A SOCIALLY-JUST EU RENOVATION WAVE

RECOMMENDATIONS FOR EU POLICYMAKERS BASED ON FINDINGS IN 10 MEMBER STATES

MAY 2022

IEECP
INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY

ACKNOWLEDGEMENTS

WE ARE GRATEFUL TO THE FOLLOWING INDIVIDUALS FOR CONTRIBUTING THEIR EXPERTISE AND INSIGHT:

Renée Bruel,
European Climate Foundation

Emmanuelle Causse,
International Union of Property Owners

Clotilde Clark-Foulquier,
FEANTSA

Roland Gladushenko,
European Insulation Manufacturers Association

Agnes Kelemen,
European Climate Foundation

Jaume Loffredo,
European Consumer Organisation

Martha Myers,
Friends of the Earth Europe

Thomas Nowak,
European Heat Pump Association

Cristina Pricop,
European Public Health Alliance

Davide Sabbadin,
European Environmental Bureau

Hélène Sibileau,
Buildings Performance Institute Europe

Louise Sunderland,
Regulatory Assistance Project

Samuel Thomas,
Regulatory Assistance Project

The reports have also benefitted from the valuable contribution from national experts and stakeholders in the ten countries studied.

ANALYTICAL TEAM

Vlasios Oikonomou

Ivana Rogulj

Jen Heemann

Giulia Pizzini

Mara Oprea

Axelle Gallerand

at the Institute for European Energy and Climate Policy

PROJECT COORDINATION

Ting Zhang

Femke de Jong

Eleonora Moschini

Darrelle Colleran

at the European Climate Foundation

DESIGNER

Noble Studio

This is a summary report, based on the Institute for European Energy and Climate Policy (IEECP) report series "Study on the impacts of policies to decarbonise residential buildings on energy poverty in Central, Eastern and Southern Europe and mitigation strategies", which can be read on the website of IEECP. For more information about this summary report, please contact Ting Zhang at *ting.zhang@europeanclimate.org*.

DISCLAIMER

The stakeholders who contributed to this study shared the aim of establishing a constructive and transparent exchange of views on the data, assumptions and design of the scenarios used for modelling the impacts of the building decarbonisation policies on low-income households. Each stakeholder contributed their knowledge and vision on these issues. The information and conclusions in this report should not be treated as binding on the organisations involved.

CONTENTS

KEY TAKEAWAYS

The EU's transition to net-zero greenhouse gas emissions by 2050 has to be a socially-just transition that includes all segments of society if it is to receive the public support it needs to succeed. This means that measures to mitigate climate change need to be inclusive and produce benefits for households with the lowest incomes, who otherwise risk being left behind. One key place to start is Europe's homes.

This study, based on a report series by the Institute for European Energy and Climate Policy, shows that **the European Green Deal could deliver a fairer society, ensuring that the poorest and most vulnerable in our communities have access to clean, affordable heating and live in energy efficient homes.**

The EU's building sector is responsible for 36% of the EU's energy-related greenhouse gas emissions and 40% of its energy consumption. To meet its climate goals, the EU will need to cut 60% of the building sector greenhouse emissions by 2030 and fully decarbonise it by 2050. Buildings — such as hospitals, schools, homes, offices — therefore have a central place in EU's efforts to respond to the climate emergency.

At the same time, skyrocketing gas prices are straining households, pushing the most vulnerable ones (deeper) into energy poverty. Insulating homes and switching to clean heating will slash emissions from Europe's buildings and structurally alleviate energy poverty that is a widespread and persistent problem in the ten countries that are the focus of this study, namely Bulgaria, Greece, Hungary, Romania, Czechia, Slovakia, Poland, Italy, Portugal and Spain.

Reducing energy consumption in homes and moving away from fossil fuels for heating would also reduce Europe's dependence on Russian gas imports and help shield citizens from volatile fossil fuel prices. Energy renovation and clean heating, hence, can be crucial in improving Europe's energy security.

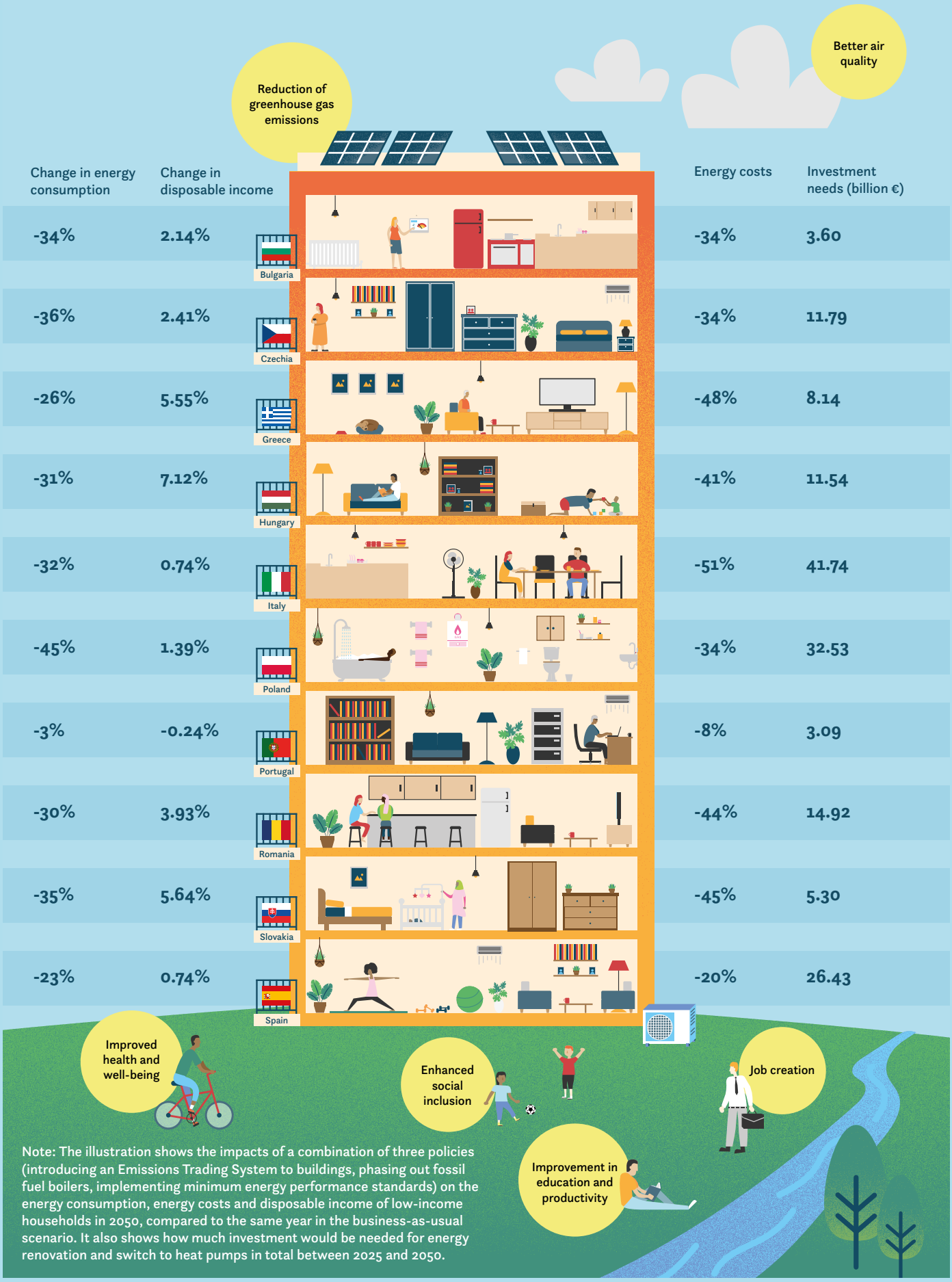
The study finds that a mutually reinforcing combination of building regulations to increase energy renovations and the uptake of clean heating in homes, combined with a smart recycling of carbon pricing revenues, is beneficial for low-income households. **If well-designed, the EU Renovation Wave can cut low-income households' energy costs by a third, reduce energy waste from badly insulated homes and increase the disposable income of low-income households in the medium to long term.**

