



COUNTRY REPORT

IDENTIFYING THE VULNERABILITIES TO THE ETS 2 IN ROMANIA

POLICY RECOMMENDATIONS FOR THE ADOPTION OF THE NATIONAL
SOCIAL CLIMATE PLANS

AUTHORS: ANDREEA VORNICU-CHIRA, ANCA SINEA, MELANIA LESE, GEORGE JIGLĂU





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Abbreviations List

- EP: Energy Poverty
- HBS: Household Budget Survey
- 2M: Double the Median
- M/2: Half the Median
- LIHC: Low Income High Cost
- OSS: One Stop Shop
- SCP: Social Climate Plan

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1. Introduction

1.1 Objectives and scope

The European climate ambitions, while necessary and designed to change the socio-economic landscape of the Member States' societies, entail greater social costs significantly impacting lower-income citizens. The introduction of EU ETS 2 will have a regressive effect especially on the lower to middle income households, but also implies a direct financial participation of the entire society citizen in transitioning to greener energy sources and achieving climate goals. Therefore, this report aims to firstly identify patterns of energy and transport vulnerabilities and then assess how the implementation of ETS 2 will impact the Romanian households' welfare. It explores the issues of energy and subsidiary transportation poverty, introducing metrics for their assessment. Based on these metrics, the report identifies the most vulnerable groups and proposes targeted measures to be included in the national Social Climate Plans. Moreover, the report offers recommendations for policymakers tasked with enacting these EU directives in Romania, drawing on insights from extensive expert consultations.

1.2 Executive summary

Carbon pricing mechanisms are necessary instruments for the transition to greener societies. ETS 2, designed as a component of the Fit for 55 package, foresees a new emission trading system for buildings and road transport fuels. The package, adopted by the European Parliament, will become operational across all Member States in 2027.

While important in reducing the emissions associated with the process of heating the buildings and the road transport, ETS 2 is expected to have a regressive effect and impact especially the vulnerable households.

As a means to tackle the regressive effect of ETS 2, the European Commission has adopted the Social Climate Fund, which aims to provide dedicated funds to the Member States for addressing households in energy and transport poverty.



Romania will be the one of the largest recipients of the Social Climate Fund which translates into considerable opportunities to address the regressive effects of carbon pricing and develop targeted measures for the impacted households.

In this context, this report has three important objectives: a. to explore and identify the various patterns of energy and transport poverty; b. To assess the impact of ETS 2 on household expenditures and income and c. to propose tailored solutions that have been identified during several consultations processes and can be used by various stakeholders (from national to local authorities and other relevant actors).

Using both quantitative and qualitative analysis, the report offers a comprehensive image of the energy poverty manifestations across Romania, proposes indicators for assessing transport poverty and identifies a set of recommendations for designing and implementing the national Social Climate Plan.

One of the main findings indicates that, in Romania, not only households that use gas for heating will be affected by the ETS 2 mechanism, but indirectly also the income poor households that use wood. As the previous energy crisis showed, the wood price spiked alongside the gas and electricity prices, putting a lot of financial pressure on the low-income households to secure their energy needs.

1.3 Overview of the methodology

This study uses both quantitative and qualitative analysis and has two core components. The first part identifies the patterns of vulnerability, assessing the impact of ETS 2 on Romanian households, and the second part explores the potential approaches and the institutional architecture needed for successfully implementing the Social Climate Fund and addressing the regressive effects of carbon pricing.

The first part of the analysis aimed to explore patterns of energy and transport poverty, using Household Budget Survey data from 2020, 2021 and 2022. Moreover, an important discussion on energy poverty manifestations resides from analyzing the EU-SILC data (the self-reported indicators). Through this quantitative approach the following set of indicators are computed:

- 2M - the percentage of households spending more than double the national median on energy bills.



- M/2 - the percentage of households spending less than half on energy bills than the national median (the so called “hidden energy poverty” indicator)
- LIHC (Low Income High Cost) - the percentage of households falling below the poverty line¹ after paying the energy bills and spending more than the national median on the bills.
- 10% - the percentage of households spending more than 10% of their income² on energy bills.

Data from HBS was used to calculate these indicators. As an important step in the process of computing the indicators, the analysis took in consideration the households’ disposable income³, the households’ expenditure on energy and households’ total expenditures. All these variables have been equivalized⁴ based on the OECD formula that accounts for the household structure⁵. Complementary, the analysis offers an overview of the EU-SILC indicators, the so-called self-reported indicators, as they are based on respondents’ perceptions on heating the household, the existing energy needs and other connex factors.

As a next step in the analysis process, the energy poverty indicators were distributed across income deciles and across places of residence (urban and rural). Moreover, in a deeper analysis, crosstabulations were conducted across energy poverty indicators and heating systems.

General trends have been observed for 2020, 2021 and 2022. The decision to focus on these three years had two important reasons: a. These years were exceptional by themselves (lockdown, energy crisis and Russian invasion in Ukraine) and impacted the households in a different manner; and b. Both patterns of energy consumption and income may change across these years which then reflect in the energy poverty indicators. Therefore, more nuanced conclusions can be drawn from looking at trends and how values change across different socio-political events.

¹The official poverty line is a threshold established at 60% of the median disposable income per equivalized adult.

²Calculated on disposable income.

³The households’ disposable income represents the sum of all the net incomes (the income of a household after the taxes were paid).

⁴Equivalised income is computed by dividing the household's total income by its equivalent size, determined using the OECD equivalence scale. This assigns weights to household members: 1.0 for the first adult, 0.5 for subsequent adults, and 0.3 for each child under 14. Equivalent size is the sum of these weights.

⁵Eurostat Glossary: Equivalised income. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Equivalised_income



Identifying the group of households highly exposed to increased energy prices or with big energy consumptions was a cornerstone for the next step of the analysis which involved calculating the impact of ETS 2 on households' welfare. Based on the gas expenditures, as this fuel used for heating will fall under the incidence of ETS 2, the related CO₂ emission was calculated, using the average price and the emission factor⁶. The average price was the one published by Eurostat and the corresponding emission factor was withdrawn from the website of the German Federal Ministry of Environment and Economic Affairs.

To calculate the additional expenses that will add to the households' expenditures, resulting from the implementation of the EU ETS 2, it was assumed that all costs associated with the new carbon pricing would be fully transferred on to households and there are no other behavioral interventions. The price of allowances was assumed to be €70 per ton of CO₂. The results were presented in relation to expenditures and disposable income of the households and in relation to the income groups. The data used for this step of analysis was the same, the HBS from 2020, 2021 and 2022.

For transport poverty, a set of similar indicators were considered (2M, M/2, LIHC and 10%). For calculating the impact of ETS 2, a similar methodology was followed. However, there were specific challenges in analyzing the transport data and computing these indicators. A specific subchapter is dedicated to the transport vulnerabilities in Romania.

The second part of the analysis is based on a focus group discussion organized with Romanian experts on energy poverty, social affairs, energy efficiency in buildings and policy design. After the data collected through this focus group, another round of comprehensive consultations was organized under the format of World Cafe. In the second round of consultations the pool of experts was larger and their profile complementary to the subject, including representatives of the energy suppliers and producers, energy and transport poverty experts, financial and energy efficiency in buildings experts. From both processes of consultations, more than 30 people actively participated in discussions, offering their knowledge and suggestions on how to identify the vulnerable households and prepare state institutions for implementing both ETS 2 and the Social Climate Fund.

⁶The entire methodology for calculating the impact of ETS 2 on households' welfare can be found in the report Eden et al., (2023), *Putting the ETS 2 and Social Climate Fund to Work: Impacts, Considerations, and Opportunities for European Member States.*, (p. 68, section 6.6). Available at: <https://www.euki.de/wp-content/uploads/2023/10/Policy-Report-Putting-the-ETS-2-and-Social-Climate-Fund-to-Work.pdf>



There were 9 experts who participated at the focus group discussions. The main topics approached included the social impact of ETS 2 in Romania, the political feasibility of implementing this scheme, the needed administrative infrastructure for both implementing ETS 2 and the Social Climate Fund and potential solutions for addressing the identified structural challenges (limited administrative capacity, reduced cooperation among state institutions, reduced access to complex data for mapping better the vulnerable households). While the discussion was guided by some structured questions, free interventions were encouraged for a better exploration of the existing challenges and potential solutions.

During the second round of consultations, organized under the structure of a World Cafe, there were four thematic rounds of discussions that focused on: the implementation of ETS 2 and SCF, the energy efficiency in buildings, the energy market, and the social measures for addressing energy poverty. While all discussions converged towards the mechanisms of identifying the vulnerable households and exploring solutions for better implementing the SCF, the experts were invited to think on these aspects from various angles. As coordinating questions and topics, the experts discussed topics related to processes, procedures and actors needed for better mapping the vulnerable households and for implementing structural programmes, such as the Climate Fund. One important focus was on identifying solutions that will be addressed in this report and included in the recommendation section.

