy in the EU. Scalability: These initiatives can scale by leveraging public-private investments, streamlining permitting processes, and enhancing workforce skills to expand clean-tech industries across the EU. Speed of implementation: As EU-wide measures, their design and implementation require significant coordination efforts between all parties involved. Replicability: medium to long term planning can be replicated in MSs to anticipate EU legislation, or to complement it.
Details affecting delivery	None
Source (impacts):	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan_en https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act_en

Table 6-52 Fiscal incentive to fuel switching

Name of the supporting measure:	Fiscal incentive to fuel switching
Short description	Germany's Carbon Contracts for Difference (CCfD) program is designed to incentivise energy-intensive industries to adopt climate-friendly production processes by offsetting the additional costs associated with these technologies. This mechanism provides financial stability, encouraging investments in sustainable practices.
Geographic scope	DE
Category/type of measure	Financing – grants/subsidies
Rationale	This measure incentivises the adoption of low-carbon technologies by compensating the additional costs of such technologies. In addition, CCfDs reduce financial risks, by providing stability to the investment.

Name of the supporting measure:	Fiscal incentive to fuel switching
Source	https://www.klimaschutzvertraege.info/en/home https://www.klimaschutzvertraege.info/lw_resource/datapool/systemfiles/agent/ewbpublicati ons/f7531bfd-eb98-11ee-8b39-a0369fe1b6c9/live/document/2403_EN_BMWK-FAQ_Klimaschutzvertraege.pdf
Affected Stakeholder	SMEs, Large Companies, Energy Suppliers
Expected impacts	Effectiveness: This measure can effectively support companies by reducing the costs associated to the transition to cleaner technologies, while also providing stability to the investment. Benefits: This programme aims to incentivise the transition towards a more sustainable industry. The projects that obtained financial support in the first bidding round could deliver 17 Mt CO₂e emissions reduction over the next 15 years. Cost (social and public): (DE) The budget for the first round of auctions is set to EUR 4 billion. Context: Scalability: (DE) the project is directed to Large and SMEs emitting at least 10 ktCO₂ per year. The measure could potentially be expanded to include firms below the current threshold, conditional to providing the necessary funding. Speed of implementation: This measure requires administrative infrastructure to set up the financing mechanism. Replicability: high replicability possible, depending on available funding.
Details affecting delivery	Despite being directed mainly to large companies this scheme can also include SMEs, emitting more than 10 ktCO ₂ per year.
Source (impacts):	As above.

Table 6-53 Business Pool

Name of the supporting measure:	Business Pool
Short description	Business Pool is a programme that supports energy and CO₂ saving projects up to 50%, increasing the profitability of low-carbon technologies adoption. Private companies can receive grants for projects that save energy or CO₂, such as replacement of gas boilers, optimisation of process plants, internal utilisation of surplus heat. The financial support is in the form of grants, whose size is based on: • kWh saved • CO₂ saved • Company size: ○ Up to 50% for small businesses ○ Up to 40% for medium businesses ○ Up to 30% for large businesses
Geographical scope	DK

Name of the supporting measure:	Business Pool
Category/type of measure	Financing - grants/subsidies
Rationale	By receiving grants, companies can finance up to 50% of their green investment without having to reimburse the funds. This lowers the effective cost reducing the economic burden on firms.
Source	https://sparenergi.dk/erhvervspuljen
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: The measure effectively reduces costs for firms that undergo decarbonisation activities through the implementation of low-carbon technologies. The measure may interact with other financial incentives schemes at the local/national/EU level. Benefits: There are no limitations to the sectors included in the programme. In 2022, committed annual energy savings were 495.7 GWh, while committed annual CO2 reductions were 138 kt CO2. Cost (social and public): The programme is funded by the Danish Energy Agency. Context: Implemented in Denmark only. Scalability: The measure can support firms of different size. The grant is accorded in proportion to energy and CO2 savings, so the aid is proportional to environmental benefits. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: The replicability will ultimately depend on fund availability. If no sufficient resources are available, grants can be mixed with other financial incentives less onerous for authorities.
Details affecting delivery	Business Pool uses grants to incentivise energy and emission savings. The design allows to provide (proportionally) more support to small and medium enterprises. This allow for a certain flexibility, that could be used to adapt the policy to varying contexts.
Source (impacts):	https://ens.dk/media/1125/download https://sparenergi.dk/erhvervspuljen

Table 6-54 Capital investment for decarbonisation processes

Name of the supporting measure:	Capital investment for decarbonisation processes
Short description	The programme provides grants to support companies in their decarbonisation activities. The grant size is based on the eligible costs, meaning the extra investment costs in a project required to go beyond EU standards for environmental protection, to increase the level of environmental protection in the absence of EU standards or to achieve a higher level of energy efficiency. The minimum grant is EUR 20,000, the maximum grant is EUR 1 million. To ensure value for money, the grant size will depend on the efficiency of the carbon reduction achieved by the project.
Geographical scope	IE
Category/type of measure	Financing - grants/subsidies

Name of the supporting measure:	Capital investment for decarbonisation processes
Rationale	By receiving grants, companies can finance up to 50% of their green investment without having to reimburse the funds. This lowers the effective cost for enterprises and shortens the payback period.
Source	Capital Investment for Decarbonisation Processes Enterprise Ireland capital-investment-for-decarbonisation-processes-reference-document-en-95110.pdf
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: The measure effectively reduces costs for firms that undergo decarbonisation activities through the implementation of low-carbon technologies. The measure may interact with other financial incentives schemes at the local/national/EU level. Benefits: There are no limitations to the sectors included in the programme. In 2022, committed annual energy savings were 495.7 GWh, while committed annual CO₂ reductions were 138 kt CO₂. Cost (social and public): The total budget for the fund is EUR 30 million. Context: Implemented in Ireland only. Scalability: scalability will ultimately depend on available funding and demand from companies. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: The replicability will ultimately depend on fund availability. If no sufficient resources are available, grants can be mixed with other financial incentives less onerous for authorities.
Details affecting delivery	None
Source (impacts):	capital-investment-for-decarbonisation-processes-reference-document-en-95110.pdf

6.6 INDUSTRY – FEASIBILITY

This subsection contains the expanded measures from the long list of measures, in table format for Industry – Feasibility.