KEY FINDINGS:

- The introduction of minimum energy performance standards for buildings together with the phase out of the sale of fossil fuel boilers and a carbon price for heating fuels would reduce low-income households' energy costs by a third and increase their disposable income in the medium to long run compared to business as usual, in addition to providing a wider range of environmental, social and economic benefits. Introducing all three policies simultaneously would also result in the lowest energy costs and the highest disposable incomes in 2050 compared to implementing only one or two of the policies.
- Introducing a carbon price on heating fuels without additional building policies to incentivise energy renovation and a switch to clean heating could jeopardise the basic energy needs of low-income households as well as their health. They already consume on average 28% less energy than average-income households, meaning there is little they can do to further reduce energy use unless structural measures are taken to enable them to do so.
- Minimum energy performance standards to upgrade buildings to energy label E by 2033 and then to label D by 2040 could make low-income households energy bills on average 19% lower in 2050 across the ten countries analysed compared to when no additional policies are implemented. Such standards would also improve their thermal comfort and health as lower income households tend to live in inefficient homes. If the standards are introduced in combination with a phase-out of fossil fuel boilers, the energy cost reduction is 30% on average compared to the baseline in 2050. The introduction of these renovation standards generates the most benefits for lower-income households when supported by social safeguards to maintain or ensure access to decent housing for tenants and accompanied by technical as well as financial support to help low-income households (or owners of the buildings where they live) to meet the standards.
- If no additional policies are implemented to decarbonise Europe's buildings, then not only will the EU fail to reach its climate targets, but low-income households in the ten countries would also be spending on average 19% more on energy than they do now while being left out of the energy transition.
- With high gas prices, households can save even more on their energy bills when using renewable heating and living in better insulated homes. The modelling for this study was based on energy price assumptions made in 2020, so the savings in energy costs are likely to have been underestimated. Since then, there have been big increases in energy prices, with retail gas prices for households in EU capital cities up by 65% in February 2022 year-on-year.
- Substantial public funding needs to be set aside for investments (with a high subsidy rate) to decarbonise buildings owned or occupied by low-income households to help them reap the benefits mentioned above. While the proposed Social Climate Fund and national revenues from an emissions trading system for buildings could provide substantial funding, these revenues would not be sufficient to meet the investment needs (about 140 billion euros for the ten countries analysed in the study) of low-income households up to 2040. Additional financing is needed from the next EU budget, revenues from the current emissions trading system, and/or a post-2032 Social Climate Fund to support low-income households in the transition.
- Low-income households face financial and non-financial barriers to home renovations and clean heating installation. Targeted support for low-income households to increase access to funding as well as to implement energy renovation projects and clean heating installation in their homes would help those that are most in need to take up subsidies.

POTENTIAL IMPACTS OF THE EU RENOVATION WAVE ON LOW-INCOME HOUSEHOLDS

	Change in energy consumption	Change in disposable income	Energy costs	Investment needs (billion €)
Bulgaria	-34%	2.14%	-34%	3.60
Czechia	-36%	2.41%	-34%	11.79
Greece	-26%	5.55%	-48%	8.14
Hungary	-31%	7.12%	-41%	11.54
Italy	-32%	0.74%	-51%	41.74
Poland	-45%	1.39%	-34%	32.53
Portugal	-3%	-0.24%	-8%	3.09
Romania	-30%	3.93%	-44%	14.92
Slovakia	-35%	5.64%	-45%	5.30
Spain	-23%	0.74%	-20%	26.43



Note: The illustration shows the impacts of a combination of three policies (introducing an Emissions Trading System to buildings, phasing out fossil fuel boilers, implementing minimum energy performance standards) on the energy consumption, energy costs and disposable income of low-income households in 2050, compared to the same year in the business-as-usual scenario. It also shows how much investment would be needed for energy renovation and switch to heat pumps in total between 2025 and 2050.

INTRODUCTION

Europe is facing a **climate emergency.** The latest assessment by the Intergovernmental Panel on Climate Change warns that the world only has a narrow opportunity of limiting global warming to 1.5 degrees and that this warming will have catastrophic impacts. This calls for a comprehensive response to combat climate change from all facets of society. Buildings, currently making up 36% of EU's energy-related greenhouse gas (GHG) emissions, are an important sector to be decarbonised in order to ensure the EU reaches its legally binding target to cut emissions by at least 55% below 1990 levels by 2030 and its climate neutrality goal by 2050.

Europe is also facing a **social crisis.** Energy poverty is persistent and potentially on the rise in Europe.[1] In 2020, one in 12 European citizens were not able to afford to keep their homes adequately warm. One in 16 were in arrears on their utility bills. Many European citizens find themselves struggling to pay their bills due to soaring gas prices, hitting lowest-income households the hardest. These social disparities are also reflected in health inequalities, with housing conditions being an important environmental determinant of health.

Furthermore, Europe has plunged into an **energy security crisis.** In response to Russia's invasion of Ukraine, European leaders have committed to cut their reliance on Russian fossil fuels, which Europe largely depends on — including for heating homes. However, replacing the Russian supply with fossil fuels — instead of renewables and energy efficiency measures — could derail climate action and deepen Europe's dependence on volatile gas prices.