2. European Climate Policies - Short overview and national implications

Officially adopted on 30 June 2021, Regulation (EU) 2021/1119⁷, which acts as the fundamental European climate law, is a pivotal legislative document that transposes in binding targets the objectives listed in the European Green Deal. Therefore, member states have to steer their economies and societies towards climate neutrality by 2050. The law also establishes an interim target, mandating a reduction of net greenhouse gas emissions by at least 55% by 2030, in contrast to 1990 levels. For achieving both the 2030 interim target and the 2050 goal, member states need to adopt cross-sectoral strategies, including investments in green

⁷ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999, available at: <https://eur-lex.europa.eu/eli/reg/2021/1119/oj>.



technologies and energy efficiency, emissions reduction policies and targeted measures for protecting the natural environment. Moreover, as changes encompass all societal layers, a special focus is given to social equity and the mechanisms which can support a just transition process.

As a support mechanism, for achieving the targets announced in the European Climate Law, the European Commission developed the "Fit for 55"⁸ package⁹. Introduced in July 2021, the package includes a comprehensive plan to achieve the reduction of net greenhouse gas emissions by at least 55% by 2030. After the Russian invasion in Ukraine, the European Commission broadened its ambitions and adopted the REPowerEU plan which aims to increase the energy efficiency and renewable goals and diversify its energy resources and achieve energy security. Moreover, central to the "Fit for 55" package stands the reform of carbon pricing and emissions regulation, underscoring the principle of "polluter pays" while generating revenue streams for Member States that can be channeled into green transition reforms.

As such, the "Fit for 55" package extends the carbon pricing mechanisms to new economic sectors, notably transport, heating fuels, and shipping, thereby bolstering emissions reduction efforts. The extension of the ETS mechanism (the ETS 2) to the fuels used for heating the buildings and for road transport will be implemented across all EU societies. Importantly, Member States are mandated to allocate their emission trading revenues towards climate and energy-related initiatives, alongside provisions for addressing the social dimensions of the transition. In addition, the National Energy and Climate Plans need to be readjusted for achieving the new climate targets. Romania is now in an extensive process of consultations with the civil society and academia for including objectives and measures that are aligned with the EU goals.

To address the regressive effects of the ETS 2, the Fit for 55 package established the Social Climate Fund, endowed with €65 billion from the EU budget and over €86

⁸Fit for 55: Delivering on the proposals. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal/fit-55-delivering-proposals_en

⁹The Fit for 55 package includes: the reform of the ETS 1, the introduction of the ETS 2 on the fuel used for heating the buildings and the road transport, the introduction of the Social Climate Fund, the CO₂ emissions standards for cars and vans, the Regulation on Land use, Forestry and Agriculture, the Carbon Border Adjustment Mechanism, the Renewable Energy Directive, the Energy Efficiency Directive, the reform of Aviation and Maritime Regulations, the Energy Performance of Buildings directive and new regulations on the future of methane and hydrogen.



billion in total, for supporting the vulnerable citizens and small businesses in navigating the green transition. According to the methodology of establishing the budget and the financial allocations per member states¹⁰, Romania, in absolute numbers, will be the sixth largest recipient of funds. Therefore, it is a great opportunity for better identifying the households most affected by the ETS 2 and tailor measures that can mitigate the regressive effect of carbon pricing, while enhancing the climate strategies and implementing green programmes.

2.1 Short overview of ETS 2 and its functioning mechanism

One of the 2023 revisions of the ETS Directive includes the development of the ETS 2 system, which will be implemented from 2027 and will apply to the fuel used for heating the buildings, for road transport and other sectors uncovered by the existing ETS (mainly small industry). Being designed under the same principles of EU ETS (implemented since 2005), it will run under the mechanism of “cap and trade”¹¹: there will be a cap on the total emissions of CO₂ and based on this cap, companies (fuel suppliers in the case of ETS 2) can buy allowances and /or resell them on the market. To achieve climate ambitions and send strong signals on the market, the number of allowances issued on the market will be reduced¹². The end consumers, such as households and car users, will not be directly involved in this market scheme of buying allowances, but they will pay the final price which will be increased once the system becomes operational.

Designed as core component of the Fit for 55 package, the ETS 2 aims to bring down the CO₂ emissions by 42% in comparison to the 2005 levels¹³. When ETS 2 will become operational, in 2027¹⁴, the cost of CO₂ per ton will be set at €45. However, the price might fluctuate in the next few years, based on the market principles. Moreover, additional allowances may be released under the market stability reserve mechanism if the fuel prices are excessive or if the price of allowances increases rapidly, similarly to the existing ETS system.

¹⁰Annex I to the EU Parliament and Council Regulation 2023/955 of 10 May 2023 on the establishment of the Social Climate Fund. Available at: <http://data.europa.eu/eli/reg/2023/955/oj>

¹¹ Verde and Borghesi, “*The International Dimension of the EU Emissions Trading System: Bringing the Pieces Together.*” Available at: <https://link.springer.com/article/10.1007/s10640-022-00705-x>

¹²European Commission. Factsheet. “EU Emissions Trading System (ETS). Available at: https://climate.ec.europa.eu/system/files/2016-12/factsheet_ets_en.pdf

¹³European Commission, “*ETS2: Buildings, Road Transport and Additional Sectors.*”. Available at: https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets-2-buildings-road-transport-and-additional-sectors_en.

¹⁴ ETS 2 will be launched the latest in 2028 if the energy prices will be very high in Europe in 2027.



2.2 Short overview of the Social Climate Fund

As a means to tackle the regressive effect of ETS 2, the European Commission established the Social Climate Fund. Basically, Member States will have dedicated financial resources to ensure that the most vulnerable segments, including households dealing with energy poverty manifestations or transport-related challenges, receive direct assistance and are not marginalized amidst the transition to sustainability.

Under this scheme, Member States can utilize the funds to implement structural programmes and investment in energy efficiency measures, building renovations, adoption of clean heating and cooling systems, promotion of renewable energy sources, and the development of zero- and low-emission mobility solutions. Additionally, Member States have the flexibility to allocate a portion of the funds towards temporary direct income support measures. Each Member State will have the obligation to develop a National Social Climate Plan by June 2025 that needs to include a clear mapping of the affected households by ETS 2 and targeted measures for addressing these regressive effects.

According to the SCF regulation, the budget allocation will be made based on a formula that includes the following items: total population, population at risk of poverty living in rural areas, percentage of households at risk of poverty with arrears on their utility bills, GNI per capita measured by the purchasing power standard, overall GHG emissions, and CO₂ emissions from fuel combustion by households¹⁵. Based on this allocation model, Romania will be the sixth largest beneficiary of funds, receiving around 9.25% of the SCF budget. However, in order to get access to these funds, which will be available from 2026, Romania needs to elaborate a National Plan with clear milestones and targets, that indicate pathways for alleviating energy poor households that will be impacted by the ETS 2.

2.2.1 Eligible measures under the Social Climate Fund

As the Social Climate Fund is designed to address the regressive effects of ETS 2 and cushion the vulnerable households¹⁶, there are a set of measures that are eligible and can be implemented by Member States. These measures can be grouped into

¹⁵Eden et al., (2023), *Putting the ETS 2 and Social Climate Fund to Work: Impacts, Considerations, and Opportunities for European Member States*. Available at: <https://www.euki.de/wp-content/uploads/2023/10/Policy-Report-Putting-the-ETS-2-and-Social-Climate-Fund-to-Work.pdf>

¹⁶The Social Climate Fund is designed to mitigate the regressive effect of ETS 2 on the energy poor households, the ones affected by energy and transport vulnerabilities and the micro enterprises.