Table 6-55 Provision of external support

Name of the supporting measure:	Provision of external support
Short description	AT - The federal program Klimaaktiv for businesses (Klimaaktiv Betriebe) provides comprehensive professional support to companies, ranging from initial analysis to implementation of efficiency measures. Key aspects of the program are cooperation with market-partners for specific technologies, benchmarking, information, training, and awarding of outstanding businesses. CY - Cyprus annual initiatives to promote energy efficiency and renewable energy sources through information campaigns, training, and awareness programs targeting the public, professionals, and businesses. Key activities include participation to international fairs to provide informational materials, promote funding opportunities, and enable knowledge-

Name of the supporting measure:	Provision of external support
	sharing and training activities directed at industry specialists. Additionally, the government organises regular workshops and training programmes on energy efficiency opportunities. FI - Energy advice to industries. In 2009, within the framework of the energy efficiency agreement for industry and businesses, an energy efficiency advice project was started, aimed mainly at medium-sized businesses that had signed up to the agreement. The businesses were from four sectors of industry as well as the tourism and catering sector. Today, there is no distinction according to the size of the company. In the early years energy advice was co-funded by the Ministry of Employment and the Economy (MEE) and by trade associations but today only by the associations. Decisions on the continuation of the activity and funding are made annually. Motiva (government owned company for sustainable development) is responsible for the implementation of the advice project. The advisory activities have included telephone advice, sector-specific seminars, business visits and the production of advice-related materials. IE - The Small and Medium Enterprises (SME) Programme by SEAI (Sustainable Energy Authority of Ireland) is an initiative specifically designed to support energy efficiency improvements in small and medium-sized enterprises across Ireland. The program offers a range of services and incentives to help SMEs reduce energy consumption, lower operating costs, and enhance sustainability. These services include energy audits to identify energy-saving opportunities, expert advice on implementing energy-efficient measures, access to funding and grants for energy efficiency projects, and technical support to facilitate the adoption of energy-efficient technologies. SE - Energy efficiency networks for the industry. Branch-specific networks for energy efficiency are a relatively common component of Swedish endeavours for energy efficiency. These networks usually receive public funding, and they tend to be based on a four-year cooperation between participating companies, whereby skills are enhanced. The purpose of the networks is also to produce lasting cooperation, i.e. after the funding has ended, in many cases cooperation continues, which has an impact on overall energy efficiency developments in Swedish industry. Currently there are four industry-related sector networks with the aim of improving energy efficiency funded primarily by the Swedish Energy Agency.
Geographical scope	AT, CY, FI, IE, SE
Category/type of measure	Awareness, technical support and training
Rationale	Technical assistance and trainings can close the gap related to the lack of internal skills.
Source	AT - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1033 CY - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1072 FI - Maksuton neuvonta - Energiatohokkuussopimukset 2017–2025 Regional energy counselling Energiavirasto IE - Large Industry Energy Network (LIEN) Business & Public Sector SEAI SE - Energigig - Energy efficiency networks
Affected Stakeholder	SMEs, Large Companies, Consumers
Expected impacts	Effectiveness: These measures effectively contribute to addressing the barrier by enhancing internal skills and awareness. Knowledge sharing networks can help firms

Name of the supporting measure:	Provision of external support
	bridge skills gaps. Such measures can act in synergies with other measures such as financial schemes to subsidise energy audits or energy-efficiency improvements. Benefits: (IE) Annual energy savings for 10.33 PJ in 2022, 11.15 PJ in 2023. Estimated annual energy savings until 2030 are equal to 11.97 PJ. Cost (social and public): The financial contribution from public authorities is expected to cover the costs for the creation and distribution of informative material, trainings and workshops. In Sweden, the government no longer subsidises industry network. Context: These supporting measures have been implemented across a wide range of EU Member States. Scalability: Such measures can be scaled up by increasing the budget for initiatives such as events, trainings and workshops. Speed of implementation: External supporting activities requires administrative infrastructure and the identification of experts. The provision of informational material can be implemented with ease. Replicability: Given their nature, such measures can be implemented across the EU with no relevant barriers. It is likely that the effects of external support will be larger in countries where SMEs make up a large share of the companies.
Details affecting delivery	External support programmes can be easily adapted to match country- or region-specific contexts in terms of general awareness, technical expertise, average firm sizes in the sectors involved etc.
Source (impacts):	As above.

Table 6-56 Energy audits

Name of the supporting measure:	Energy audits
Short description	AT - Voluntary Energy Audits for Small and Medium Enterprises. Energy consultations and audits are carried out in Austria by trained and independent auditors. Energy audits for small and medium enterprises (SMEs) are supported in Austria by the Federal States. All Austrian Federal States have their own audit programmes with network of energy consultants. FI - Energy auditing has been one of Finland's main energy conservation tools since 1992. They have been mentioned in all the national climate strategies since 1992. Finland's Energy Audit Programme (the EAP) started as a subsidy policy in 1992, was developed into a programme in 1993 and was launched in practice in 1994. The EAP is a full-scale programme consisting of the following elements: programme administration, detailed guidelines, auditor training and authorisation as well as a monitoring system and promotion activities. The EAP is a voluntary programme but promoted by a 40% subsidy for industrial participants by the Ministry of Economic Affairs and Employment (MEAE). Since 5 June 2014 large companies have not been receiving subsidies for audits because they are within the sphere of mandatory audits required by the Energy Efficiency Directive. IE - SEAI's Support Scheme for Energy Audits (SSEA) will offer SMEs a €2,000 voucher towards the cost of a high-quality energy audit. In most cases, this will cover the total cost of the audit. Application to the scheme is easy, with automatic approval for eligible businesses. SMEs that participate in the programme receive targeted supports to improve energy efficiency including: - Advice and mentoring from a specialist including a site assessment for companies with a significant energy spend, - Training in energy management for groups of SMEs, - Online energy management tools
Geographical scope	AT, FI, IE
Category/type of measure	Awareness, technical support and training
Rationale	Energy audits are a useful tool to increase awareness on actual energy consumption and on ways to increase energy efficiency.
Source	AT - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4379 FI - https://www.motiva.fi/ratkaisut/energiakatselmustoiminta/tuetut_energiakatselmukset IE - Energy Audits for SMEs Business SEAI
Affected Stakeholder	SMEs, Large Companies
Expected impacts	Effectiveness: Energy audits are effective in providing accurate information on how much energy is consumed and in what processes. Often, energy audits are complemented by guidance on actions to improve energy efficiency. These measures are expected to interact with policies aimed at increasing awareness and at providing financial support for decarbonisation. Benefits: (AT) Annual savings for 2020 are estimated in 0.415 PJ, avoiding 15.78 kt CO₂. (IE) Energy savings achieved in 2010 are equal to 180 GWh. Energy savings for 2020 are estimated in 0.828 PJ. Cost (social and public): (FI) Between 1992 and 2014 EUR 37.6 million were given in subsidies. Between 2018 and 2021, 60,000 euros were used to finance energy audits. Context: These measures have been implemented in Austria, Finland and Ireland.