The three interconnected crises underline the urgency for the EU and national governments to take comprehensive and immediate action. One key place to start is Europe's homes. Insulating homes and switching to clean heating in the coming decade can help lift people out of energy poverty, reduce energy bills and improve inefficient housing, while tackling the climate crisis and improving the EU's energy security.

The Renovation Wave is the EU's intended tool to trigger the massive renovation of buildings and eradicate energy poverty in the coming decade. Yet, low-income households face the highest barriers to renovation and renewables, and risk being locked-in an expensive and polluting fossil fuel infrastructure. As the EU and its member states negotiate policies to accelerate renovations and the uptake of clean heating, there is an opportunity to deliver on the promise to "leave no-one behind" by ensuring that low-income households benefit from the transition to sustainable and healthy homes.

This summary report provides an overview of the main approach and results of the technical reports by the Institute for European Energy and Climate Policy (IEECP), which quantified the impacts of EU climate policies in the building sector proposed as part of the EU Green Deal on low-income groups in ten European countries between now and 2050. The study provides recommendations on how to design measures such as minimum energy performance standards, the phase-out of the installation of fossil fuel boilers, and a new emissions trading system for the building sector to benefit low-income groups. It is the first time that research specifically maps the impacts of EU building policies on the lowest income quintile groups at national level. The full report series "Study on the impacts of policies to decarbonise residential buildings on energy poverty in Central, Eastern and Southern Europe and mitigation strategies" can be read on the IEECP website.

1 Energy poverty is broadly understood as a situation where a household cannot afford basic energy services to obtain a decent standard of living due to the interaction of the three factors: low-income, high-energy expenditure and low energy efficiency of the dwelling. The European Commission has recommended the use of a combination of different indicators to measure energy poverty, of which the four primary indicators are: arrears on utility bills, low absolute energy expenditure, high share of energy expenditure in income, and inability to keep home adequately warm.

METHODOLOGY

The study looked at the impact of EU building policies on low-income households in ten countries: Bulgaria, Czech Republic, Greece, Hungary, Italy, Poland, Portugal, Romania, Slovakia, and Spain. These countries were chosen as case studies because they tend to rank in the bottom half of the EU Member States on important energy poverty indicators (see Figure 1). They share many common characteristics that determine the level of energy poverty nationally, such as:

- a lack of choice of fuel providers in many of the countries studied
- a relatively poor coverage of social protection systems to address structural housing and social exclusion issues
- a slow improvement in energy poverty indicators (which may be reversed by the impacts of the pandemic and high energy prices in recent months).

Of the ten countries, there is a higher degree of tenancy among low-income households in the Southern European countries. A relatively big proportion of them are living in apartments. In Central and Eastern European countries (except Czechia), low-income households are predominantly homeowners that live in houses.

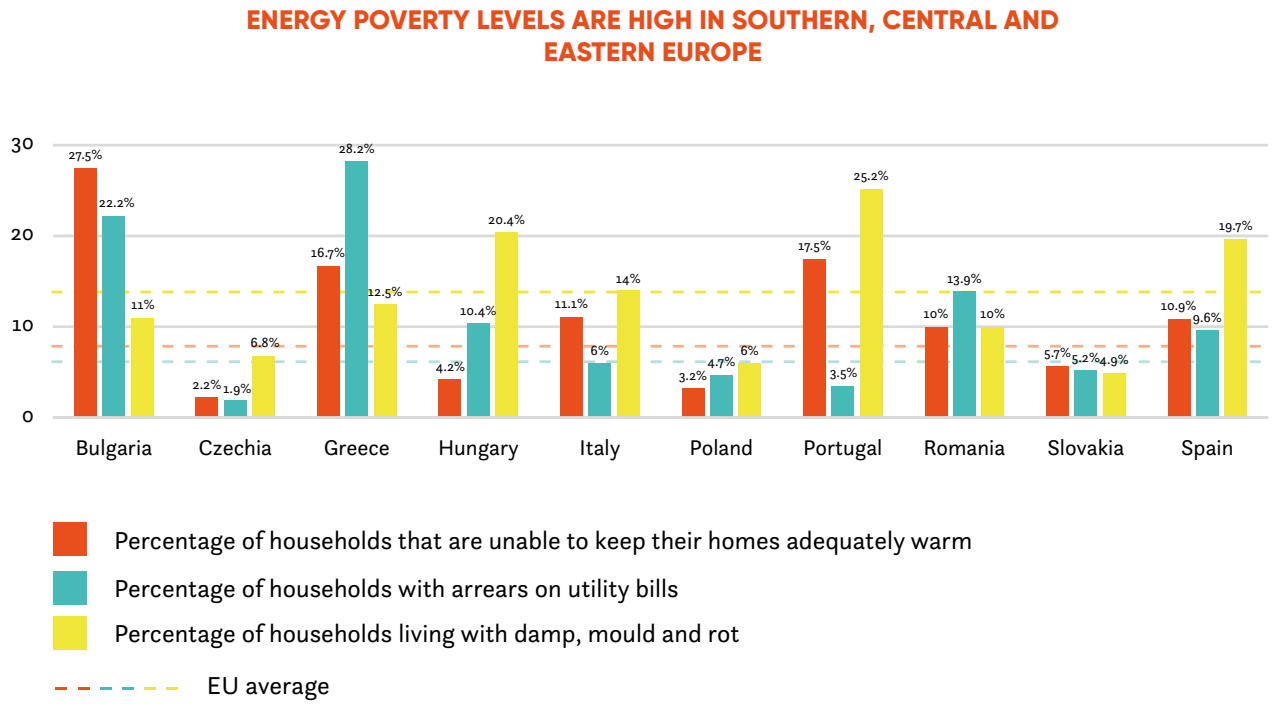


Figure 1: Energy poverty indicators in ten European countries in 2020.
Source: Eurostat

THE APPROACH USED IN THIS PROJECT CAN BE SUMMARISED AS FOLLOWS:

1. Map energy poverty status[2] as well as the directly and indirectly relevant policies to address energy poverty at national level.

2. Calculate the amount of energy that low-income groups (in the first income quintile) consume for space heating and cooling as well as domestic hot water, and which energy carriers are used for supplying that energy.

3. Evaluate the impacts of EU building policies on the total costs[3] for and disposable incomes of low-income groups up to 2050.

4. Estimate the amount of available funding that could be used for covering the investment costs and energy costs for low-income households.

5. Provide a list of policy responses accompanying the introduction of building decarbonisation policies at the EU level and national level (in the case of the latter also reflecting on the results of Step 1).

An EU stakeholder panel, as well as groups of diverse stakeholders in each of the countries, were consulted on a regular basis on the methodology, data collection, the interpretation of the results and the development of policy recommendations.

2 The mapping of energy poverty status covers the areas of energy efficiency, social and economic poverty, well-being and health.

