LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

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DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Environnement, du Climat
et de la Biodiversité

Luxembourg Social Climate Plan
–
Draft Proposal

October 2025

Note on the budgetary implications of the Social Climate Plan:
As this is a draft document subject to change during the public consultation phase, the measures proposed herein have not yet been budgeted. It is understood that any measures within the Social Climate Plan that affect public finances will be subject to the standard budgetary procedure.

Executive Summary

1. SOCIAL CLIMATE PLANOVERVIEW AND PROCESS FOR ESTABLISHING THE SOCIAL CLIMATE PLAN

1.1. Executive Summary

1.1.1.Context of the green transition

Context

The European Union has committed, through the European Green Deal, to achieving climate neutrality by 2050. As part of the 'Fit for 55' package, a series of measures has been adopted to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. One of the key elements of this strategy is the gradual extension of Directive 2003/87/EC on the EU Emissions Trading System (EU ETS) to new sectors, including buildings and road transport, which account for a significant share of emissions in the EU.

The EU ETS operates on the polluter pays principle, whereby those responsible for greenhouse gas emissions must bear the associated costs. With its extension to the building and road transport sectors, this principle now applies not only to economic actors but also to households, through the pricing of fossil fuels. By introducing a carbon price, the system increases the cost of fossil fuels, thereby encouraging all stakeholders to reduce consumption and shift toward more attractive renewable alternatives. This pricing mechanism is designed to guide behaviour toward more sustainable choices, foster technological innovation, and accelerate the energy transition—while ensuring a fair distribution of climate efforts across all sectors of society.

In 2005, the European Union established a carbon market—EU ETS 1—which covers greenhouse gas (GHG) emissions from large-scale industry, energy production, aviation, and maritime transport. A second system, EU ETS2, is scheduled to enter into force in 2027 or 2028. This new market will target CO_2 emissions resulting from the combustion of fossil fuels in the road transport, building, construction, and small industry sectors. EU ETS2 is based on a European cap-and-trade mechanism for emissions allowances. Unlike EU ETS 1, which applies directly to large emitters, EU ETS2 adopts an 'upstream' approach: energy suppliers and fuel distributors will be responsible for monitoring and reporting emissions associated with the sale of their products.

EU ETS2 has been designed as a key instrument to help the European Union meet its medium- and long-term climate goals. Its primary objective is to reduce greenhouse gas emissions in sectors not previously covered by the EU emissions trading system and to introduce a carbon price on fossil fuels used in those sectors. Beyond emissions reduction, EU ETS2 enhances the coherence of European climate policy by extending carbon pricing to all emitting sectors, accelerating the energy transition, and fostering technological innovation.

However, since the introduction of a CO_2 price in these sectors will increase the cost of fossil fuel use, the measures may disproportionately affect vulnerable households and micro-enterprises, which spend a significant share of their income on energy and transport. To mitigate these impacts and ensure a just transition, the European Union has adopted Regulation (EU) 2023/955 establishing the Social Climate Fund. Covering the period from 2026 to 2032, the fund aims to support Member States in implementing targeted measures to protect the most vulnerable populations—primarily through investments in energy efficiency, building decarbonization, and sustainable mobility.

In this context, each Member State is required to develop a National Social Climate Plan that reflects the specific challenges of its territory and ensures a fair ecological transition. These plans align with the core principles of European climate policy and aim to mitigate the socio-economic

impacts of the green transition, ensuring that it remains accessible to all segments of the population.

National plans include targeted measures and investments for vulnerable households and micro-enterprises most affected by rising energy costs. These measures encompass a broad range of actions, such as energy-efficient building renovations, the integration of renewable energy sources, and improved access to clean transport.

By combining climate action with social protection, the European Union seeks to ensure that the ecological transition benefits all citizens—enhancing quality of life while reducing social inequalities.

However, a socially just climate policy cannot rely solely on technical or economic interventions. It must be embedded within a broader vision of social justice that considers all dimensions of citizens' living conditions.

Luxembourg's specific Situation

Luxembourg faces a distinctive set of challenges in its ecological transition, shaped by its geographical, demographic, and economic characteristics. As a highly urbanised country undergoing sustained urban sprawl, it has developed a strong dependence on private vehicles, which in turn intensifies pressure on the housing market. Rapid population growth—driven by the country's economic appeal and the daily influx of cross-border workers—has created significant challenges in housing, transport infrastructure, and land-use planning. Between 2009 and 2025, the population increased from 493,500 to 681,973.