Name of the supporting measure:	Energy audits
	Scalability: Budget is the main constraint to subsidise energy audits. Large companies are no longer eligible as they are obliged to carry out energy audits. Speed of implementation: This will ultimately depend on experts' availability and the needs from the industry sector. Replicability: These measures can be replicated across the EU. The larger benefits would be expected in countries where SMEs do not perform voluntary energy audits. Other Member States could leverage past experience with energy audits programmes in other sectors.
Details affecting delivery	None
Source (impacts):	AT - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4379 FI - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1118 IE - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1180 Energy Audits for SMEs Business SEAI

Table 6-57 Support Programme for the Energy Transition of the Industry (PACTE Industrie)

Name of the supporting measure:	Support Programme for the Energy Transition of the Industry (PACTE Industrie)
Short description	This programme aims to support industry throughout their decarbonisation and energy transition plan by providing tailored training and other support activities. PACTE Industrie can allocate EUR 49 million of subsidies to eligible firms between 2023 and 2026. Trainings are subsidised up to 80% of the cost, while audits are subsidised up to 70% of the cost. To improve energy management, beneficiaries can: - apply to a training on energy optimisation projects adapted to their enterprise. - conduct an audit to assess potential transition of the site's energy mix. - deploy an energy management system compliant with ISO 50001. Firms can also apply to the "ACT pas à pas" training to be assisted in the development of a decarbonisation strategy. PRO-SME incentivises the implementation of ISO 50001 Energy Management Systems in companies, through the payment of a bonus. The premium is equal to 20% of the annual energy expenditure of ISO 50001 certified sites (VAT excl.), up to 40,000 euros.
Geographical scope	FR
Category/type of measure	Awareness, technical support and training, Financing - grants/subsidies
Rationale	Subsidising training activities can help increase skills and knowledge about energy management and decarbonisation strategies.
Source	Industriels, découvrez le programme PACTE Industrie Entreprises Agir pour la transition écologique ADEME https://pro-smen.org/details-de-la-prime-pro-smen/

Name of the supporting measure:	Support Programme for the Energy Transition of the Industry (PACTE Industrie)
Affected Stakeholder	SMEs, Large Companies
Expected impacts	Effectiveness: This measure can effectively increase awareness and internal skills by subsidising trainings, energy management systems and energy audits. The policy acts in synergy with the ACT programme, which provides trainings on decarbonisation. Benefits: The estimated energy savings deriving from the trainings and the technical support provided as part of the programme are 1-2 TWh/year. This represents less than 0.1% of energy consumption in the industrial sector in 2022. Cost (social and public): The budget allocated for this measure is EUR 49 million, between 2023 and 2026. Context: This measure is implemented in France only. Scalability: Scalability will ultimately depend on the available resource to finance trainings and on the availability of trained experts. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: This measure can be implemented across the EU with no relevant barriers. Replicability will be affected by funds availability.
Details affecting delivery	This policy focuses on incentivising trainings and energy audits to improve energy management of firms. Replicating this measure in other countries would produce better results in countries where small industry players lack expertise and do not perform energy audits on a voluntary basis.
Source (impacts):	Industriels, découvrez le programme PACTE Industrie Entreprises Agir pour la transition écologique ADEME

Table 6-58 Feasibility studies of energy performance or decarbonisation of industrial companies

Name of the supporting measure:	Feasibility studies of energy performance or decarbonisation of industrial companies
Short description	This programme is designed to assist SMEs with an industrial activity to perform feasibility studies for energy-efficiency improvements. The feasibility study provides guidance on technical, economic, regulatory and environmental elements ensuring the SMEs have the adequate understanding on the feasibility of energy efficiency or broader decarbonisation initiatives.
Geographical scope	FR
Category/type of measure	Awareness, technical support and training, Financing - grants/subsidies
Rationale	This programme provides companies an understanding on the feasibility for energy-efficiency improvements.
Source	Aide aux études de faisabilité de performance énergétique ou de décarbonation en industrie - les-aides.fr Études de faisabilité de performance énergétique ou de décarbonation d'entreprises industrielles Entreprises Agir pour la transition écologique ADEME
Affected Stakeholder	SMEs

Name of the supporting measure:	Feasibility studies of energy performance or decarbonisation of industrial companies
Expected impacts	Effectiveness: This measure aims to assess the feasibility of decarbonisation plans, and to suggest technical solutions to improve energy efficiency in utilities and processes. This policy may interact with other subsidy schemes for feasibility studies or trainings. Benefits: Cost (social and public): Context: This measure is implemented in France only. The policy context includes several measures aiming to promote energy-efficiency investments. Scalability: The measure can be expanded to cover industry players, by expanding the budget to cover subsidies. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: This measure can be implemented across the EU with no relevant barriers. Replicability will be affected by funds and feasibility study experts' availability.
Details affecting delivery	None
Source (impacts):	Aide aux études de faisabilité de performance énergétique ou de décarbonation en industrie - les-aides.fr Études de faisabilité de performance énergétique ou de décarbonation d'entreprises industrielles Entreprises Agir pour la transition écologique ADEME