3 The total costs include investment and energy expenditures – based on final energy consumption adjusted to low-income groups.

SCENARIOS AND POLICY CONTEXT

In October 2020, the European Commission launched the Renovation Wave strategy to upgrade Europe's buildings. It put forward several legislative proposals in July and December 2021 on targets, regulations and pricing mechanisms with a view to improve the efficiency of buildings and to promote the use of renewables in buildings.

This study focused on analysing the impact on low-income households of three policies:

- **The introduction of emissions trading in the buildings sector**. Currently, electricity production is subject to a carbon price, while the use of coal, oil and gas for domestic heating is not. The European Commission has proposed to introduce a new emission trading system (ETS) for buildings and transport as of 2026, which means putting a price on emissions from the two sectors. Suppliers of heating fuels will have to pay the carbon price, but they are expected to pass these costs on to building residents, which would make heating with fossil fuels more expensive. To mitigate the potential regressive impacts of this new emissions trading system, the EU has also proposed a new Social Climate Fund, which is planned to be funded from a portion of the revenues from the cap-and-trade scheme and can be used for green investment as well as direct income support. Putting a price on carbon reflects the polluter pays principle and could incentivise energy users to reduce their energy consumption and/or switch to cleaner heating fuels. In addition, revenues generated from carbon pricing could be invested in programmes that help households reduce consumption or make that switch.
- **A phase-out of the installation of fossil fuel boilers.** In its roadmap to net-zero 2050, the International Energy Agency concludes that no new fossil heating boilers should be installed from 2025 on to meet global climate neutrality.[4] Some EU Member States have already adopted or are preparing legislation to phase out fossil fuels from new and/or existing buildings. The European Commission has proposed a legal requirement for Member States to phase out fossil heating by 2040 at the latest and has tasked countries to develop plans and roadmaps to achieve this objective. Moreover, the Energy Performance of Buildings Directive (EPBD) recast proposal bans public funding for fossil fuel boiler installations from 2027, while the Energy Efficiency Directive (EED) recast proposal excludes energy savings from fossil fuel combustion from the national annual energy savings obligation. In addition, the Commission has proposed to downgrade gas boilers to the lowest two energy labels in the ongoing energy labelling revision measure, and several countries have advocated for an EU-wide phase-out of the sale of inefficient fossil heating systems.
- **Introduction of mandatory minimum energy performance standards (MEPS) for existing buildings.** MEPS require existing buildings to meet a certain energy efficiency level by a given date or at a chosen trigger point in the building's lifecycle. In December 2021, the European Commission published its proposal for the EPBD recast, which recognises MEPS as an essential regulatory tool to trigger the renovation of existing buildings on a large scale, as they tackle the key barriers to renovation such as split incentives and co-ownership structures, which cannot be overcome by economic incentives.[5] With its proposal, the European Commission aims to upgrade the worst energy performing buildings and implement a continuous improvement of the national building stock, contributing to the long-term goal of a zero-emissions building stock by 2050.

4 The International Energy Agency, 2021, Net Zero by 2050: A Roadmap for the Global Energy Sector, *https://www.iea.org/events/net-zero-by-2050-a-roadmap-for-the-global-energy-system*

5 EPBD proposal by the European Commission

The IEECP modelled five scenarios that combine different policies and analysed the economic impact in terms of energy costs, disposable income and investment needs of each scenario (see Figure 2).

Figure 2: Scenarios modelled.

6 The evolution of the carbon price is based on a study Vivid Economics conducted for Transport & Environment and the European Climate Foundation. The study is unpublished. The modelling results are available upon request.

7 The cost of installation of heat pumps is assumed to be €8,000.

8 The renovation cost is assumed to be €10,000/dwelling, delivering final energy savings of 30%. In the case of Bulgaria, the assumption is to reach energy label C by 2035, with renovation costs at €25,000/dwelling, delivering final energy savings of 50%. In Hungary, the renovation cost is assumed to be €13,500 for renovation that reaches energy label E and a further €6,500 for reaching label D. This is based on expert and stakeholder input in the country.

9 The renovation cost is assumed to be an additional €5,000/dwelling, delivering additional final energy savings of 10%

10 In Scenario 5, the carbon price is lower compared to the price level in Scenario 1. This is because of the building policies that will be implemented in Scenario 5 that will lead to GHG emissions reductions.

FINDING HIGHLIGHTS

Across all the ten countries analysed, the first income quintile groups, which is the 20% of the population with the lowest income, consume on average 28% less energy than households with the average income of that country. This ranges from 8% less in Romania to 48% less in Portugal (see Figure 3).

Low energy consumption in poor households is not the result of energy efficient housing. Lower-income households are less likely to adopt energy efficiency measures, from high-cost solutions such as home retrofits to medium- and low-cost ones such as energy efficient appliances and lightbulbs.[11] They consume less energy because they tend to occupy smaller houses than average-income households[12] or because they ration their energy use in order to be able to pay the bill. Due to inefficient housing and appliances, low-income households consume more energy to fulfil the same level of basic needs compared to higher-income households.