Fuel consumption in Luxembourg is disproportionately high compared to neighbouring countries, accounting for approximately two-thirds of total final energy consumption. This anomaly is largely due to Luxembourg's central location in Europe and the price differentials in fuel compared to surrounding nations.

The housing sector has been under sustained pressure for years. High demand coupled with limited supply has led to soaring property prices for over two decades. The continued rise in prices and rents—particularly in the private market—has made housing increasingly inaccessible for a large share of the population. These costs do not affect all residents equally and risk excluding vulnerable groups. The burden falls especially heavily on low-income households renting privately, who often face multiple, compounding housing-related difficulties. In response, successive governments have implemented policies aimed at increasing the supply of affordable housing, offering individual assistance for home ownership, and improving the energy efficiency of buildings.

In this context, the inclusion of greenhouse gas emissions from the building and road transport sectors within the scope of the EU ETS2 represents a significant challenge, particularly for vulnerable households and small businesses. The internalisation of carbon costs through the expansion of the carbon market to these sectors risks generating differentiated socio-economic impacts, placing a heavier burden on certain population groups and categories of economic actors. Among the anticipated effects is a rise in the prices of gas, heating oil, petrol, and diesel, which could disproportionately affect vulnerable households, as they allocate a relatively larger share of their budget to heating and transport expenses. Consequently, the increase in the price of CO_2 will have a regressive effect on these households and microenterprises[1]. Energy poverty is likely to

[1] Sologon, D. M., O'Donoghue, C., Kyzyma, I., Loughrey, J., & Linden, J. (2025). Distributional Impact of Soaring Prices in Europe: A Cross-National Decomposition of Inflation's Regressivity and Progressivity. Review of Income and Wealth.

worsen, especially for tenants living in older or poorly insulated buildings and for homeowners lacking the financial resources to undertake energy renovation works. At the same time, households located outside major urban centres—particularly in peri-urban and rural areas, where public transport options are more limited—will be more exposed to rising transport costs.

Structurally, the transition to a decarbonised housing stock poses major challenges for low-income owner-occupiers, who may struggle to fund renovations or replace fossil fuel heating systems. Vulnerable tenants are similarly affected, as they often reside in inefficient buildings and depend on landlords to invest in upgrades. Micro-enterprises—such as craftsmen, delivery drivers, and construction professionals—play a vital role in the local economy and typically rely on combustion engine vehicles. The introduction of a carbon price under EU ETS2 could increase their operating costs, particularly fuel expenses. However, this shift may also serve as a catalyst for innovation and equipment modernisation, provided it is supported by targeted assistance measures.

Recognising these challenges, Luxembourg has addressed them in its Social Climate Plan, developed in accordance with Regulation (EU) 2023/955. The plan aims to ensure a fair and inclusive energy transition by mitigating the social impact of the new regulatory framework.

Gender inequalities and social issues

Gender inequality remains a significant concern across various domains, particularly in climate, energy, housing, and mobility policies. A recent project conducted by the Luxembourg Institute for Socio-Economic Research (LISER)—as part of the *INGINCO: Gender Inequality, Inflation and Consumption*[2] initiative commissioned by the Ministry for Gender Equality and Diversity (MEGA) and building on the earlier study *Price Increases and Gender Inequality* for the Ministry of Environment, Climate and Biodiversity (MECB) —has highlighted several specific vulnerabilities.

The research reveals pronounced gender disparities in the housing sector, notably a disproportionate financial burden borne by women. Family composition plays a critical role: in 2023, 85.3% of single-parent households with children in Luxembourg were headed by women[3]. These families have historically been among the most vulnerable in the housing market, spending a significantly higher share of their income on housing-related expenses. Moreover, the effort rate—the proportion of income allocated to housing—is rising more rapidly for women than for men across all income quintiles, except the second. This trend underscores a deepening of gender inequalities in access to housing. Women also face slightly greater challenges in securing quality housing, with higher exposure to issues such as dampness, poor insulation, and inadequate thermal comfort. These disparities reflect persistent income gaps, unequal distribution of caregiving responsibilities, and structural barriers to accessing credit. In response, the study recommends that housing support policies be more effectively targeted, considering gender-specific needs and family circumstances. These efforts should be complemented by broader measures to address wage inequality and promote stable, high-quality employment opportunities for women.