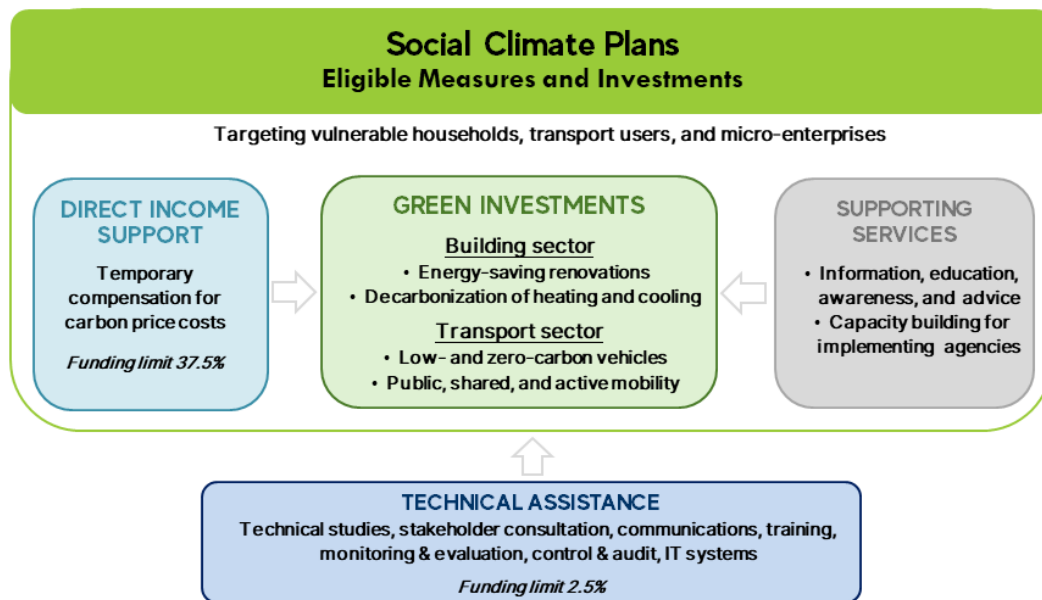


four large categories, as they are also described in *Figure 1*, as follows: temporary direct income support measures, green investments, supporting services and technical assistance. The temporary direct income support can represent up to 37.5% of the total allocation and should address vulnerable households. Having a temporary vocation, this measure can cover only the additional cost to fuel caused by the implementation of ETS 2¹⁷. Temporary support can be issued at the same time as other measures (green investments). The green investments which can be translated

into building retrofitting and decarbonization of the heating and cooling system represent a long-term solution for the vulnerable households, as these solutions respond both to the need of reduced energy consumption and transition to cleaner fuels for heating and cooling. In addition, green investments target the transport sector by promoting public and low-carbon emissions mobility.

The other two measures include technical assistance and support measures.

Figure 1. The scope of potential eligible measures, investments, and supporting activities under the Social Climate Fund



Source: Eden et al., (2023), *Putting the ETS 2 and Social Climate Fund to Work: Impacts, Considerations, and Opportunities for European Member States*¹⁸.

¹⁷Idem, Eden et al., (2023).

¹⁸ Ibidem, (2023) p. 43.



Technical assistance has a budget limit of 2.5% and can be used for specific activities, such as: technical studies, training, expert meetings, communication. The support measures are designed to be used in coordination with the green investments action, as a mechanism of communication, information, and support for both the citizens and the implementing agencies.

3. Identifying patterns of vulnerability and exploring the impact of ETS 2 on Romanian households

Romania is one of the European member states with the highest levels of economic growth and prosperity from Europe from 2010 onwards¹⁹. However, prosperity remained distributed unequally and there are high socio-economic disparities among regions, small and large urban areas and especially among urban and rural areas. Moreover, the existing administrative capacity along with not a very sophisticated labor force and poor connectivity makes the country vulnerable to external crises, as it was the Covid 19 pandemic and the energy crisis. According to official data, in Romania there are more than 7 million households and around 19 million people²⁰ that are impacted by both national policies and international events. At household level, these crises translated into high inflation rates (more than 12% in 2022 and 9.7% in 2023²¹) and a soar in energy prices which reduced the disposable income and led to an increase in energy poverty. Since energy poverty is a complex phenomenon that involves the display of various systemic factors, it is not only the high energy prices that impact the households, but also living in old and thermally inefficient building stock alongside specific patterns of consumption or access to fuels that are equally important to be considered when developing policies.

Looking at the HBS derived indicators (2M, M/2, LIHC and 10%) that assess different manifestations of energy poverty, from 2020 to 2022, it is straightforward that

¹⁹World Bank, *Romania Overview*. 2023. Available at: <https://www.worldbank.org/en/country/romania/overview>.

²⁰National Statistics Institute, 2011. Available at: <https://www.recensamantromania.ro/wp-content/uploads/2021/11/TS2.pdf>

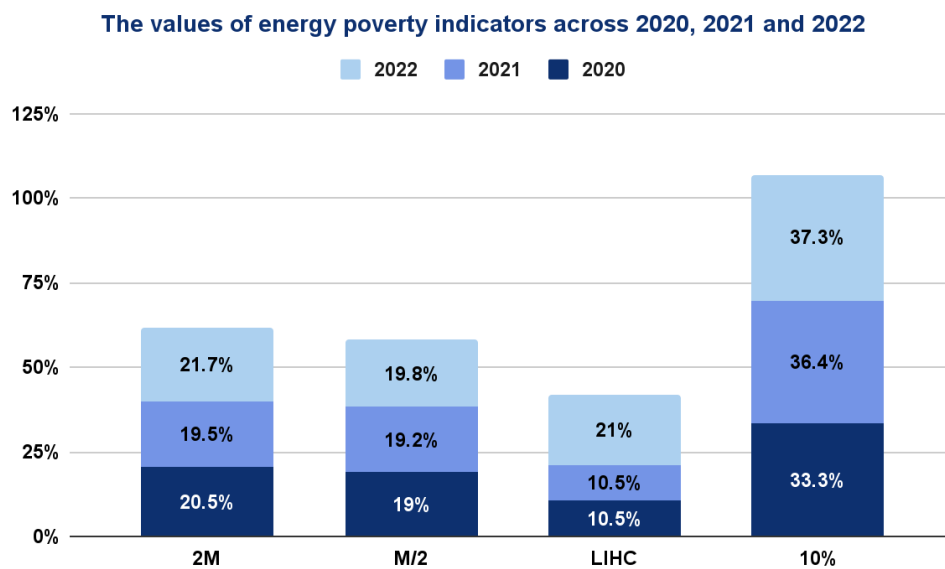
²¹European Commission Factsheet, 2024, Economy and Finance. "Economic Forecast for Romania," n.d. Available at: https://economy-finance.ec.europa.eu/economic-surveillance-eu-economies/romania/economic-forecast-romania_en.



Romanian households are very sensitive to energy price increases or other events. Important to mention here is that all the indicators from *Table 1* are computed based on households' expenses with energy bills and their disposable income. For example, the 10% indicator (the percentage of households spending more than 10% on energy bills) has steadily increased from 33.3% in 2020 to 37.3% in 2022. The LIHC (low-income high cost) indicator, which involves a more nuanced understanding of EP as it evaluates if the household residual income falls below the poverty threshold after paying the energy bills, has doubled its value from 2020 (10.5%) to 2022 (21%), indicating that one in five households is affected by energy poverty.

Moreover, understanding national contexts is equally important in getting a better image of what indicators are illustrating. While 2M is largely used for highlighting the households that are forced to consume more energy for adequate heating or cooling, it can also indicate that some households may have a behavior that leads to increased energy consumption, as Table 4 indicates. While 2M did not increase very much in the last three years, there are still more than one in five households from Romania who spend double the national median on energy bills. On the other hand, M/2, the so called "hidden energy poverty indicator", while it has increased slightly from 19% in 2020 to 19.8% in 2022, indicates that household spend less than half of the national median on energy bills because, most likely, they cannot afford to pay more as next tables indicate.

Table 1. The values of energy poverty indicators across 2020, 2021 and 2022.





Source: The calculations are based on HBS and were conducted by CSD experts.

All in all, at national level, in 2022, based on three indicators (2M, M/2 and LIHC) that assess various manifestations of energy poverty, **one in five households confronted situations that can be characterized as EP**. Moreover, **37% of households paid more than 10% of their disposable income on energy bills**. The values of all these indicators have increased from 2020 onwards.

If it is to look at other datasets that assess energy poverty manifestations, then similar patterns of growing vulnerabilities can be observed. For example, 15% of households declared they could not keep their homes adequately warm in 2022, an increased percentage in comparison to 2020 and 2021 (10% of households). While this indicator is rather subjective, as each household defines the warmth of the home in its own terms and perceptions, the trend is clear and indicates that more households were vulnerable in 2022 in comparison to 2020. Moreover, 17.8% of households declared they had arrears on utility bills in 2022 in comparison to 13.9% in 2020 and 7.3% in 2021. What remained fairly stable is the percentage of households that indicated having a leaking roof, damp walls or other dwelling problems that lead to high or inefficient energy consumption.

Table 2. EU-SILC Energy Poverty indicators and values.