LOW-INCOME HOUSEHOLDS CONSUME LESS ENERGY THAN AVERAGE-INCOME ONES

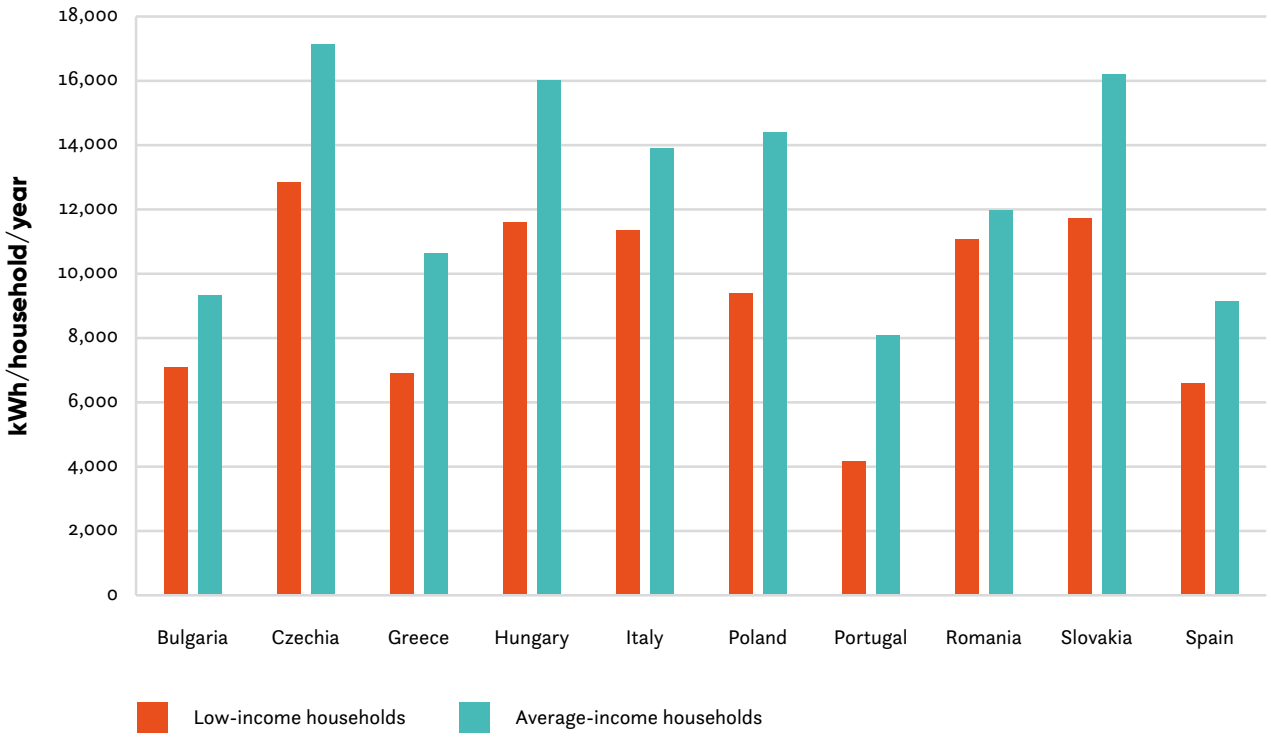


Figure 3: Energy consumption (kWh/household/year) in low-income and average-income households in 2020

CONSIDERATION FOR POLICY:

- In comparison to an average household, a low-income household consumes less energy. There may be little room for further reducing energy consumption without worsening their quality of life and health outcomes unless structural measures are taken to improve the energy performance of buildings such as through insulation or a switch to clean heating systems.

11 Schleich, J. 2019, Energy efficient technology adoption in low-income households in the European Union – What is the evidence?, *Energy Policy* Vol. 125, pp196-206. *https://www.isi.fraunhofer.de/content/dam/isi/dokumente/ccx/2018/Schleich_Energy_efficient_technology_adoption.pdf*

12 Flues, F. and A. Thomas 2015, The distributional effects of energy taxes, OECD *Taxation Working Papers*, No. 23, OECD Publishing, Paris, *https://doi.org/10.1787/5js1qwkqqrbv-en.*

BUSINESS AS USUAL IS COSTLY FOR LOW-INCOME HOUSEHOLDS

The costs of space heating and cooling as well as domestic hot water (here on referred to as the "energy costs") will increase by an average of 19% for low-income groups in the 10 countries in 2050 compared to 2019, if no action is taken to reduce emissions from Europe's homes. This ranges from an increase of 1.83% in Spain to about 30% in Romania, Italy and Portugal (see Figure 4).[13] The cost increase is mainly due to an increase in fossil fuel prices according to the forecasts in the EU Reference Scenario 2020 regarding heating oil, natural gas, coal and liquefied petroleum gas. In addition, electricity prices are also expected to increase in the coming decades according to the EU Reference Scenario 2020. The forecast increases in fossil fuel prices are likely to be an underestimation of actual cost increases since they were made well before the recent spike in gas prices. In fact, retail gas prices for household customers in EU capital cities were up by an estimated 65% in February 2022 year-on-year. With the exception of two countries, gas prices for households in European capital cities were higher in February 2022 compared to February 2021. In six capital cities prices more than doubled, and in one prices even tripled.[14]

ENERGY BILLS OF LOW-INCOME HOUSEHOLDS WOULD INCREASE WITHOUT CLIMATE ACTION

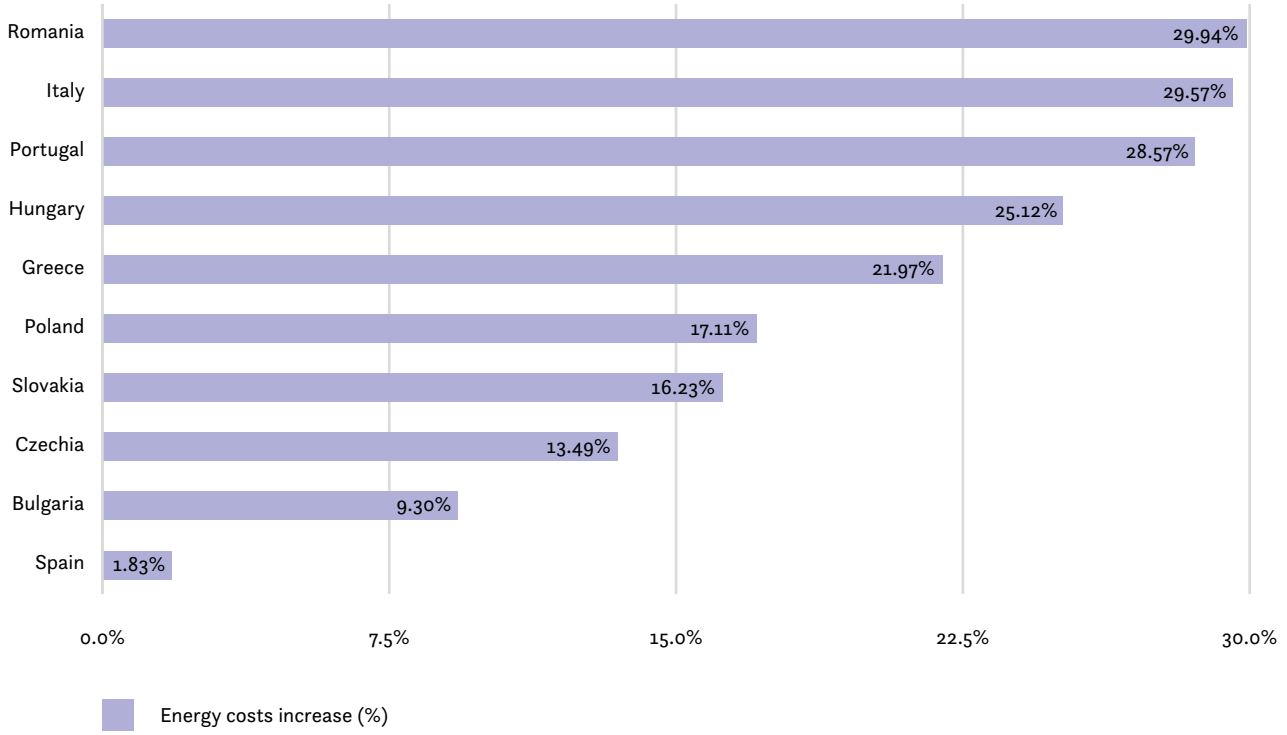


Figure 4: Energy costs increase (%) for low-income households in 10 countries in the business-as-usual scenario in 2050 compared to 2019.