Mobility-related disparities are partly rooted in differences in transport usage patterns. Women are more likely to make combined or fragmented journeys, often linked to domestic and caregiving responsibilities. These patterns are compounded by safety concerns, which remain insufficiently addressed in transport systems historically designed around linear commuting. Together, these

[2] Peluso, E., Islam, N., Leduc, K., Lorentz, N., Menta, G., Sologon, D. M., Van Kerm, P., Verheyden, B., Depireux, A., Genevois, A.-S., Segura, J., & Bouvy, I. (2024). Hausse des prix et inégalités de genre au Luxembourg : Etude du LISER sur le projet INGINCO en collaboration avec le MEGA. (Les rapports du LISER). LISER.

[3] Leduc, K., Paccoud, A., & Lorentz, N. (2022). Évolution du taux d'effort des ménages résidant au Luxembourg selon leur composition familiale entre 2016 et 2019. Ministère du Logement - Observatoire de l'Habitat https://logement.public.lu/fr/observatoire-habitat/publications.html

factors contribute to a greater reliance on private vehicles. The study underscores that the shift toward more sustainable modes of transport requires more than awareness campaigns—it depends on the creation of a supportive and inclusive environment. To be effective, such efforts must be backed by concrete measures: improved accessibility and scheduling, enhanced safety, equitable pricing, and targeted support in underserved areas. Local authorities have a pivotal role to play, particularly through flexible transport solutions such as on-demand services, which are better aligned with local realities and the diverse needs of users.

CO_2 Tax in Luxembourg

Since 2021, Luxembourg has applied a CO_2 tax on fossil fuels to encourage a gradual reduction in their consumption. This tax is embedded in the amended law of 17 December 2010, which governs excise duties and similar levies on energy products. Initially set at €20 per tonne of CO_2 emitted—aligned with average carbon prices in neighbouring countries—the tax has increased annually by €5 per tonne, reaching €40/t CO_2 in 2025, with a target of €45/t in 2026.

In line with the National Integrated Energy and Climate Plan (NECP), revenue from the CO_2 tax is allocated in a balanced manner. Half is earmarked for climate protection and energy transition initiatives, including subsidies for energy-efficient renovations, electromobility, and renewable energy deployment. The remaining half is directed toward social compensation measures—such as the CO_2 tax credit and cost-of-living benefit—to support vulnerable households and ensure a fair and inclusive transition.

To ensure rigorous oversight, the Interministerial Committee for Climate Action closely monitors the implementation of the CO_2 tax, particularly its effectiveness in meeting sectoral climate objectives. The committee submits quarterly reports to the Government Council, drawing on the work of a technical group composed of STATEC, the Customs and Excise Administration, and the relevant ministries (MFIN, MECB, and MECO). This group collects and analyses data to anticipate regional developments and inform potential revisions to the fiscal trajectory.

Should the analysis indicate that fuel price differentials with neighbouring regions are undermining the trajectory of fuel sales aligned with climate and energy goals, additional tax adjustments will be introduced.

The provisions governing the evolution of the CO_2 tax for the period 2027–2030 are scheduled for reassessment in 2026. This review will consider both national climate targets and measures adopted by neighbouring countries, particularly considering the introduction of the EU ETS2. Such measures may influence fuel price disparities between Luxembourg and adjacent regions, with implications for domestic consumption and sales.

Under EU regulations, Member States may exempt entities covered by the extended emissions trading system, provided those entities are subject to a national carbon tax that is equal to or exceeds the price set by EU ETS2.

Regardless of the final decision on Luxembourg's participation in the EU ETS2, the government remains committed to protecting vulnerable households and micro-enterprises from potential increases in energy costs. It therefore guarantees that any form of carbon taxation—whether direct (such as a CO_2 tax) or indirect (via market-based mechanisms)—will be accompanied by appropriate social compensation measures.