Year	Inability to keep home adequately warm (%)	Arrears on utility bills (%)	Population in dwelling with leaking roof, damp walls, etc. (%)
2020	10%	13.9%	10.9%
2021	10.1%	7.3%	9.4%
2022	15.2%	17.8%	10%

Source: EU-SILC, 2020, 2021, 2022

Following the nexus of “income-expenses” which stand at the ground of measuring the established energy poverty indicators and due to the preexisting state mechanism of social benefits, the measures that address EP fall under the logic of financial aids. The beneficiaries are identified based on their income and rarely include other criteria (retirement status, disability, e.g.). Even though in 2021 the



Parliament adopted a landmark bill (Law 226/2021)²² that defined the vulnerable consumer in a rather comprehensive manner and foresaw financial and non-financial remedies, the implementation of this legal document envisaged only a system of heating benefits. This system works on the premises of income thresholds, where households with lower incomes receive discounts directly on their energy (heating) bills or money for purchasing wood or other solid fuels. These benefits are allocated only for the winter season, from November until March (5 months). After the income threshold was updated and correlated with the minimum wage in 2021, the number of households receiving benefits has more than doubled. As per CSD estimations, in 2022 there were around 788.000 households receiving heating benefits (and a total of 882745 benefits officially recorded). - see Table 3.

Table 3. Number of heating benefits allocated to the households, by type of heating system and fuel used.

Year	Total	District heating	Natural gas	Electricity	Wood, coal or other petrol-based fuel
2020	202.018	25.408	33.765	2.852	139.993
2021	473.325	16.895	22.699	2.789	430.942
2022	882.745	32.583	86.974	6.458	756.730

Source: The Ministry of Labor and Social Solidarity²³

Moreover, as it is presented in Table 3, the largest number of beneficiaries are the ones that use wood or other solid fuels for heating. These numbers correlate with the fact that the highest percentage of households that use wood for heating (80%)²⁴ are located in the rural areas and generally have lower incomes.

The second largest group of beneficiaries are the households that use gas for heating, either individual gas boiler or gas stoves. This group that represents

²²Romanian Parliament, "Law No. 226 of September 16, 2021 on Establishing Social Protection Measures for the Vulnerable Energy Consumer," Monitorul Oficial No. 891 (September 16, 2021). Available at: <https://legislatie.just.ro/Public/DetaliiDocumentAfis/246430>

²³ The Romanian Ministry of Labor and Social Protection <https://mmuncii.ro/j33/index.php/ro/transparenta/statistici/buletin-statistic>

²⁴Sinea et al., (2021), "Energy poverty in the rural context". Policy Brief. Available at: https://www.democracycenter.ro/application/files/5316/2686/1388/energy_poverty_rural.pdf



around 45% of the total households from Romania will be directly impacted by the regressive effect of ETS 2.

The third group of beneficiaries are the households connected to district heating who represent around 11% of the total. Finally, the beneficiaries of electricity benefits are one of the most vulnerable groups. Heating a house with electricity may be very expensive unless heat pumps or other similar technologies are used. The households requiring financial support are rather captive and cannot use other fuels for heating and live in precarious conditions. Isolating these households represents a priority for long term strategies that aim to address aspects related to energy poverty. Even if heating benefits reached less than 3% of the total households from Romania (202.018 households received financial assistance in 2020), in 2022 the percentage quadrupled and 12.6% of the households received a form of heating benefit. This percentage can be explained through the fact that more households qualified and applied for this aid mechanism, within the adoption of the Vulnerable Consumer Law in 2021.

Another important strategy adopted in 2022 in the wake of the energy crisis was the capping price and compensating mechanism²⁵. The compensation scheme was designed as a blanket measure that covered the entire population and provided rebates (gas and electricity) on utility bills. The price cap for electricity involved specific consumption thresholds rewarding with the smallest price the households that consumed less than 100 kWh per month - 0.68 bani per kWh (around €14 cents per kWh) and varied to 80 bani or around €16 cents per kWh. The government issued a cap price mechanism on gas as well. The aim of these measures was to cushion the entire population in the face of high energy prices. However, even with the gas price capped, from 2020 to 2022 the price almost double, putting a lot of pressure on households' disposable income. While shielding the consumer in the face of an energy price spike is usually a wise political decision, extending the intervention to the entire population generated very high costs for the Government²⁶, but did resolve the challenges of energy poor households.

²⁵Cludius et al., "Supporting households in the energy price crisis", Policy brief (2022). Available at: https://democracycenter.ro/application/files/1616/6756/7586/EUKI_Policy_Brief_-_Supporting_Households_in_the_Energy_Price_Crisis.pdf

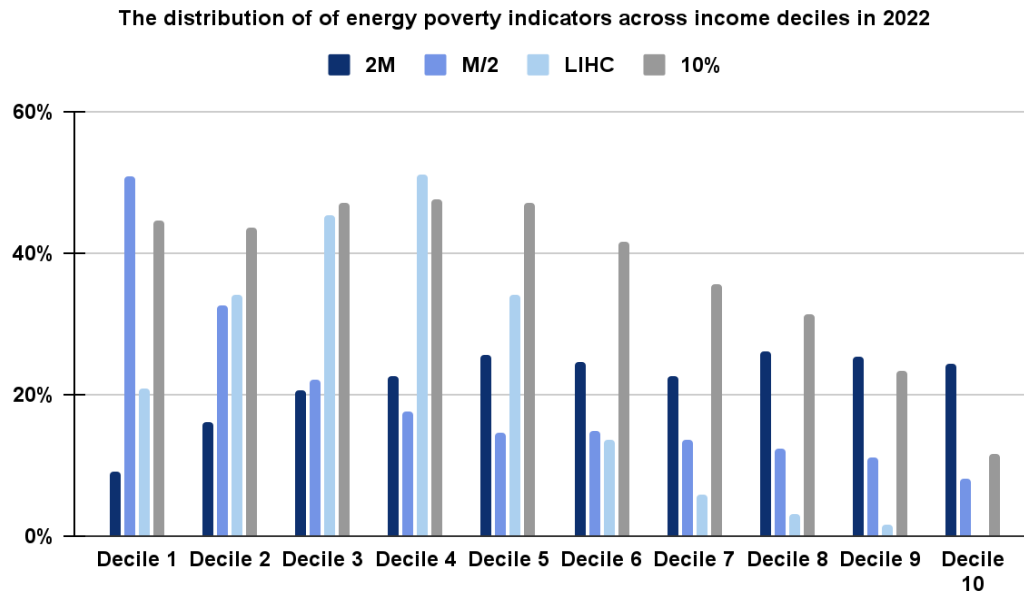
²⁶The cost of these schemes was situated at around 9-10 billion RON for 2023 and are estimated to be around 3 billion for 2024. Source [https://www.economica.net/cat-va-plati-guvernul-pentru-facturile-de-energie-ale-populatiei-ministrul-burduja-a-dezvaluit-costurile-schemei-de-plafonarea-compensare_712994.html]



As data indicate, the percentage of households living in energy poverty has doubled according to the LIHC indicator and increased on all the other measurements presented in this report. On a granular level, looking at the distribution of EP indicators across income deciles, for 2022, households situated from the first to the sixth decile are the most affected by various manifestations of energy poverty. Taking each indicator separately, M/2 registers its highest values in the first income deciles. In other words, the poorest households situated in the first income deciles practice underconsumption, as they cannot afford to pay higher bills and fully satisfy their energy needs. The LIHC indicator has the highest values (between 45% and 50%) across medium income households (the third, the fourth and the fifth income deciles) that use gas for heating and are mainly located in urban areas. In addition, more than 40% of households across various income deciles (from the first to the sixth) spend more than 10% of their income on energy bills.

This indicates, considering the LIHC indicator as well, that energy poverty is not a phenomenon that affects only the income poor households, but permeates medium income households as well.