Table 6-59 Subsidy schemes

Name of the supporting measure:	Subsidy schemes
Short description	AT - The Domestic Environmental Support Programme (Umweltförderung Inland - UFI) is one of the most important subsidy programmes for companies with the emphasis on climate protection, energy saving, renewable energies and prevention of air pollution. The subsidies consist of an investment grant of up to 30% of the investment costs. Funding is provided for measures for the efficient use of energy in commercial and industrial production processes, the thermal renovation of existing buildings and heat recovery systems. The UFI incentive scheme is financed from the budget of the Austrian Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology. The Kommunalkredit Public Consulting GmbH is entrusted as a settlement agency with the practical development of support programmes. FI- Subsidies for energy audits and energy investments. The energy aid of Ministry of Economic Affairs and Employment is granted to companies and communities for investments in energy saving measures, investments in renewables and for energy audits. Annually part of the budget is earmarked to energy audits and energy saving investments. The aid is applied from Business Finland or the Ministry. The subsidy decision is made by the Ministry when the investment is above 5 million euro or above 1 million euro when it concerns new technology. The subsidy for conventional energy efficiency investments is limited to the participants to the energy efficiency agreements and the subsidy level is typically 20%. Investments to new technology are eligible for subsidy levels of 20–35%. Investments using the ESCO model can benefit of higher subsidy levels. DE - The Environmental Protection Program of the KfW promotional bank provides long-

Name of the supporting measure:	Subsidy schemes
	term financing for environmental protection measures for example in the areas of building and energy technology; building envelopes; machinery; process cooling and heating; heat recovery/waste heat utilization; measurement, regulation and control technology; information and communication technology; procurement of low-emission commercial vehicles; including the associated costs for planning and implementation support for SMEs at favourable interest rates. The anticipated energy savings must be calculated before the application is filed; minimum requirements exist with regard to the level of saving (for new investments: 10% less than the average for the industry; for replacement investments: 30 % less than the mean consumption for the last three years). HU - Corporate income tax credit for energy efficiency investments. The tax incentive can be up to 30% of eligible costs, but not more than the HUF equivalent of EUR 15 million at present value, which can be increased by 20% for small enterprises, and 10% for medium-sized enterprises. The tax incentive can be used at the earliest in the tax year in which the investment became operational, and in the following five tax years. The project must be operated for at least five years. The tax incentive may only be claimed in connection with projects aimed at energy efficiency improvement. No tax credit can be applied with respect to investments aiming at fulfilling the mandatory environmental protection standards or minimum mandatory energy efficiency standards. IT - Transition 5.0. The Plan provides 6.3 billion euros in addition to the 6.4 billion euros from the budget law, for a total of approximately 13 billion in the two-year period 2024-2025. The Transition Plan 5.0 grants a tax credit to enterprises that invest in innovation projects resulting in a reduction in energy consumption. The tax credit is proportional to the expenditure incurred for the investments made and depends on the reduction in final energy consumption (at least 3 percent) or energy savings in processes (at least 5 percent) due to investments in digital activities. LV - Loans for energy efficiency improvement, as well as RES technologies are issued up to 5 MEUR and up to 90% of the project costs (beneficiary contribution from 10%). The main criterion is adequate flow of money - payment of loan due to energy savings. The soft interest rate applied, ALTUM finds and offers the most appropriate solution of financing. The loan can be received by wide range of interested parties of commercial sector – individual merchants, micro enterprises, SMEs, large enterprises, state and municipalities owned companies. NL - On 7 November 2022, Green Credit Guarantee (BMKB-Green) launched to help SMEs to become more sustainable. Applying for a loan under the BMKB-Green goes through the financier of the SME and is guaranteed by the state. Investments in business premises must at least lead to energy label C. PL -The Energy Plus Priority Programme, to be continued in 2020 and 2021, provides grants to entrepreneurial projects related to energy efficient upgrades of industrial installations and devices and heat networks. The beneficiaries of the Programme can seek a grant or loan covering, respectively, 50% or 85% of eligible costs. ES - This program encourages and promotes actions in SMEs and large companies in the industrial sector that reduce carbon dioxide emissions and final energy consumption, by improving energy efficiency. To this end, the best available technologies are incorporated into equipment and processes and energy management systems are implemented. The IDAE is responsible for the coordination and monitoring of the program, while the operational management corresponds to the autonomous communities and cities, through the publication of calls for aids in their territories for the distribution of the amounts assigned to them, and distribution of the aid among the final beneficiaries. The aid, regulated by

Name of the supporting measure:	Subsidy schemes
	Royal Decree 263/2019, of April 12, will be granted in the modality of monetary endowment without compensation, with a maximum amount of 30% of the corresponding eligible investment, and a maximum amount of the eligible investment per application of €4 million.
Geographical scope	AT, FI, DE, IT, LV, HU, NL, PL, ES
Category/type of measure	Financing - grants/subsidies, Financing - Tax incentives, Financing - Soft loans/loans
Rationale	To cover the investments costs, low interest rates/guarantees for loans, tax deductions or grants can be helpful in overcoming the lack of internal fundings.
Source	AT - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1028 FI - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1114 DE - https://www.bundeswirtschaftsministerium.de/Redaktion/EN/Publikationen/national-energy-efficiency-action-plan-eeap.pdf?__blob=publicationFile&v=1 HU - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1172 IT - Transizione 5.0 LV - Loans for energy efficiency or sustainability of companies - Altum NL - SME credit guarantee scheme (BMKB) Business.gov.nl PL - https://www.iea.org/policies/14321-energy-plus-priority-programme ES - Direct granting of aid for energy efficiency actions in SMEs and large companies in the industrial sector Idae
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: These measures use a wide range of financial incentives to effectively reduce the costs associated to energy efficiency improvements. This makes EE improvements more attractive from an investment perspective. Benefits: (AT) cumulative energy savings in 2014-2020 are 60.1 PJ. (DE) Estimated annual savings in 2020 are 1.8 PJ, with a reduction in emissions of 10.9 MtCO₂e. (ES) Cumulative total energy savings for 2030 are 64 PJ. Cost (social and public): (AT) the yearly budget allocated to the measure is EUR 90 million. (FI) The budget for the measure was EUR 198 million from 2018 to 2023. (DE) The budget for 2020 was EUR 2 million. (NL) The government guarantees 90% of the loans. The loan size will depend on the credit needs of firms. The total budget for BMKB is EUR 1.5 billion. (ES) The budget was EUR 626 million between 2019 and 2024. Context: Financial schemes to support energy efficiency improvements have been implemented across the EU. Scalability: Scalability depends on available funding, administrative capacity, and alignment with market demand to ensure widespread adoption. Speed of implementation: Subsidy schemes can be implemented relatively quickly, but effectiveness depends on streamlined administration, timely fund allocation and the complexity of the scheme. Replicability: These measures can be implemented across EU Member States, with budget availability being the main constraint. Financial support can be tailored to reflect varying levels of public resources.
Details affecting delivery	Financing schemes can be adapted based on public resources availability and on companies' needs. Grants may provide a greater incentive to firms, although at the price of

Name of the supporting measure:	Subsidy schemes
	a larger expense for the government. Loan Guarantees and tax deductions can lower the need for public funds but will also decrease the incentive for firms.
Source (impacts):	As above.