Governance

This preliminary draft is the result of close collaboration between the Ministry of the Environment, Climate and Biodiversity (MECB), the Ministry of the Economy (MECO), and the Ministry of Family Affairs, Solidarity, Living Together and Reception of Refugees (MFSVA), in partnership with Klima-Agence and the Ministry of Finance (MFIN). Under the supervision of the Ministry of the Environment, Climate and Biodiversity, this joint effort has led to the development of a comprehensive set of measures and investments supporting both climate and social transition. Contributions from the ministries represented in the Interministerial Committee for Climate Action have further ensured a coordinated, cross-sectoral approach.

In addition, a dedicated working group supported the analyses conducted by STATEC, particularly in assessing the overall impact of the proposed measures. This methodology is designed to provide a robust understanding of the plan's socio-economic and environmental effects, grounded in empirical data and rigorous analytical frameworks.

1.1.2. Objectives of the measures and investments

The planned measures and investments are guided by a central objective: to ensure a socially equitable climate transition that is accessible to the entire population. Special attention is given to vulnerable households and individuals with limited access to transport, as they often face greater challenges in participating in transition initiatives.

In many cases, climate policies tend to primarily benefit homeowners who possess investment capital. Without corrective mechanisms, this dynamic can reinforce existing structural inequalities. To address this issue, the plan introduces a series of instruments aimed at expanding access to transition measures. These instruments are designed to reduce financial, administrative, and informational barriers for those most affected by energy and transport insecurity.

The logic behind these interventions is based on three key strategies. First, public support will be adjusted according to the financial resources available to each household. Second, innovative financing mechanisms will be developed to match the contributory capacities of different population groups. Third, stronger incentives will be introduced to encourage the rental of renovated buildings within a regulated framework that promotes social inclusion.

To ensure the consistency and effectiveness of these actions, the establishment of a structured and transparent system for monitoring energy poverty is considered essential. Reliable indicators are necessary to evaluate the impact of implemented policies, anticipate potential negative effects, and make timely adjustments when needed.

The importance of such monitoring was strongly emphasized during the consultation process conducted as part of the development of the Social Climate Plan. Many participants highlighted the need for a transparent, accessible, and responsive system to measure the social effects of climate policies. This monitoring system must be fully integrated into the implementation of the Social Climate Plan and serve as a key instrument for policy steering, accountability, and real-time adjustment. Furthermore, the monitoring mechanism will contribute to greater transparency in the design and justification of subsidy programms. By providing objective and continuous data, it will enable more accurate targeting of needs, facilitate the evaluation of existing measures, and ensure that public aid is based on verifiable and equitable criteria.

1.2. Overview of current policy landscape

Current policies include measures from the NECP, the government programme, and initiatives under the responsibility of the MFSVA. These policies are financed exclusively through the Luxembourg State's own resources and are not supported by the European Social Climate Fund. For clarity and ease of reference, the following measures are presented by sector.

Building Sector

- Just Transition Fund (No.1)
- Update of the long-term building renovation strategy (No.2)
- *Klimabonus Wunnen* Subsidy programm (N°3)
- Pre-Financing under the *Klimabonus Wunnen* subsidy programm (No.4)
- Pre-Financing of photovoltaic installations (No.5)
- Pre-Financing of the 'Topup Social' energy efficiency improvement grant (No.6)
- Individual housing assistance for energy efficiency improvements (No.7)
- Overhaul of the Climate Loans (No.8)
- Establishment of a national entity supporting energy renovation, Decarbonization, and photovoltaic installation in residential buildings (No.9)
- Upscaling of the *Zesumme renovéieren* pilot project in Differdange (No.10)
- Energy renovation of vacant dwellings (No.11)
- State aid for the energy renovation of functional buildings (No.12)
- Facilitation of energy-related work in co-owned buildings (No.13)
- Study on the rental challenges of the energy transition (No.14)
- Financial contributions to the construction of affordable rental and sale housing (*Aides à la pierre*) (No.15)
- Support for the installation of photovoltaic systems on affordable housing (No.16)
- Installation of photovoltaic systems on residential buildings (No.17)
- Social leasing – heat pumps and photovoltaic panels (No.18)
- 'State Energy Community' for sharing renewable electricity with vulnerable households and micro-enterprises (No.19)
- Awareness-raising, information, and advisory services on buildings (No.20)
- Assistance for energy-poor households (No.21)
- Specialised energy advisory service for replacing fossil fuel heating systems with renewable solutions (No.22)
- Strengthening the social dimension of Climate pact (pacte climat) 2.0 with municipalities (No.23)
- Climate pact (pacte climat) for Businesses (SMEs) (*Klimapakt fir Betriber*) – Basic advisory services for vulnerable micro-enterprises (No.24)
- General aid for SMEs – Investment support (No.25)
- Subsidy programm for businesses – Environmental and climate protection (No.26)
- SME Packages-Sustainability (No.27)
- State contribution to electricity network usage costs (No.28)
- Administrative simplification for micro-enterprises (No. 29)
- Zero-interest "Competitiveness and Sustainability Loan" (No. 30)