CONSIDERATION FOR POLICY:

- If no action is taken to reduce greenhouse gas emissions from Europe's buildings, energy bills of low-income households go up in the coming decades.

13 For electricity, the costs were calculated considering the changes in price due to the evolution of the carbon price in the EU Emissions Trading System, which is based on the carbon intensity of the electricity production sector in 2030, 2040 and 2050, according to the projection for each Member State in the EU Reference Scenario 2020. For the other fuels, the costs were calculated taking into consideration the different energy prices for each energy carrier as well as the different VAT per country.

14 Energy, D. G. 2021, Quarterly report on European Gas Markets. Market Oberservatory for Energy. *https://energy.ec.europa.eu/system/files/2022-04/Quarterly%20report%20on%20European%20gas%20markets_Q4%202021.pdf*

THE INTRODUCTION OF EMISSIONS TRADING FOR THE BUILDINGS SECTOR HAS ITS LIMITATIONS AS A STANDALONE INSTRUMENT

Introducing emissions trading for the buildings sector makes the use of fossil fuels for heating homes more expensive. However, the expected increase in energy costs compared to business as usual is limited: a difference of 5% on average across the 10 countries in 2050. This is because it was assumed that low-income households would reduce their energy consumption in response to the fuel price increase (see Figure 5).[15] This decrease in consumption could be at the expense of thermal comfort and health in a group that may already be underheating their homes, since these households already use less energy than the average household (see Figure 3). Energy rationing and the inability to keep a home warm can lead to unhealthy indoor environments, cold or underheated homes, damp and mould, which are known contributors to cardiovascular and respiratory diseases as well as mental health problems, and, in some cases, cold- or heat- related morbidity.[16] In addition, energy poverty is linked to negative impacts on social inclusion, educational attainment and productivity, further engendering health inequalities between income groups.

THE POOREST WOULD PAY HIGHER BILLS WITH AN EMISSION TRADING SYSTEM FOR BUILDINGS AS A STANDALONE POLICY AND IF ITS REVENUES ARE NOT INVESTED IN DECARBONISING HOMES

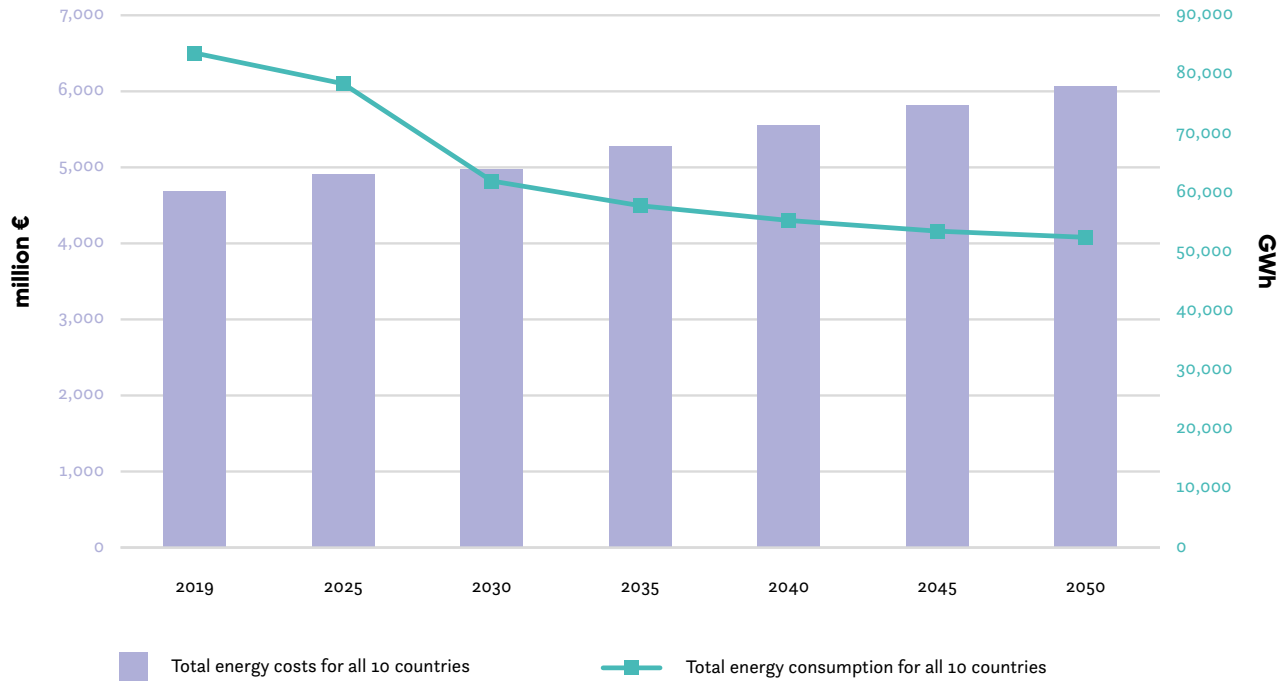


Figure 5: Total energy consumption (GWh) and energy costs (€ million) of low-income households for the 10 countries with the introduction of an emissions trading system for buildings (2019-2050).

15 The study makes the assumption that a carbon price will trigger a reduction in energy demand. The amount of reduction is calculated based on price elasticity data for each country. It should be noted that the elasticities used are for average households, as there is a lack of data on price elasticities of low-income households. The use of average data has its limitation as low-income households are less able to react to price increases with energy renovation or by switching fuel. Although a part of their reduction in energy consumption could come from behavioral changes, most of it would come from reducing comfort and compromising on health, such as by underheating their homes.

16 Tod, A. and Thomson, H. 2016, Health impacts of cold housing and energy poverty, in "Energy Poverty Handbook", edited by the Greens/EFA group of the European Parliament. *https://www.bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf*

A price signal will not be adequate on its own to stimulate energy efficiency upgrades or a switch to clean heating systems in the medium to long run because of the high upfront costs associated with these investments, the exclusion of low-income households from accessing financial services, and split incentives[17] in the rental market. However, a benefit of carbon pricing is that it generates revenues that can be used to help low-income households finance high upfront investments to renovate their homes or install a heat pump. This would then help mitigate the impacts of carbon pricing on their energy bills and enable them to achieve higher thermal comfort. The revenues could also cover the potential increase in energy costs.

CONSIDERATIONS FOR POLICY:

- If a carbon price is put on heating fuels, low-income households (who are already consuming less energy than the average households) may respond by further sacrificing thermal comfort, which could lead to a range of physical and mental health issues as described above, in the absence of structural changes to their homes and heating systems.
- A price signal will not lead low-income households to invest in structural measures, due to their inability to cover the costs and their exclusion from the financial markets.
- However, carbon pricing raises revenues that can be used to support low-income households to invest in clean solutions which can allow them to participate in the transition to more efficient and comfortable homes, provided that a full financing of these solutions and other types of support are available for them.