Table 6-60 DECARB IND 25 and DECARB IND+

Name of the supporting measure:	DECARB IND 25 and DECARB IND+
Short description	As part of France 2030, DECARB IND 25 is a call for projects, targeted to the industrial sector to reduce GHG emissions. To be eligible, the project must require a minimum investment of €3 million, with a reduction in emissions equal to 1,000 tonnes of CO₂ per year. The technological approach must rely at least on one of the following: - Energy efficiency - Modification of the energy mix - Modification of the material mix - Carbon, capture, upgrading and storage. Projects will be evaluated based on price and non-price criteria. DECARB IND+ follows the same approach but is directed to larger projects, with a minimum investment equal to €50 million, with a maximum aid application equal to €200 million. The total budget for DECARB IND+ is equal to €5 billion.
Geographical scope	FR
Category/type of measure	Financing - grants/subsidies, Financing - Soft loans/loans
Rationale	To cover the investments costs, low interest rates/guarantees for loans, tax deductions or grants can be helpful in overcoming the lack of internal fundings.
Source	https://agirpoulatransition.ademe.fr/entreprises/aides-financieres/20240530/decarbonation-lindustrie-decarb-ind-25 https://agirpoulatransition.ademe.fr/entreprises/aides-financieres/20230619/decarbonation-lindustrie-decarb-ind
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: These measures target the industrial sector by providing funds to support decarbonisation projects. Eligibility is linked to investment size and GHG emission reductions, to ensure projects with large potential are prioritised. Benefits: Cost (social and public): The total budget for DECARB IND+ is EUR 5 billion. Context: These measures have been implemented as part of the France 2030 programme, which dedicates EUR 5.6 billion to the decarbonisation of French industry. Scalability: These programmes can be expanded depending on funds availability. Speed of implementation: This will mostly depend on existing administrative infrastructure to evaluate and process subsidy applications. Replicability: Highly replicable, with main constraint being funds availability.

Name of the supporting measure:	DECARB IND 25 and DECARB IND+
Details affecting delivery	Policies such DECARB IND 25 and DECARB IND+ focus respectively on SMEs and large companies. In both cases, projects are selected depending on their impact. The selection is based on economic efficiency (priority is given to project with higher emission reductions per EUR or aid) and decarbonisation ambition.
Source (impacts):	https://agirpourlatransition.ademe.fr/entreprises/aides-financieres/20240530/decarbonation-lindustrie-decarb-ind-25 https://agirpourlatransition.ademe.fr/entreprises/aides-financieres/20230619/decarbonation-lindustrie-decarb-ind

Table 6-61 Energy Saving Certificates

Name of the supporting measure:	Energy Savings Certificates
Short description	FR - The energy savings certificates (Certificats d'économie d'énergie – CEE) have been established in 2005. The scheme aims to reduce energy demand from multiple sectors. The French Government determines a goal in terms of energy savings, and energy suppliers must bear this goal, in relation to their share of the total supply. Energy suppliers are therefore incentivised to promote energy savings projects. Energy savings projects can be implemented by households, local authorities, or professionals, including all sectors of activity (residential, tertiary, industrial, agricultural, transport, etc.). CEEs are awarded, under certain conditions, by the services of the Ministry of Energy, and then bought by energy suppliers, in order for them to prove they have fulfilled their energy savings quota. ES - The Energy Saving Certificates (CAE) system allows obligated entities (such as gas and electricity companies) to meet their energy-saving requirements by presenting CAEs, which certify recognised final energy consumption reductions resulting from energy efficiency measures. The CAE System aims to contribute to Spain's 2021-2030 energy-saving targets under Directive 2012/27/EU while providing flexibility for obligated entities, reducing compliance costs, improving efficiency, and enabling private entities to record their energy savings. Additionally, it offers financial benefits to consumers and promotes innovation in energy efficiency. Key innovations include: • Delegated subjects (SD): These entities can assume part of the energy-saving obligations on behalf of obligated subjects (SO) and implement efficiency measures. • Auction mechanism: The government can auction energy savings needs, supported by the National Energy Efficiency Fund (FNEE), to increase flexibility and financing options. • National CAE Registry: Ensures traceability of CAEs, managed by the General Directorate of Energy Policy and Mines (MITERD). CAE certificates are issued per kWh and can only be held by SOs or SDs. Obligated entities fulfil their obligations through financial contributions to the FNEE and/or by presenting CAEs, which must be settled within their validity period.
Geographical scope	FR, ES