Building policies are designed to accelerate the energy transition of the national building stock while promoting social equity and addressing energy poverty. The central objective is the gradual decarbonization of the residential sector, primarily through the phased phase-out of fossil fuel heating systems and the widespread promotion of energy-efficient renovation.

Various financial instruments—such as the *Klimabonus Wunnen*, energy efficiency subsidies, interest subsidies, and state guarantees for climate loans—support households in undertaking renovation work. These measures are further reinforced by tax incentives, individual housing assistance, and public investment in the development of affordable housing, both for rental and ownership. It is worth noting that some of these subsidies are currently under review, including the *Klimabonus Wunnen 2026* scheme, which builds upon and extends the existing *Klimabonus Wunnen* programme.

Luxembourg also places strong emphasis on citizen engagement and awareness-raising through targeted information campaigns, advisory services, and technical guidance. Specific measures have been introduced to facilitate energy renovations in co-owned properties, while pilot projects—such as the neighbourhood renovation initiative in Differdange—enable integrated approaches to be tested and refined at the local level.

Furthermore, the development of renewable energy production and self-consumption is actively promoted through a range of initiatives supporting the installation of photovoltaic panels. These include financial support for affordable housing equipment and regulatory frameworks for new buildings. Innovative solutions, such as balcony power stations, complement this strategy by expanding access to decentralized energy generation.

In the medium term, the establishment of a national entity dedicated to assisting citizens with renovation and decarbonization efforts will further strengthen the implementation and coordination of these policies.

Transport sector

- Expansion of publicly accessible charging infrastructure (No.31)
- Right to a charging station (No.32)
- Transport on demand (No.33)
- Awareness-raising, information, and advisory services on mobility (No.34)
- Awareness-raising, information, and advisory for citizens promoting behavioural change and a favourable environment for citizen engagement (No.35)
- *Klimabonus Mobilitéit* – Subsidy programm for zero-emission vehicles (No.36)
- Financial aid for second-hand electric cars (No.37)
- Financial aid for electric bicycles (No.38)
- Financial aid for the installation of private electric vehicle charging station (No.39)
- Free and promoted public transport (No.40)
- Development of car sharing and bike sharing (No.41)
- Social car leasing (No.42)

Current mobility policies pursue multiple objectives, with a focus on ecological transition, social justice, and improved quality of life. Central to these efforts is the reduction of greenhouse gas emissions from the transport sector by promoting sustainable alternatives to private combustion-engine vehicles. Key strategies include the provision of free public transport, the development of active mobility options such as walking and cycling, and the implementation of on-demand transport services like the *Ruffbus*.

At the same time, electrifying Luxembourg's registered vehicle fleet remains a central pillar of the national mobility strategy. To accelerate this transition, subsidy programms have been introduced to support the purchase of zero-CO_2 vehicles and bicycles, as well as the installation of private charging stations.

These efforts are reinforced by the expansion of the public charging network and the establishment of a right to charging stations in condominiums, aimed at removing structural barriers to electric mobility. In parallel, the electrification of public transport is advancing, with a particular focus on modernizing bus fleets and extending the tram network.

Businesses are also called upon to play an active role by developing mobility plans and accessing public subsidies aligned with their climate and environmental commitments.

Together, these measures are designed to foster sustainable structural and behavioural change, bridging the goals of energy transition and social inclusion at the national level.