Table 4. The distribution of energy poverty indicators across income deciles in 2022



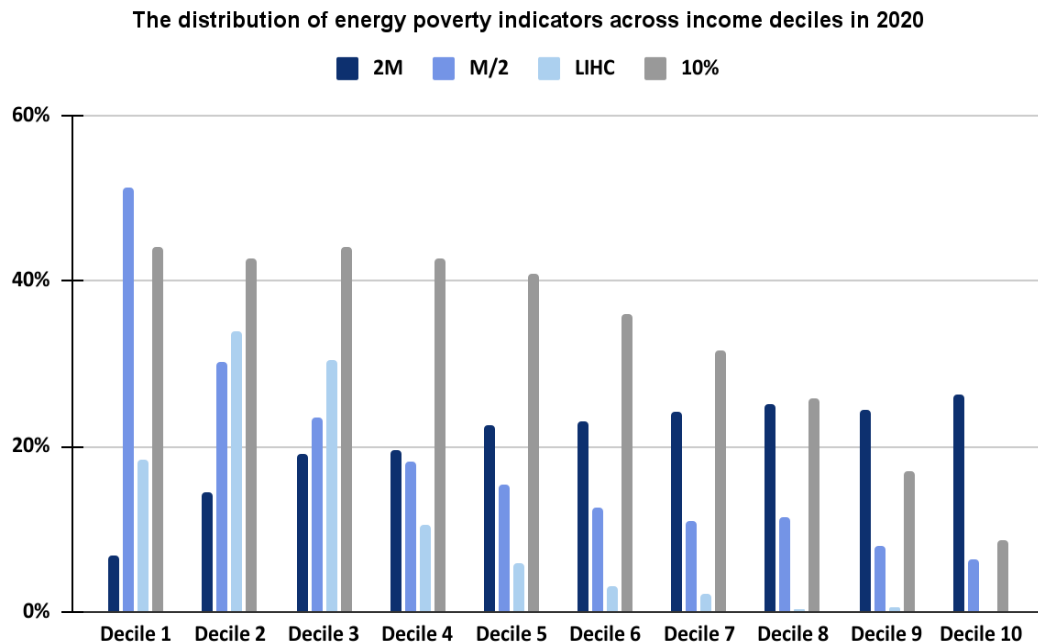
Moreover, this phenomenon can be explained through the fact that living in thermally inefficient buildings, households have to spend more from their disposable incomes on assuring the energy needs. Also, each price increase impacts all households, especially the lower and the medium income cohorts.



If it is to compare with 2020 distribution of energy poverty indicators across income deciles - *Table 5*, there are three important aspects worth mentioning. Firstly, M/2 values and distribution remain fairly similar across income deciles. The first two income groups are the most affected by hidden energy poverty. The 2M indicator has similar values (a slight increase in 2022), but the distribution remains similar. Medium to high income households tend to consume more energy, hence pay higher bills. However, this does not mean that high income households are affected by energy poverty (especially deciles 8, 9 and 10), but they have other patterns of consumption and can afford to pay higher energy bills. Secondly, the LIHC indicator doubled its value, from 10.5% in 2020 to 21% in 2022. If in 2020 the highest values were registered across the first three income deciles, in 2022, households located in the fourth income group register the highest value - 51% (51% of the households from this income group are affected by energy poverty - their residual income falls below the poverty line after paying the energy bills). Lastly, the 10% indicator has a rather steady distribution, but the percentage of households spending more than 10% on their energy bills has steadily increased from 2020.

Therefore, any specific policies should also include the households located in the medium income groups and better explore their vulnerabilities.

Table 5. The distribution of energy poverty indicators across income deciles in 2020



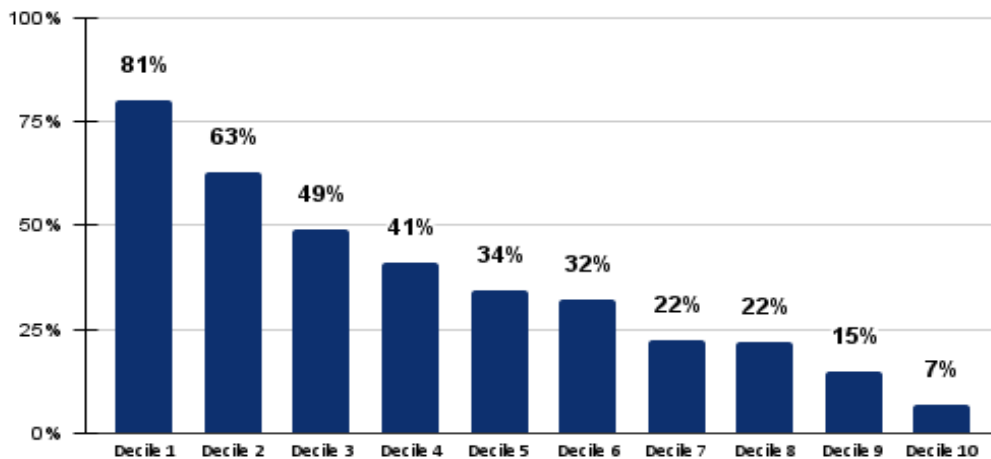


For a more nuanced understanding of the distribution trend, *Table 11* from the Annex presents the same indicators and their distribution across income deciles.

3.1 The Urban / Rural Divide

In Romania, energy poverty affects various segments of society, manifesting differently in rural and urban settings. Households in the lowest income deciles are predominantly located in rural areas and rely mainly on wood for heating, a fuel that is bought also from the irregular markets. As *Table 6* indicates, **81% of the households located in the first income group are burning wood or other solid fuel.** The percentage decreases to 63% and 49% to the second and the third income groups. If it is to compare with the wealthiest households from Romania situated in *Table 6. Distribution per income deciles of the households which use wood or other solid fuels for heating in 2022.*

Distribution per income deciles of the households which use wood or other solid fuels for heating - 2022



the ninth- or tenth-income deciles, only 15% and 7%, respectively, burn wood for heating. More importantly, looking at the distribution of energy poverty indicators across areas of residence, **74.3%²⁷ of the households that fall under the M/2 incidence are located in the rural areas.** For all the other indicators (2M, LIHC and 10%) there is rather a fair distribution across geographical areas. As such, for the LIHC indicator, 53.3% of the households are located in the rural areas and 46.7% in the urban areas. For the 10% indicators, more households are located in the urban areas - 52.5% and for the 2M, the distribution is almost even - 49.3% in rural areas and 50.7% in the urban areas.

²⁷ The percentages were calculated based on 2020 HBS data.

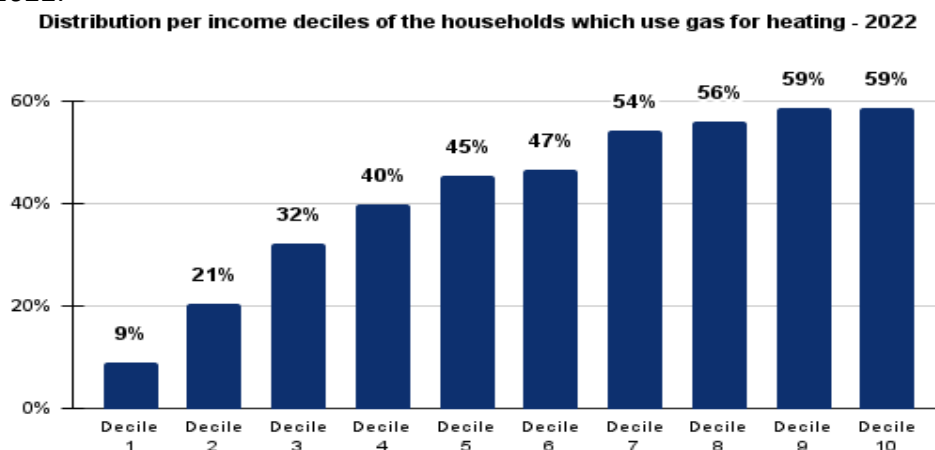


Rural areas are particular not only through the fuel households use for heating and the distribution of energy poverty indicators, but also through other contributing factors. While **gas stoves are present in 3.1% of households, around 68% of them are located in the rural areas.** Being an inefficient means of heating, the households using these devices are most likely captive, pay high energy bills and cannot afford to switch to other more efficient devices. These specific households will be directly impacted by the ETS 2 mechanism and need targeted interventions. Moreover, being a small percentage, these households can be relatively easily identified and included in the national SCP.

Another important consideration for the rural areas is that the houses are fairly old and built out of natural materials that are not energy efficient. In addition to the old devices used for heating (wood and only marginally gas), **these households face triple vulnerabilities: low incomes, energy inefficient constructions and old heating devices.** Moreover, as 2022 indicated, every spike in energy prices leads to increased costs for other fuels, including wood. Being available on the irregular market, its price is volatile and soars in times of crisis. Therefore, **energy poor households that use wood for heating and are situated in rural areas need special attention in the SCP as they are indirectly impacted by the ETS 2 implementation.**

The urban geographies in Romania are complex, different among themselves and fairly unequal. In terms of heating infrastructure, large cities still have a district heating infrastructure, among other sources of energy available for their inhabitants. District heating is not very popular and across Romania only 11% of the households are still connected to the type of heating system. The root causes are complex and are related both to the communist era and the transition to democracy years. The rest of the inhabitants mostly use individual boiler gas for heating, and rather marginally they rely on wood, or electricity for heating. In small and medium sized cities, inhabitants rely largely on individual boiler gas, gas stoves and marginally wood. As a general percentage, 42.2% of the households use

Table 7. Distribution per income deciles of the households which use gas for heating in 2022.





individual boiler gas for heating and a large majority are localized in urban areas (78.5%).

As *Table 7* indicates, starting with the third and the fourth income deciles, a larger proportion of the households use gas for heating. Moreover, these deciles correspond largely with the urban areas (small, medium and large). Therefore, these households will be directly impacted by the implementation of ETS 2.