17 Split incentives refer to a situation on the rental market where those responsible for paying the energy bills (the tenant) are not the same entity as those that make the investment decisions (the building owner). It should be noted that the housing sector of the ten countries studied all have a smaller rental segment than the EU average of 30.3%. Nonetheless, in some of these countries, there is a sizeable share of people living in rented homes, such as Greece (26.1%), Italy (24.9%), Spain (24.9%), Portugal (22.7%), and Czechia (21.1%).

MINIMUM ENERGY PERFORMANCE STANDARDS ARE A NO-REGRET OPTION

Scenarios where there is an introduction of minimum energy performance standards (at least energy label E by 2033 and energy label D by 2040), either as a standalone policy or in combination with other policies, show a fall in energy consumption and subsequently energy costs. This is because such standards would accelerate energy renovations in the worst-performing buildings. When minimum energy performance standards are introduced on their own, the energy costs in 2050 are on average 19% lower across the ten countries compared to when no additional policies are implemented by 2050 (see Figure 6). If the standards are introduced in combination with a phase-out of fossil fuel boilers, the energy cost reduction is 30% on average compared to the baseline in 2050. In calculating the energy costs in both scenarios, the investment costs incurred by low-income households to meet the minimum energy performance standards are not included. The investment needs are listed as a separate cost category (see Figure 7).

ENERGY COSTS WOULD FALL FOR LOW-INCOME HOUSEHOLDS AS HOMES UNDERGO ENERGY RENOVATIONS

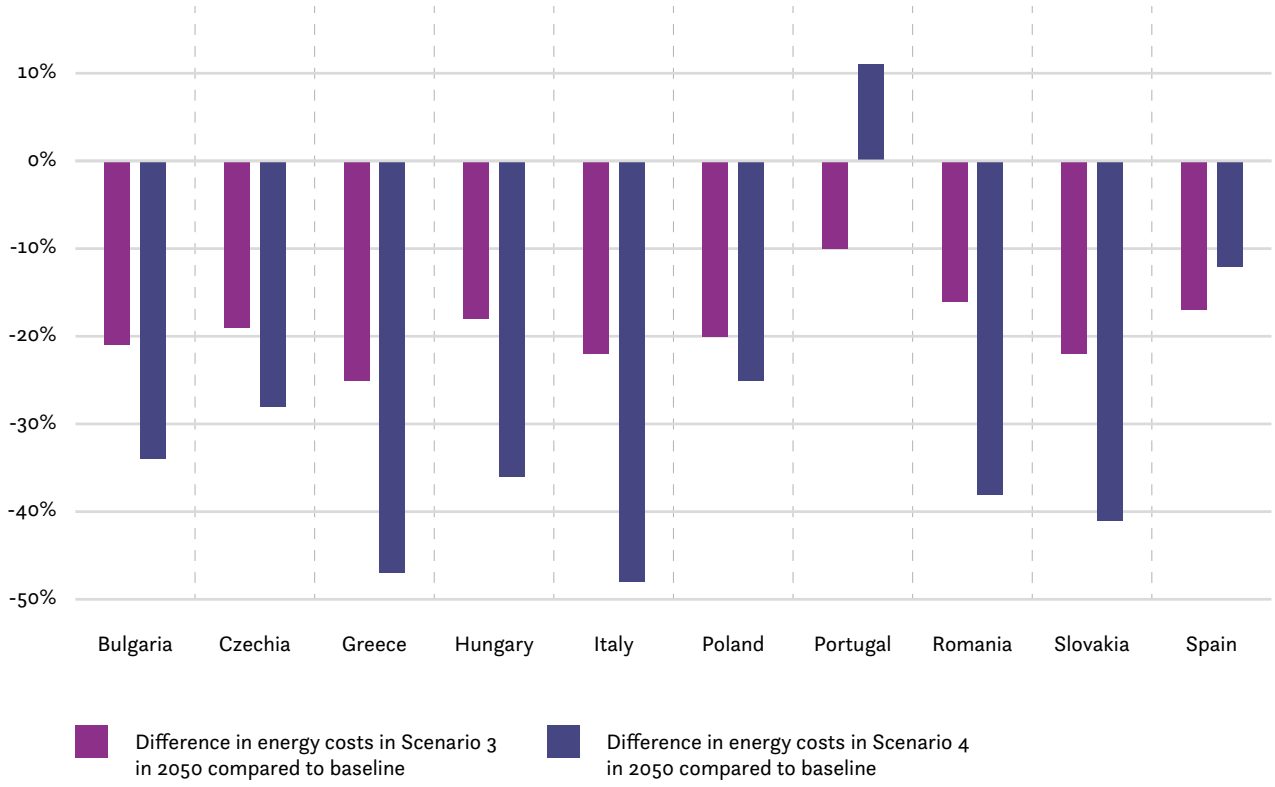


Figure 6: Difference in total energy costs in low-income households in 2050 between business as usual and when minimum energy performance standards are introduced either alone or in combination with a phase-out of fossil fuel boilers.[18]

18 In Portugal, a combination of fossil fuel boiler phase-out and minimum energy performance standards will lead to an increase in energy costs in 2050. This is because among low-income households, the current use of fossil fuel boilers for space heating is minimal, as the vast majority of the thermal needs are covered by biomass and electricity (including ambient heat). A similar picture exists for domestic hot water (with slightly higher use of natural gas for hot water compared to for space heating, despite still representing a small portion of the energy mix). Consequently, the impact of the fossil fuel boiler phase-out on energy use is expected to be minimal. The reduction in energy costs in 2050 would mainly result from the introduction of minimum energy performance standards in Portugal.

Using the example of Italy, Figure 7 shows that the energy consumption of low-income households is declining steadily from 2019 to 2050 as buildings undergo energy renovations, in the scenario where minimum energy performance standards are implemented on their own. This also translates into a reduction in energy costs. An investment of €31 billion, spread over the 2025–2040 period, would be required in Italy to meet the standards and realise the energy cost reduction.