Direct Income Support

- Social financial compensation for CO_2 tax (No.43)
- CO_2 Tax Credit (crédit d'impôt CO_2 - CI-CO_2) (No.44)
- Regular adaptation of the cost-of-living allowance (No.45)
- Increase in the energy allowance in 2025 (No.46)
- Automatic payment of the cost-of-living allowance and energy allowance to REVIS beneficiaries (No.47)
- Creation of a one-stop social service centre (No.48)

In the context of the climate transition, Luxembourg's direct income support policies are designed to mitigate the socio-economic impacts of environmental measures, particularly for the most vulnerable households. These policies form part of a broader climate justice approach, which seeks to ensure that the shift to a low-carbon economy does not come at the expense of low-income populations.

Key measures include the regular adjustment of the cost-of-living benefit and the increase in the energy allowance as well as the automatic support for recipients of the Social Inclusion Income (REVIS). These initiatives aim to support the vulnerable households in the face of rising energy and commodity prices.

Complementary funding has also been allocated to cover increased energy costs in residential care facilities for the elderly, thereby preserving the financial stability of these essential institutions and maintaining the quality of life for their residents.

At the core of this strategy is the CO_2 Tax Credit (CI-CO_2)—a fiscal instrument designed to offset the financial burden of the CO_2 tax. Introduced in the spirit of fairness, this mechanism redistributes a portion of carbon tax revenues to households, considering their socio-economic circumstances. It serves as a lever for climate solidarity, acknowledging that some households have limited capacity to absorb the costs associated with the energy transition. The CI-CO_2 thus reinforces the social acceptability of carbon pricing, while upholding the 'polluter pays' principle in a progressive and equitable manner.

Together, these measures ensure that the energy transition remains socially just, inclusive, and sustainable, by enhancing the economic resilience of those most affected by climate-related policy changes.

1.3. Public consultation process

In accordance with Regulation (EU) 2023/955 and the relevant national legal framework, the preparation of Luxembourg's Social Climate Plan was accompanied by a structured, multi-phase consultation process. This approach was designed to ensure the early and broad involvement of all relevant stakeholders.

An initial informal consultation phase was launched at the end of March 2025 via an online questionnaire, accessible through the participatory platform www.zesumme-vereinfachen.lu, and remained open until the end of April 2025. The primary objective was to engage a diverse range of actors from the outset and to collect a wide spectrum of field-based insights and perspectives. The questionnaire focused on both the evaluation of existing and planned measures and the collection of suggestions for new initiatives and potential avenues for action. A formal call for contributions was extended to representatives from the social sector, civil society, local authorities, housing associations, trade unions, youth organizations, professional chambers, as well as stakeholders from the research, energy, and transport sectors, and organisations promoting gender equality. In total, 27 organisations submitted contributions, reflecting a strong commitment to participatory policy-making and inclusive climate governance.

The results of the consultation can be summarised as follows:

- Broad consensus on the need for increased financial support.
- Concerns regarding financial accessibility and perceived inequities in access to support measures, particularly affecting tenants.
- Criticism of administrative complexity of the schemes, with existing procedures viewed as lengthy and complex.
- Lack of information and awareness about available support schemes, highlighting the need for more proactive, targeted, and locally anchored communication strategies.
- Demand for simplification and proximity, including proposals for the creation of one-stop shops, automated aid allocation, and neutral, personalised support services.
- Calls for increased accountability among rental property owners, with suggestions for incentives or obligations, such as rent caps for poorly insulated housing.
- A general appeal for inclusive climate justice, emphasising the importance of integrating social equity into climate policies to guarantee a fair transition.

Subsequently, a second and more technical phase of consultation was conducted in June 2025 through bilateral exchanges with key stakeholders. These discussions provided an opportunity to examine specific components of the Social Climate Plan in greater detail and to collect targeted feedback on the proposed measures. Participants included trade union representatives, climate-focused NGOs, social sector organizations, and social housing stakeholders. The exchanges offered a framework for open dialogue, enabling stakeholders to articulate their priorities, share field-based expertise, and propose concrete policy recommendations. They also helped to identify more precisely the barriers faced by target groups, as well as the key levers for action to be prioritized.

Following the approval of the preliminary draft by the Government Council, a formal two-month public consultation is scheduled. This phase will allow for the integration of comments and observations from the general public into the final version of the Plan. In addition, the official opinions of the Platform for Climate Action and Energy Transition and the Climate Policy Observatory will be considered.