In a more granular perspective, the third, fourth, fifth and even sixth income deciles will be the most impacted by the introduction of ETS 2. These deciles are also very vulnerable according to LIHC and 10% indicators, use largely gas for heating and are localized in the urban areas. Therefore, **the Social Climate Plan should focus on these urban households that utilize gas and fall within the lower to middle income range.** Incorporating considerations for buildings with low energy efficiency further refines the identification of households in need. Nonetheless, by concentrating solely on these groups, the plan overlooks rural households dependent on wood for heating, which will also feel the secondary effects of ETS 2, since spikes in gas and electricity prices typically lead to increased costs for other fuels.

3.2 The impact of ETS 2 on households

Each energy fuel price increase translates immediately into higher energy bills and a generalized higher cost to other goods and services, including transport. Based on 2022 data from the Household Budget Survey (HBS), 37% of Romanian households spent over 10% of their income on energy bills (electricity and heating), noting significant disparities among different income levels. The introduction of ETS 2 is expected to further inflate energy bills and the households cost with the mobility (transport). **Projections based on the 2022 HBS suggest that the new carbon pricing will increase a household's total expenditures by around 5% (refer to Table 8).**

As highlighted in *Table 8*, the carbon tax will primarily reflect on heating expenses, especially for lower-middle income groups in Romania. Starting with the fourth income decile, the households will have an additional cost of around 3% to the total expenses due to the higher prices for heating (gas in this model). The lowest income deciles, mainly using wood for heating, will be less directly affected since wood is not covered by ETS 2. Yet, they'll face indirect consequences as a surge in gas prices can drive up demand and prices for alternative fuels like wood. This scenario was evident in the 2021/2022 winter, when wood prices soared and government efforts

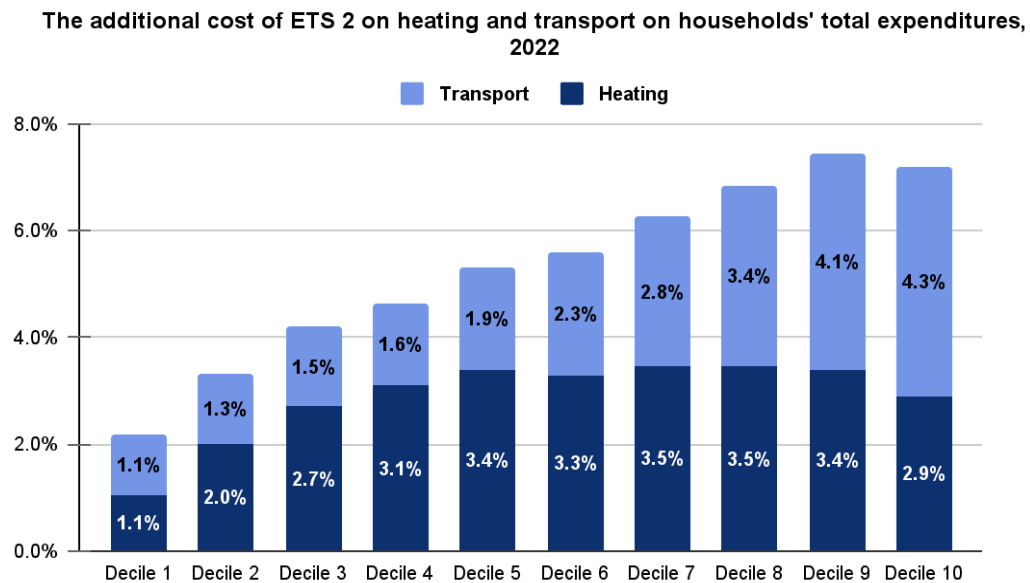


to control the situation proved ineffective, leading to a surge in prices in the irregular market.

Middle-income families will face the regressive effect of ETS 2 since these families have limited financial flexibility, with every price adjustment directly affecting their disposable income. These households also lack the means for significant investments in switching to low carbon heating solutions or undertaking extensive building renovations, necessitating government assistance or other types of institutional support for such long-term initiatives.

In terms of transportation, the highest burden, about 4% of total expenses, will be borne by the wealthiest households. This aligns with the observation that higher-income families are more likely to use personal vehicles for daily commuting compared to those in lower and middle-income groups. Nonetheless, **attention should be paid to the mobility of the lowest income groups. The seemingly minor impact on them may obscure underlying issues of restricted mobility and the need**

Table 8. The additional cost of ETS 2 on heating and transport on households' total expenditures, 2022



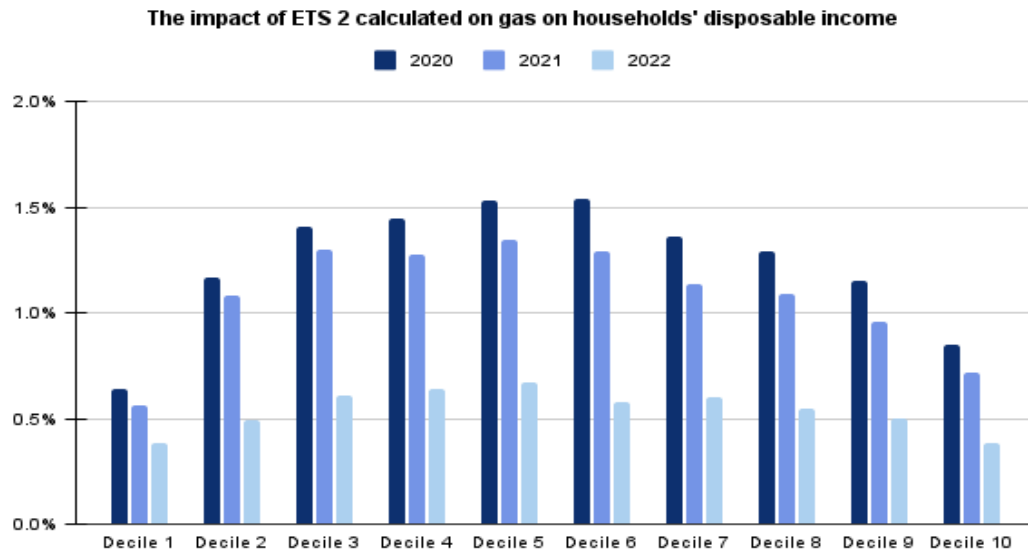
for improved infrastructure and public transportation services.

In a more granular perspective, looking at the impact of ETS 2 on the households' disposable income (no behavioral intervention was taken into account when calculating the impact), there are important differences across years - 2020, 2021 and 2022. Firstly, as a general observation, the biggest impact on the households' disposable income will be felt by the medium income households (from the third to



the sixth income decile). Secondly, the impact decreases across years. For 2020, a year of lock down and increased domestic consumption, the average impact is 1.24% of the total disposable income with a spike of around 1.5% for the medium

Table 9. The impact of ETS 2 calculated on gas on households' disposable income. A distribution across income deciles and across 2020, 2021 and 2022.



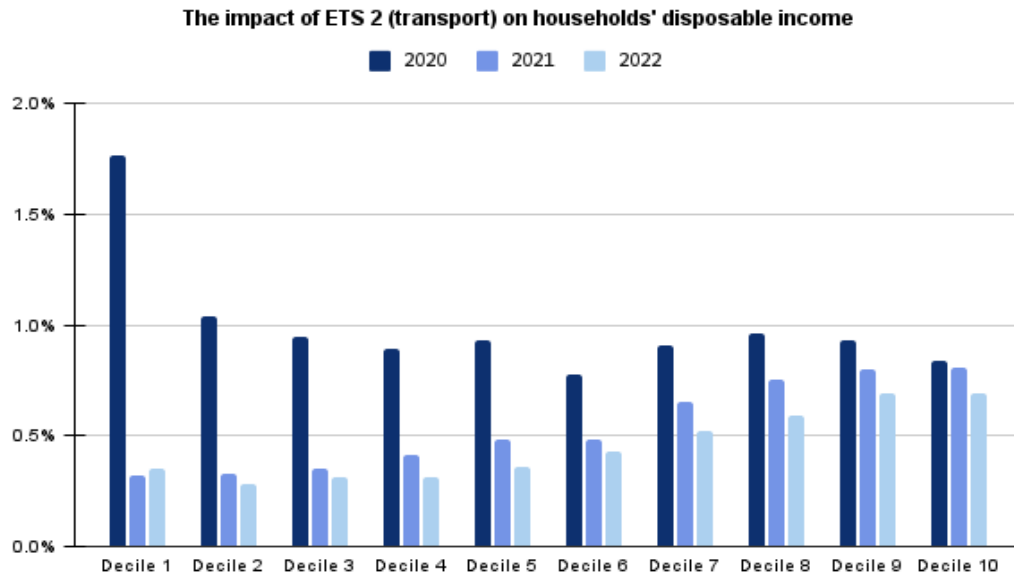
income deciles - see Table 9. For 2021 and 2022, the impact is decreasing, with the most visible reduction for 2022. For example, in 2022, the average impact was situated at 0.54% of the households' disposable income and the highest impact was situated at 0.67% for the fifth income decile. Basically, in times of energy crisis with a high record in the prices, the households partially modified their patterns of consumption. This finding is consistent with the fact that households are sensitive to price signaling and may reduce their consumption. Another important factor is given by the income increase from 2020 to 2022. However, the income increase was not moderated by the high inflation rate.