Name of the supporting measure:	Energy Savings Certificates
Category/type of measure	Regulation & standards
Rationale	These measures are useful tools for national governments as they incentivise energy-efficiency improvements without direct government funding. Such solutions can be used to complement other policies incentivising increased energy-efficiency.
Source	FR: https://www.service-public.fr/particuliers/vosdroits/F35584?lang=en https://www.ecologie.gouv.fr/politiques-publiques/operations-standardisees-deconomies-denergie ES: https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5044
Affected Stakeholder	Consumers, SMEs, Large Companies, Energy Suppliers
Expected impacts	Effectiveness: These measures incentivise energy suppliers to contribute to national energy saving target. Impact assessment show that the measure is effective in achieving energy savings. These policies may interact with other measures mandating or subsidising energy efficiency improvements. Benefits:(FR) For the period 2014-2020, the scheme generated 415.85 TWh of cumulative total savings. 17% of the achieved savings were obtained in the industrial sector. Cost (social and public): As it is currently designed, energy and fuel suppliers bear the costs for renovations. In France, the programme has been amended to ensure that ESC deliver savings in households experiencing energy poverty. Context: These measures have been implemented in several countries within the EU in addition to France and Spain. Scalability: This policy could be expanded depending on the emission reduction/energy saving targets in the country. However, the implementing country should carefully assess the effects on energy suppliers, which will bear the costs of the programme. Speed of implementation: This will mostly depend on existing administrative infrastructure to manage energy saving certificates. Additionally, companies should be given advance notice so that they can prepare for implementation. Replicability: These policies can be replicated in MSs where the energy market is comparable. Energy savings obligations on energy and fuel suppliers must be designed in a balanced way.
Details affecting delivery	These policies incentivise energy efficiency investment across all end-users, including households, local authorities and businesses. In France, the policy was modified to ensure that a certain number of energy-efficiency improvements are directed to low-income households, to address energy poverty.
Source (impacts):	As above.

Table 6-62 Innovation Fund

Name of the supporting measure:	Innovation Fund
Short description	The Innovation Fund focuses on highly innovative technologies and flagship projects within Europe that can bring about significant emission reductions. The Innovation Fund focuses mainly on the demonstration stage, moving a project from the pilot to the scale-up stage.
Geographical scope	EU
Category/type of measure	Financing - grants/subsidies
Rationale	From pilot to market uptake, demonstration is challenging step in technological development, in particular from small to large demonstration projects because they require larger investments that a company cannot bear. Grants allocated through a competitive bidding can ensure that the most promising technologies are financed and developed.
Source	https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund_e
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: As of the end of 2022, the Fund had provided EUR 3.14 billion to support selected projects. Successful projects support the uptake of innovative technologies. The IF acts in synergy with other investment-support initiatives such as InvestEU, EIB programmes, Horizon Europe and the Connecting Europe Facility. Benefits: Selected projects are expected to deliver a 215 Mt CO₂e emission reduction over a period of 10 years. In terms of innovation, the IF aims to support innovative technologies that can help decarbonise industry. Cost (social and public): The fund will be financed with proceedings from EUA auctions. The total budget estimated based on a carbon price equal to EUR 75 per tonne of CO₂ is EUR 40 billion, in 2020-2030. Context: 70 Projects were selected in 20 of the 30 eligible countries (EU and EEA). Scalability: More projects in a wider range of areas could be funded, provided they meet the requirements and there is both available funding and demand from industry. Speed of implementation: As an EU-wide mechanism, this scheme can be complex, leading to a slow implementation process. Furthermore, its effects on innovation will take additional time to materialise due to the time required for project development. Replicability: This scheme could be replicated at the national level. Revenues from carbon pricing measures could be used to fund research and innovative technologies, supporting the idea that carbon pricing can indirectly incentivise innovation.
Details affecting delivery	The innovation fund is an important pillar of the EU decarbonisation strategy as it finances innovation in areas where innovation is needed to reach EU goals. All the beneficiaries are expected to share their acquired knowledge, encourage scaling up to commercial readiness and accelerate the deployment and commercialisation of the supported technologies. In this way, the IF tackles the lack of alternative technologies that may impede industries to decarbonise.
Source (impacts):	Innovation Fund progress report 2022 - Publications Office of the EU

Table 6-63 National Investment Funds supporting R&I

Name of the supporting measure:	National Investment Funds supporting R&I
Short description	FR - France 2030 – Industrial Decarbonisation section of the Investment Plan. The plan is especially targeting the deployment of four technologies to help decarbonise the industrial sector: low-carbon hydrogen, industrial heat from biomass, electrification of processes, and carbon capture, utilisation and storage. The French Acceleration Strategies 2030 accompany industrialisation projects in the same way as those for the design of innovative products. By supporting key stages of development depending on the maturity of innovations, AS promote a better link between upstream and downstream of the deployment of a technology. DE - National decarbonisation programme. This measure is a funding programme concerned with the fields of development, demonstration and market launch. The funding programme is designed in particular to promote the greatest possible reduction in greenhouse gas emissions during the production of emission-intensive goods, the optimisation of process chains, the conversion of processes to the use of renewable energy sources and raw materials, and the substitution of emission-intensive goods and technologies for the conversion of hydrogen as well as technologies for using CO₂. The funding programme is being implemented by the Competence Centre on Climate Change Mitigation in Energy-Intensive Industries (KEI) in Cottbus. IE - SEAI National Energy Research Development and Demonstration (RD&D) Funding Programme. The National Energy RD&D Programme takes a technology-agnostic approach when funding energy RD&D. Prioritisation of energy areas to be funded are decided on the basis of an annual cross-Government consultation which is run by the SEAI (which focuses specifically on the energy sector and its connections to other sectors). This coordinated approach ensures that energy research funding is highly targeted. Funding is available to all relevant areas, and recent research projects include those in areas such as: bioenergy, offshore wind energy, ocean energy, smart grids, hydrogen, solar energy, energy in transport, energy in agriculture, energy efficiency, behavioural change and energy modelling. NL - Accelerated Climate-related Investments in Industry (VEKI). In the Netherlands the VEKI subsidy scheme offers subsidy possibilities for investment projects in emission reduction technologies in industry that have passed development and demonstration, but still had high investment demands and paid back times in excess of 5 years. Eligible projects include e.g. investments related to energy efficiency, recycling of waste, local infrastructure and/or other CO₂ reduction technologies
Geographical scope	FR, DE, IE, NL
Category/type of measure	Financing - grants/subsidies
Rationale	Technologies could pass the demonstration stage but costs for large production scale or/and additional investments costs could hinder their possibility of market uptake. Grants to close this gap can bridge the two sides of R&I.
Source	FR - PEPR Spleen - PEPR Spleen DE - NECP (en version, p.259) https://commission.europa.eu/publications/germany-final-updated-necp-2021-2030-submitted-2024_en Federal Fund for Industry and Climate Action: Module 1 Kompetenzzentrum Klimaschutz in energieintensiven Industrien (KEI)