1.4. Definitions

The framework of the Social Climate Fund foresees the development of definitions for three target groups, in accordance with the provisions of European Regulation (EU) 2023/955, identified as being particularly affected by the costs associated with the new emissions trading system for buildings and road transport. In this context, definitions have been developed to adapt them to the luxembourgish context. It should be emphasized that these definitions are intended for statistical purposes, aiming to ensure data comparability, without serving as operational targets or setting specific values for every identified measure.

- **Vulnerable Households**

Regulation (EU) 2023/955 of the European Parliament defines 'vulnerable households' as follows: 'households in energy poverty or households, including low income and lower middle-income ones, that are significantly affected by the price impacts of the inclusion of greenhouse gas emissions from buildings within the scope of Directive 2003/87/EC and lack the means to renovate the building they occupy.'

This definition provides a general framework for identifying vulnerable households across Member States. In Luxembourg, identification is based on a nationally developed methodology for measuring and monitoring energy poverty.

Energy poverty is defined differently depending on the economic context. In developing countries, it typically refers to a lack of access to basic energy services. In industrialised countries, by contrast, it is more commonly associated with an excessive financial burden resulting from energy expenditures relative to household income. Luxembourg has established a national indicator to quantify and monitor energy poverty: the combined TEE & BRDE indicator. This tool enables the exclusion of cases involving energy waste or situations where the energy effort rate is deemed acceptable, while also accounting for the level of household poverty. According to this indicator, households are considered to be in energy poverty when they face high energy bills, have low incomes, and reside in poorly performing housing in terms of energy efficiency.

To quantify energy poverty, STATEC (Di Falco, Thunus, and Zardet, 2021[4]) primarily relies on two indicators:

- High Energy Expenditure Ratio (taux d'effort énergétique - TEE)

$$\text{TEE} = \frac{\text{Dépenses énergétiques du ménage}}{\text{Revenu du ménage}} > 2 \times \text{Valeur médiane nationale en 2012}$$

- Low-Income, High-Energy Expenditure (Bas revenue, dépenses élevées - BRDE)

$$\text{BRDE} = \begin{cases} \dfrac{\text{Dépenses énergétiques du ménage}}{\text{par unités de consommation}} > \text{Valeur médiane nationale en 2012} \\ (\text{Revenu net du ménage} - \text{Charges du logement}) < 60\% \times \\ \text{Médian du (Revenu net du ménage} - \text{Charges du logement) en 2012} \end{cases}$$

[4] Di Falco, E., O. Thunus, et G. Zardet (2021). Analyse sur la précarité énergétique au Luxembourg. Working Paper.

The TEE indicator is widely used in scientific literature (Legendre & Ricci, 2015[5]) due to its simplicity in calculation and interpretation. However, it does not account for income levels, which means that households with high energy consumption—regardless of their financial capacity—may be classified as energy poor. In contrast, the BRDE indicator applies a more restrictive approach: it identifies only those households whose income falls below 60% of the median net income (after housing costs) and whose energy expenditure exceeds the national median. In addition to these two objective indicators, two subjective measures of energy poverty are also considered. These are based on household self-reporting and include: (i) the inability to adequately heat the home during winter, and (ii) difficulties in paying energy bills.

Following the methodology developed by Di Falco and her colleagues, STATEC selected 2012 as the reference year. In that year, the national median TEE threshold was 7.2%, meaning that any household spending more than this proportion of its income on energy was in energy poverty. For the BRDE indicator, the median energy expenditure per consumption unit was €1,194 per year, while the low-income threshold, defined as 60% of the median net income after housing costs, was €17,263 per year, or approximately €1,438 per month.

As of 2023, energy poverty affected approximately 4% of households

- **Vulnerable transport users**

Regulation (EU) 2023/955 of the European Parliament defines *vulnerable transport users* as: 'individuals and households in transport poverty, but also individuals and households, including low income and lower middle-income ones, that are significantly affected by the price impacts of the inclusion of greenhouse gas emissions from road transport within the scope of Directive 2003/87/EC and lack the means to purchase zero- and low-emission vehicles or to switch to alternative sustainable modes of transport, including public transport..'