Similar findings have been observed when assessing the impact of ETS 2 on transport across 2020, 2021 and 2022 - see Table 10. While the impact on households' disposable income is decreasing from 2020 to 2022 indicating again that households are sensitive to price signals, there are also particular observations. Firstly, in 2020, within the lockdown and the reduced mobility, the most impacted groups were the first to middle income deciles who had to find ways for mobility or pay higher costs in the context of the curfew. The average impact for 2020 was situated at around 1% on the households' disposable income. As Table 10 indicates, for 2021 and 2022, the impact on the households' income has reduced significantly to an average of 0.54% in 2021 and 0.45% in 2022. While in 2020, the highest impact was on the low to middle income deciles indicating the effect of the lock



down on the mobility of the ones forced to work or do activities outside their household, for 2021 and 2022, the biggest impact is on the medium to higher income groups who tend to use more their personal cars for daily activities.

Table 10. The impact of ETS 2 calculated on transport on households' disposable income. A distribution across income deciles and across 2020, 2021 and 2022.



While discussions about energy poverty are present in the public debate, transport poverty remains a topic addressed rather by local authorities and individuals in their process to find ways of mobility. This fact adds an extra layer of complexity, as policy makers will have to identify and tailor solutions for the households that are in transport poverty.

Despite the stringent aspect of identifying and targeting the vulnerable, the SCP need to develop a set of policies that should have a double vocation: immediate relief, as short-term measure, and structural programmes (thermal rehabilitation of the building stock, tailored local intervention, green public transport, etc.) that would address the root causes of vulnerabilities. Both developing and implementing the policies require interagency cooperation among various ministries, administrative capacity for the design and implementation, institutional coordination for ownership and constant evaluation and constant involvement of the local authorities in the process. Previous consultations with the decision makers indicated that structural problems need a rather inter-ministerial approach, where expertise from various sectors is put together in both profiling the vulnerable and developing measures. Moreover, in a top-down governance model,



local authorities may lack the capacity to implement strategies or may confront different realities. Therefore, all layers of governance, from central to local authorities, need to have their roles clearly defined.

Among these actors and processes, civil society organisations and the private sector may also play an important part in both the consultation process and the implementation of the policies. Consultations for the Just Transition Fund indicate that in case of structural challenges diverse societal actors may play an important role in designing better policies. Moreover, learning from previous programmes designed to thermally rehabilitate the multi-family building blocks, the SCP should include the energy poor households as a top priority in any type of long-term policy.

BOX 1. The case of Transport Poverty in Romania

While energy poverty is a rather established concept in the Romanian public debates, there are no discussions on transport poverty or other associated indicators. In Romania, transport mobility can be grouped in two large categories: public or private. Usually, large urban to medium sized areas are islands of transport mobility with a fairly good public infrastructure and a system of subsidies for the vulnerable groups (retired people, students and other categories). While large urban areas have extended and new neighbourhoods have been constructed, public transportation lines generally reach these new areas. The price of the tickets and other costs associated are established locally by each municipality. In addition to this system, Romania displays a railway infrastructure that was historically used for commuting and traveling across the country. The railway infrastructure is rather in decay and not so much used (long travel times, rather poor conditions).

When discussing private mobility, there is a need to focus on car ownership. Romania has one of the oldest car fleets across Europe due to a high import of polluting second hand cars. Across income deciles, the highest percentage of households owning a car (more than 30%) is situated in the seventh, eighth, ninth- and tenth-income deciles. According to HBS data, around half of the Romanian households do not own a car.

Due to a limited reliance on HBS data for computing transport poverty indicators, it is important to use other data sets and assess the situation of transport mobility across Romania. High fuel prices are impacting both households with limited mobility (in a form of hidden transport poverty - their mobility is very limited on HBS data) and the ones with higher mobility (the ones that use personal cars for



their mobility). As per 2022 HBS data and mirroring the energy poverty indicators, 42.3% of the households spent double the national median on transport, 45% spent half the national median on transport, 10.6% fall under the poverty line after paying for transport services and 13.1% of households spent more than 10% on transport services. However, a high proportion of households declare they have no cost with the transport (around 40%) and the value of the median for 2022 was 33 lei, around 7 Euro. Therefore, all these data should be treated with caution as they may not reflect the real situation of transport mobility and vulnerabilities.

In assessing vulnerabilities and developing recommendations, aspects related to access and affordability to public transport or other alternative modes of transport, as well as other geographical factors, including access to goods and services or proximity to the workplace need to be considered.

4. Policy recommendations for a socially compatible carbon pricing mechanism

Based on the evidence presented above a number of policy solutions may be considered.

4.1 Targeted policies for the most affected households

The underlying assumption of this set of recommendations is that better targeting results in better designed policies, lower implementation costs and better impact.

1. Households heating on gas, with a special focus on those that use individual gas boilers, are especially targeted by the negative externalities of ETS 2 measures and should be prioritized in policymaking. Another affected category is households using gas stoves. These make up 3.1% of the national household population and are predominantly located in rural areas (68%).
2. Households using wood stoves are also particularly vulnerable. Even if these households are not directly impacted by ETS 2, they are exposed to the associated energy price fluctuations, especially given the strongly deregulated character of the wood market. Failing to address this category in the Social Climate Plan would result in higher inequality and increased energy poverty manifestations. 75% of households in hidden energy poverty are residing in the rural areas and mainly use wood for heating.



3. Households in various forms of transport vulnerabilities, either with limited access to means of public transportation, or with no availability or reduced affordability. A more in-depth analysis is needed for better identifying the households in transport poverty located in rural or small urban areas. Moreover, there is a need for extra datasets for identifying the most exposed group to transport poverty and ETS 2.

4.2 Dedicated thermal insulation programmes

1. **Insulation programmes to target energy poor households:** Various programmes have been made available to households over time, offering a diversity of financing schemes, from programmes requiring co-financing, highly unpopular with the beneficiaries, to full rehabilitation grants. None of these programmes have prioritized energy poverty. The current Renovation Wave, programme which is active under the National Recovery and Resilience Plan, addresses it only marginally. As a matter of principle, vulnerable households rarely make it to the beneficiary lists due to various bureaucracy-related limitations, financial constraints, or the lack of information. Proper targeting is important and local public administrations are best suited to perform this task, as they are the administrative layer that is closest to the beneficiary. In addition to income data, which is habitually collected at this level, local administrations should collect building-specific information to help identify the most effective solutions needed, while aiming to reduce the dependence of households on financial aid programmes. The participation of energy auditors is essential in the process, and it should be facilitated by the local administrations through appropriate programmes.
2. **Increased local cooperation between construction authorities and experts:** An administrative consolidation of the local offices responsible with construction and rehabilitation and a stronger cooperation between them (dedicated offices of the local administration or the State Construction Inspectorate) would not only improve the implementation of energy efficiency standards over-all, but it would also improve the identification of the most vulnerable buildings residing in local communities.
3. **Dedicated energy efficiency programmes to rural households:** Energy efficiency programmes have so far targeted urban households exclusively, and mainly multi-family buildings. Rural households experience overlaying vulnerabilities and are also particularly exposed to ETS 2 externalities. The absence of thermal rehabilitation policies in this area should be reconsidered, and an appropriate



safety net should target these rural-specific vulnerabilities. The rural sector needs multiple types of actions in addition to thermal rehabilitation: the replacement of heating stoves with more efficient ones, the more dynamic implementation of renewable technologies, or the stricter regulation of firewood given that wood will remain an important fuel for the rural environment.