Name of the supporting measure:	National Investment Funds supporting R&I
	IE - NECP (p.308-310) https://commission.europa.eu/publications/ireland-final-updated-necp-2021-2030-submitted-2024_en NL - DEI+: Energy and Climate Innovations RVO.nl
Affected Stakeholder	SMEs, Large Companies
Expected impacts	Effectiveness: These measures enhance innovation by supporting innovative decarbonisation solutions in the industrial sector. These include the deployment of low-carbon hydrogen, renewable energy, optimisation of processes. Technologies that have passed development and demonstration are supported to ensure their access to the market. Benefits: (FR) It is estimated that the 270 projects supported will achieve emission reductions of 6.6 MtCO₂e per year. Cost (social and public): (FR) France 2030 has a budget for industrial decarbonisation equal to EUR 5.6 billion for operations in 2021-2025. Context: National investment funds have been implemented in several European countries. Scalability: these measures can be scaled up but should be limited to relevant technologies with high potential in terms of efficiency improvements / emissions reduction. Speed of implementation: Implementing national investment funds require funding allocation processes, regulatory approvals and time for project evaluation. Industry players may require some time to consider participation. Results on innovation require additional time as supported project must be developed. Replicability: These policies are highly replicable, but the extent of replication will ultimately depend on public resource availability.
Details affecting delivery	None
Source (impacts):	FR - PEPR Spleen - PEPR Spleen DE - NECP (en version, p.259) https://commission.europa.eu/publications/germany-final-updated-necp-2021-2030-submitted-2024_en Federal Fund for Industry and Climate Action: Module 1 Kompetenzzentrum Klimaschutz in energieintensiven Industrien (KEI) IE - NECP (p.308-310) https://commission.europa.eu/publications/ireland-final-updated-necp-2021-2030-submitted-2024_en NL - DEI+: Energy and Climate Innovations RVO.nl

6.7 INDUSTRY – REGULATION

This subsection contains the expanded measures from the long list of measures, in table format for Industry – Regulation.

Table 6-64 Sustainable Industry Infrastructure Program (PIDI) & Multi-Year Program Infrastructure Energy and Climate (MIEK)

Name of the supporting measure:	Sustainable Industry Infrastructure Program (PIDI) & Multi-Year Program Infrastructure Energy and Climate (MIEK)
Short description	Sustainable Industry Infrastructure Program (PIDI) & Multi-Year Program Infrastructure Energy and Climate (MIEK). PIDI includes a Multi-Year Program Infrastructure Energy and

Name of the supporting measure:	Sustainable Industry Infrastructure Program (PIDI) & Multi-Year Program Infrastructure Energy and Climate (MIEK)
	Climate (MIEK), in which stakeholders make agreements about the main infrastructure for sustainable industry (in the clusters) and projects with national importance, including regional projects with consequences for the national energy system, are discussed. This concerns the infrastructure for H ₂ , CO ₂ , electricity, heat, gas and the circular economy. Cluster Energy Strategies (CES) and a safehouse are also used for secure exchange of relevant data for the program.
Geographical scope	NL
Category/type of measure	Regulation & standards
Rationale	Despite not directly implying changes to regulated processes, these programmes provide an example on how industry and government can cooperate to develop a roadmap for infrastructure development. Such a scheme could inspire cooperation in other areas, where regulation poses a barrier to decarbonisation.
Source	Multi-year Programme for Energy and Climate Infrastructure (MIEK) RVO.nl
Affected Stakeholder	SMEs, Large companies
Expected impacts	Effectiveness: PIDI and MEIK are related projects that aim to accelerate the creation of infrastructure for sustainable industry, considering the priorities as outlined by the industrial sector and lowering the frictions to the transition. Benefits: Cost (social and public): Context: This policy has been implemented in the Netherlands. Scalability: Coordination on infrastructure development or other focal points for decarbonisation can be scaled up by allowing more stakeholders to participate to discussions. Speed of implementation: The time required for consultation between industry and government depends on the type of engagement activity, the complexity of the discussed policies and the willingness of the industry sector to contribute to have consultation. Replicability: This measure could be replicated in other MSs and in other sectors to cover issues related to regulated processes. This would require cooperation between industry, experts and regulatory bodies.
Details affecting delivery	None
Source (impacts):	As above.

Table 6-65: Regulatory sandboxes for low-carbon innovation

Name of the supporting measure:	Regulatory sandboxes for low-carbon innovation
Short description	The Netherlands started testing sandboxes in 2015. Over a four-year period, 18 projects were awarded a sandbox. The projects included in the programme could benefit from a ten-year exemption to “normal regulation”. Additionally, regulatory sandboxes have been reserved for

Name of the supporting measure:	Regulatory sandboxes for low-carbon innovation
	small players in the energy sector, including energy communities and homeowner associations.
Geographic scope	NL
Category/type of measure	Regulation & standards
Rationale	Despite not directly implying changes to regulated processes, these programmes provide an example on innovation can be promoted by allowing specific innovative projects to reach latest stages of development in a protected environment.
Source	https://www.ofgem.gov.uk/energy-regulation-sandbox#:~:text=What%20is%20a%20Regulatory%20Sandbox,of%20the%20usual%20rules%20applying. https://fsr.eui.eu/regulatory-sandboxes-in-the-energy-sector-the-what-the-who-and-the-how/
Affected Stakeholder	SMEs
Expected impacts	Effectiveness: The sandbox fosters closer collaboration between innovators, regulatory authorities, and industry stakeholders, helping to ensure that innovations meet regulatory requirements. This collaboration enhances trust between the private and public sectors and informs future policymaking, leading to more adaptive and forward-looking regulations. Cost (social and public): No specific cost information was found for this programme. However, the public agencies that managed the initiative incurred costs related to staff to review, evaluate and monitor sandbox projects, and manage the initiative. Context: This measure has been implemented in the Netherlands, where other initiatives are in place to foster innovation and increase coordination between industry players and regulators. Scalability: The program can be scaled up by increasing the number of admitted projects, for example, by including a broader range of innovators. Speed of implementation: The time required for consultation between industry and government depends on the type of engagement activity, the complexity of the discussed policies and the willingness of the industry sector to contribute to have consultation. Replicability: This measure could be replicated in other MSs and in other sectors.
Details affecting delivery	None
Source (impacts):	https://www.ofgem.gov.uk/energy-regulation-sandbox#:~:text=What%20is%20a%20Regulatory%20Sandbox,of%20the%20usual%20rules%20applying. https://fsr.eui.eu/regulatory-sandboxes-in-the-energy-sector-the-what-the-who-and-the-how/