- **Vulnerable micro-enterprises**

The Commission Recommendation of 6 May 2003 on the definition of micro, small, and medium-sized enterprises classifies a micro-enterprise as a business that employs fewer than 10 persons and has an annual turnover or balance sheet total not exceeding EUR 2 million.
According to Regulation (EU) 2023/955 establishing the Social Climate Fund, *vulnerable micro-enterprises* are defined as: 'micro-enterprises that are significantly affected by the price impacts of the inclusion of greenhouse gas emissions from buildings or road transport within the scope of Directive 2003/87/EC and that, for the purpose of their activity, lack the means either to renovate the building they occupy, or to purchase zero- and low-emission vehicles or to switch to alternative sustainable modes of transport, including public transport, as relevant .' This definition establishes the relevant context, but it does not provide sufficient criteria to clearly distinguish these enterprises from others.

To identify a measurable indicator for reaching vulnerable micro-enterprises—while respecting the definition provided in Regulation (EU) 2023/955—it is appropriate to examine the subsidy programms implemented in Luxembourg for businesses particularly affected by rising energy prices following Russia's aggression against Ukraine. These schemes, which remained in effect until mid-2024, established a clear link between energy consumption, incurred costs, and the financial situation of the affected enterprises. A similar logic applies to the anticipated impact of price increases resulting from the extension of the emissions trading scheme to the building and road transport sectors under Directive 2003/87/EC (hereinafter referred to as ETS2). The indicators used to target businesses under previous energy-related subsidy programms will also serve as relevant

[5] Legendre, B., & O. Ricci. (2015). Measuring fuel poverty in France: Which households are the most fuel vulnerable? Energy Economics 49: 620-628.

vulnerability indicators in this context. Accordingly, a vulnerable micro-enterprise is defined as a *micro-enterprise that is a large energy consumer*—specifically, one whose energy costs account for at least 3% of its annual turnover.

Such enterprises are considered vulnerable due to their high energy consumption relative to their size and their resulting dependence on fossil energy sources, which remains largely unavoidable at present. This analytical approach aligns closely with the principles underpinning the Social Climate Plan, serving the interests of businesses, their employees, and the broader (social) economy in Luxembourg. The measures proposed are designed to shield vulnerable micro-enterprises from the expected price increases under ETS2. They focus on both raising awareness and providing targeted support in the areas of building renovation and transport. Regarding eligible costs, only fossil fuels—such as natural gas, fuel oil, and diesel—will be considered.

2. DESCRIPTION OF MEASURES, INVESTMENTS, INTERMEDIATE VALUES, AND FINAL OBJECTIVES

2.1. Component C1 – building sector

The building sector is a key lever for achieving climate objectives while promoting social justice. According to the final greenhouse gas emissions report for 2023, it accounts for 20.1% of total emissions. [6]

Several cross-cutting priority areas must be identified to ensure an integrated, inclusive, and responsive approach to energy and social challenges.

First and foremost, the systematic integration of social impacts into the development of climate policy measures is essential. Energy renovation policies should reflect the socio-economic realities of vulnerable households and micro-enterprises with limited resources, to ensure both fairness and effectiveness. This entails not only the precise targeting of financial aid, but also the adaptation of support mechanisms—particularly for vulnerable groups, including tenants and resource-constrained micro-enterprises.

At the same time, support for infrastructure projects in the building sector—including collective energy renovations, sustainable social housing initiatives, and the installation of renewable energy at the local level—must be reinforced. These initiatives, often driven by local or community dynamics, enable the pooling of resources, reduce costs for households, and optimize environmental impact. They also contribute to improving quality of life, combating energy poverty, and strengthening social cohesion within neighbourhoods.

The immediate urban environment of buildings—streets, squares, and public spaces—plays a central role in fostering a sustainable and socially equitable living environment. These spaces should be upgraded as areas of proximity, social connection, and shared well-being, particularly in disadvantaged neighbourhoods where green spaces are scarce or housing suffers from poor comfort and energy performance. Such areas, marked by overlapping social and environmental vulnerabilities, require targeted attention in transition policies.

Rethinking public spaces through the lens of social and climate justice is therefore a vital lever for driving an inclusive ecological transition.

[6] Publication du bilan définitif des émissions de gaz à effet de serre de l'année 2023 (AEV)
https://environnement.public.lu/fr/actualites/2025/mars-2025/bilan-gaz-effet-serre-2025.html?utm_source=chatgpt.com