4. **The diversification of resources and market models with more flexible and adapted logics:** Access to clean, diversified, and accessible sources of energy is another principle of energy welfare. One of the characteristics of energy poverty in Romania is the existence of islands of energy captivity, where alternative sources of energy are scarce or completely absent, volatile pricewise and polluting, such as wood in the rural area and district heating in urban departments. Alternative and clean sources may only be available at very high costs, and therefore inaccessible to the vulnerable. The development of additional energy sources and market models suitable for the local consumption profiles, such as for instance rural cooperatives for the exploitation, drying and use of firewood, should be financed in order to address the problems related to heating in energy scarce regions. Feasibility studies and community dialogues aimed at identifying the most appropriate solutions should be carried out.
5. **Local financial and technical programmes:** Given the high and inaccessible upfront costs of some of these interventions, local financing schemes, including public guarantees, and programmes should be developed in addition to national programmes, to help reduce the effort for vulnerable households to access these solutions. They should be designed in a differentiated way to address the needs of middle-income and low-income families. Local partnerships and initiatives have the benefit of fostering local solutions and innovation while easing the financial and technical efforts assumed by public administrations in the process.

4.3 Governance measures

Governance measures are necessary in order to increase the quality of decision-making, participation and representation, the democratic consensus, trust, cooperation and local innovation. On this basis, we make the following recommendations:

1. Increased institutional cooperation at the national and local level for the benefit of designing integrated and inclusive redistribution policies, clear targeting and distribution criteria. We favor the concept of a tripartite committee or a consultative interministerial body that would assume the responsibility of planning and monitoring based on the experiences of previously implemented programmes (ETS 1, which had a low regressive



character) and that of the stakeholders involved (ideally ministries and other public authorities, market actors and the civil society);

2. The development of One-Stop Shops at the level of Local Authorities. These facilities could fulfill several functions: data collection, tailored measures, technical, legal and financial advice, the development of local partnerships.
3. These two levels of decision-making should be effectively integrated.

4.4 Technical solutions

Long-term subsidization of targeted households through various financial schemes does not appear as a feasible economic, social, or environmental solution. We favor community-based models that resemble economies of scale and foster a safety net for vulnerable households:

1. Centralized heating systems: Where feasible, these models should be reconsidered in local communities for increased efficiency and reduced costs. Given the scale of formerly communist systems in Romania, decarbonizing existing systems should be examined.
2. Public transportation systems: It is highly unlikely that vulnerable households could afford electric or low-polluting cars, but solutions come from expanding and improving the quality of the public transportation network.

4.5 Direct and indirect payments to the affected households

There is need for differentiated yet equitable and economically performant taxation and income redistributions systems:

1. Short-term redistributions instruments, whether in the form of allowances, vouchers, or price compensation, should enable vulnerable households to face the high upfront energy efficiency investment costs that would have positive medium and long-term returns in terms of household welfare.
2. Medium-term redistribution programmes should include the development of green transportation programmes aimed at vulnerable households.

4.6 Public communication and awareness raising

Given the generalized low trust of the population, sustained and targeted communication is needed around the broader energy transition project and the specific individual instruments employed.

1. Communication on the fundamental principles underlying the process of energy transition in the EU: despite the high acknowledgement of the climate



emergency topic in the population, evidence shows that there are low individual behavioral incentives to engage in the process effectively and to assume the related efforts. Moreover, in the context of European elections waves of skepticism become visible not only at the level of the population, but also in the mainstream media discouraging the uptake of new technologies and programmes, and the general trust in authorities and their capacity to design and implement them. The costs, benefits and actions needed are not completely understood by the population and should be communicated more systematically and through clearer messages that are able to generate increased public acceptance, higher participation and a broader democratic consensus.

2. Communication should engage politicians more directly to prevent political delays and blockades on these topics and to generate a more long-term sustainable political vision.
3. More sustained engagement of local authorities in ETS 2 related dialogues is needed. Local authorities are a key administrative level in the process of ETS 2 implementation. Yet, as previous transition programmes have proved it, the capacity of these authorities to understand and operate with such programmes is limited. Their exposure to good practices and other national and EU-wide policy dialogues should be prioritized.
4. Community-level dialogue should be increased. This should be based on a targeted engagement of key local stakeholders, such as homeowners' associations. Such communication campaigns should focus on understanding community challenges, but also on increasing cooperation for the benefit of community projects, facilitating the access to thermal rehabilitation programmes, the uptake of renewable technologies or the acceptance of models such as the district heating or public transportation initiatives which currently score very low in public support, given their failure to provide high quality services in the population over time.

4.7 Data-based decision making

Better decision-making is based on the availability of better data and a systematic approach to monitoring and evaluation. There is high need for a diversity of data to support the design of appropriate policies that are able to target with precision and generate visible outcomes:

1. Currently the National Institute of Statistics (INS) is the most reliable and systematic provider of data at the national level. However, many gaps have been identified with respect to the quality, diversity, and granularity of evidence.



These need to be addressed in order to improve the basis for decision-making. Examples of additional evidence needed relates to building energy efficiency or vulnerable populations. An open dialogue aimed at increasing the availability of data is needed.

2. The role of public authorities in data collection needs to be consolidated. There are high volumes of data which are being collected by local administrations, but which remain unsystematized and unused. Moreover, the knowledge that local administrations have on energy poverty through the social services needs to be exploited more effectively. The highest gap that should be recognized and bridged in this regard is data pertaining to the rural housing sector.
3. Other important stakeholders collect data systematically and need to be engaged more permanently in the process. Duplicating data-collection efforts is costly and inefficient. Therefore, creating a higher engagement climate dominated by a culture of trust and community service should be prioritized by the national and local public authorities. Such entities are for instance the energy suppliers and distributors and specialized NGOs and academic/research entities. Currently, the former operate in a highly untrustful environment given their traditional lack of engagement in the policy process and their profit-only focus, whereas the latter have been marginally co-opted in energy-market conversations as the energy sector was considered highly technical, economic, and sealed to public engagement.
4. Access to data can benefit the individual consumer and consolidate their position on the market. The Introduction of an economic bulletin in the governmental cloud for population records, with the possibility to generate an individualized consumer profile would be an important knowledge tool for the benefit of consumers. Additionally, facilitating the switching of electricity and gas suppliers, though, for instance, the development of a consumer card, may increase market efficiency overall and the control of households over the process. Energy cards can be used to generate comprehensive databases for the benefit of the user and offer a better understanding of individual consumption habits. Another proposed solution is the implementation of individualized smart metering. Romania is one of the member-states with the lowest uptake of smart metering in the EU, which may result in high policy-making difficulties and mistargeting. Moreover, in situations of frequent and overlapping energy crises, as it has been the case more recently with COVID and the war in Ukraine, spiking vulnerability remains only statistically visible, ultimately difficult to address given the failure to spot the affected population more precisely. Real-time consumption data is not only convenient for the individual consumer, who may implement more efficient



individual consumption behaviors, but also to market actors and public authorities. The effective implementation of ETS 2 measures will benefit from understanding overall energy consumption trends.



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Photos sources: [Emil Boc Facebook page](#), [presasm.ro](#), [G4media.ro](#), [Libertatea.ro](#)



6. Annexes

The distribution of energy poverty indicators across income deciles - 2021

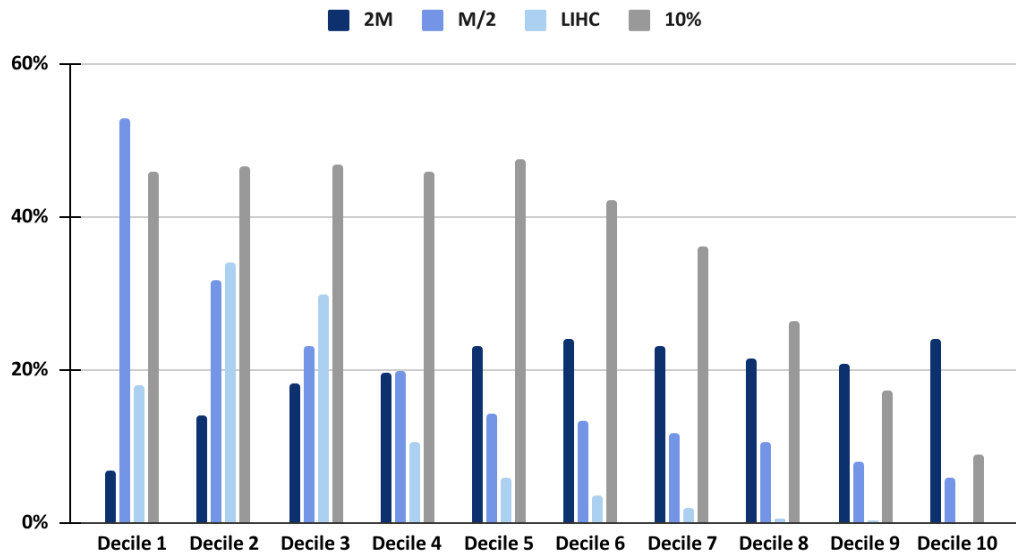


Table 11. The distribution of energy poverty indicators across income deciles, 2021