Table 6-66 Fiscal incentive to fuel switching

Name of the supporting measure:	Fiscal incentives to fuel switching
Short description	Germany's Carbon Contracts for Difference (CCfD) program is designed to incentivise energy-intensive industries to adopt climate-friendly production processes by offsetting the additional costs associated with these technologies. This mechanism provides financial stability, encouraging investments in sustainable practices.
Geographic scope	DE
Category/type of measure	Financing - grants/subsidies
Rationale	If the compliance costs cannot be lowered or eased directly, additional costs can be covered with a subsidy to make the fuel switching competitive against the actual fuel.
Source	FR - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5168 DE - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4676
Affected Stakeholder	SMEs, Large Companies, Energy Suppliers
Expected impacts	Effectiveness: These measures can effectively support companies by reducing the costs associated to the transition to cleaner fuels, despite not targeting regulatory costs directly. Benefits: This programme aims to incentivise the transition towards a more sustainable industry. The projects that obtained financial support in the first bidding round could deliver 17 Mt CO₂e emissions reduction over the next 15 years. Cost (social and public): (DE) The budget for the first round of auctions is set to EUR 4 billion. Context: Scalability: (DE) the project is directed to Large and SMEs emitting at least 10 ktCO₂ per year. The measure could potentially be expanded to include firms below the current threshold, conditional to providing the necessary funding. Speed of implementation: This measure requires administrative infrastructure to set up the financing mechanism. Replicability: high replicability possible, depending on available funding.
Details affecting delivery	None
Source (impacts):	FR - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5168 DE - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4676 https://www.klimaschutzvertraege.info/en/home https://www.klimaschutzvertraege.info/lw_resource/datapool/systemfiles/agent/ewbpublications/f7531bfd-eb98-11ee-8b39-a0369fe1b6c9/live/document/2403_EN_BMWK-FAQ_Klimaschutzvertraege.pdf

Table 6-67 Heat Fund

Name of the supporting measure:	Heat Fund
Short description	Introduced in 2008, this fund supports projects for the production of heat for renewable energies and energy recovery. The activities include financial support for installation costs, feasibility studies and technical support. Several types of projects are supported, namely: • Biomass installations producing at least 1,200 MWh/year. • Solar Thermal installations for hot water production. • Geothermal heat pumps. • Biogas methanisation installations for heat networks. • Heat networks fuelled by at least 50% RE&R. • Cold networks in overseas territories. • Waste heat recovery.
Geographical scope	FR
Category/type of measure	Financing - grants/subsidies, Awareness, technical support and training
Rationale	If the compliance costs cannot be lowered or eased directly, additional costs can be covered with a subsidy to make the fuel switching competitive against the actual fuel.
Source	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4430
Affected Stakeholder	SMEs. Large companies, Energy suppliers
Expected impacts	Effectiveness: The programme creates incentives for enterprises to invest in renewable heating. 78% of beneficiaries stated that, without the subsidy, no investment would have been made, confirming that subsidies can offset transition costs and support the transition. Benefits: During the period 2009-2022, it has supported more than 7,145 installations, generating 42.6 TWh/year of additional energy production. Ex-ante avoided emissions are equal to 7.6 MtCO₂ per year, between 2025 and 2034, declining to 4.2 MtCO₂ from 2035 onwards. Cost (social and public): The financial contribution from the government was EUR 520 million in 2022. Context: Scalability: could include other fuel switching investments. Speed of implementation: This measure requires the development of administrative infrastructure to evaluate projects and administer funds allocation. Replicability: high replicability possible, depending on available funding.
Details affecting delivery	
Source (impacts):	As above.

Table 6-68 Infrastructure development for alternative fuel

Name of the supporting measure:	Infrastructure development for alternative fuel
Short description	HR - Equipping the transport gas system for the future possibility of transporting up to 100% hydrogen. This measure includes the project of planning and reconstruction of gas nodes and safety and measuring equipment for the reception and addition of decarbonised gases to the gas transmission system. It includes the development of a 'smart gas network' including advanced digital systems and components, control systems, sensor technologies, gas flow and quality management devices (compressors, gas flow control kits, reconstruction and chromatography equipment, etc.), to enable interactive and intelligent monitoring, measurement, quality control and management of the reception and transmission of decarbonised gases. The implementation of the project will allow the reception and mixing of decarbonised gases (biomethane and hydrogen) into the gas transmission system, which will reduce greenhouse gas emissions and facilitate the transition to a transmission system that will transport 100% of decarbonised gases in the future. The project will contribute to achieving the objectives set by the European Green Deal. The implementation of this measure is expected in the next 10-15 years, and according to the first indicative estimates, the required investments amount to EUR 54 million.
Geographical scope	HR
Category/type of measure	Financing - grants/subsidies
Rationale	Regulatory standards require to be fulfilled. The compliance demand additional investments. Addressing investment costs as early as possible can ease the fuel switching.
Source	HR - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5375
Affected Stakeholder	SMEs, Large companies, Energy Suppliers.
Expected impacts	Effectiveness: (HR) the measure will facilitate access to sustainable fuel for industrial firms and is expected to interact with the broader national strategy for the development of a hydrogen network. Benefits: Cost (social and public): (HR) The programme is expected to require EUR 54 million in investments. Context: Scalability: high scalability, especially in countries/regions where no infrastructure for hydrogen exists. Scalability will depend on available funding. Speed of implementation: (HR) The project itself is expected to last 10-15 years. Replicability: high replicability possible, depending on available funding and development potential for energy infrastructure.
Details affecting delivery	This measure involves the development of decarbonized gas infrastructure to support the transition to a more sustainable economy. While the project is planned over a 10–15-year timeframe, it could be implemented in different phases to accelerate its impact within a shorter time horizon.
Source (impacts):	HR - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/5375 NL - https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/4644

Name of the supporting measure:	Infrastructure development for alternative fuel
	https://cordence.com/insights/the-transition-of-energy-intensive-industries-and-the-role-of-public-private-partnerships/



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