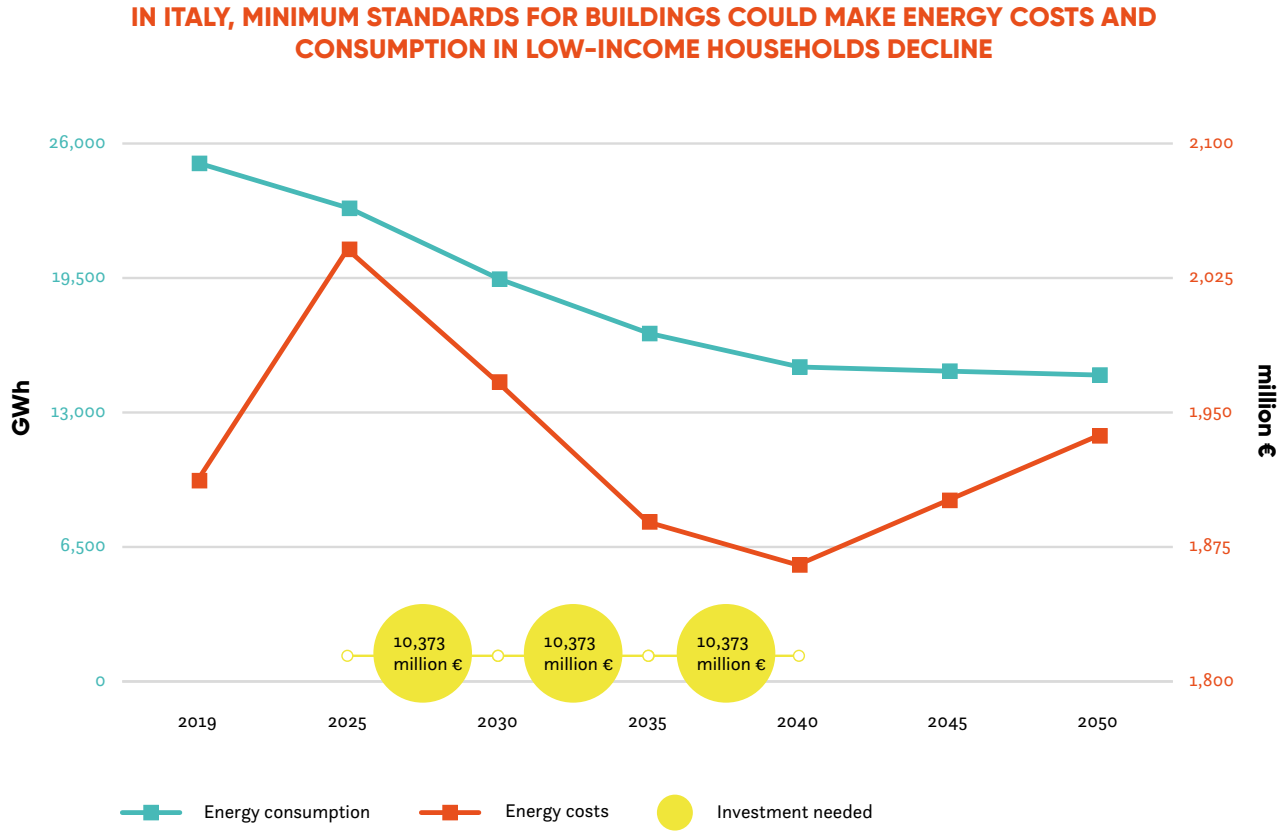


Figure 7: Energy costs, investments (€ million) and consumption (GWh) in Italy with the introduction of minimum energy performance standards for existing buildings (2019-2050).

Note: It should be noted that the energy costs will increase in the period of 2040-2050 despite the reduction in energy consumption, as a result of the projected increase in the price of heating oil, natural gas, solid fossil fuels, electricity and LPG over time.

Introducing minimum energy performance standards to upgrade the worst performing buildings to energy class E by 2033 will improve the quality of life of low-income households, as most of the poorly insulated buildings are occupied by low-income groups (75% in the study's assumption). With over a fifth of European households at risk of poverty[19] living in a dwelling with leaks, damp and rot, close to one in ten living in severe housing deprivation and 38.4% overburdened with housing costs in 2020,[20] improving the energy performance of their homes will help tackle inadequate and insecure housing as one of the root causes of energy poverty and contribute to better living conditions, generating important social and health gains.

However, improving a building's energy label from G and F to E will not significantly enhance the quality of life of low-income households even if it represents an initial step in the right direction. This study modelled a further milestone of achieving energy label D by 2040, which should be the standard compatible with a phase-out of fossil fuel heating by 2040 as included in the European Commission's EPBD proposal. The standard in 2040 could potentially trigger deeper energy renovation well before the deadline if the right support is in place for households, as households may not wish to renovate their homes twice within the same decade.

19 Households at risk of poverty are considered to be those earning below 60% of median equivalised income, according to Eurostat's methodology.

20 Based on 2020 data from the European Union Statistics on Income and Living Conditions.

CONSIDERATIONS FOR POLICY:

- As low-income groups predominantly live in the worst energy performing buildings, having a mandatory standard to upgrade these buildings by a set deadline would target the homes of these groups and improve their living conditions. Benefits for low-income households may be in the form of more thermal comfort rather than savings on energy bills if they were previously underheating their homes.
- To significantly improve the quality of life of low-income households, there should be further milestones requiring deeper renovation beyond 2033. There is a risk that low-income households would be left behind in homes that have undergone modest improvement in the building envelope in the absence of higher ambition on minimum energy performance standards further down the line.
- Introducing minimum energy performance standards for existing homes, accompanied by financial and technical support as well as one-stop-shops to undertake the renovation, would drastically reduce the energy bills of low-income households and/or bring these households more thermal comfort and better health. The financial support to help low-income households renovate their buildings could come from the Social Climate Fund and the use of national revenues under the existing emissions trading system as well as from revenues from the proposed new emissions trading system for buildings (see also section below on investment needs).
- Enabling framework conditions at the national level on top of technical and financial support would be needed for minimum energy performance standards to deliver energy bill savings and improve living conditions of low-income households. These include, for example, tackling the split incentives dilemma, rent caps to maintain the affordability of housing, and better protection for tenants.
- As many low-income households are tenants in countries with a sizeable rental sector, it is important that the introduction of minimum energy performance standards is coupled with similar support for the property owners of buildings occupied by low-income households.

A COMBINATION OF POLICIES WILL EVENTUALLY MAKE IT CHEAPER FOR HOUSEHOLDS TO HEAT THEIR HOMES AND INCREASE THEIR DISPOSABLE INCOME

Energy costs: If an emissions trading system for the building sector, a phase-out of fossil fuel boilers and minimum energy performance standards for buildings are introduced and low-income households receive full public funding support to cover the investment needed, they will benefit from a 34% reduction in energy costs in 2050 compared to 2019 (see Figure 8) on average. Introducing all three policies simultaneously will also result in the lowest energy costs in 2050 compared to implementing only one or two of the policies (see Figure 9). Despite higher energy prices due to the introduction of an emissions trading system for buildings[21], a switch to clean heating will cushion the impact of the price increase while buildings with better energy performance will lower energy demand overall.[22]

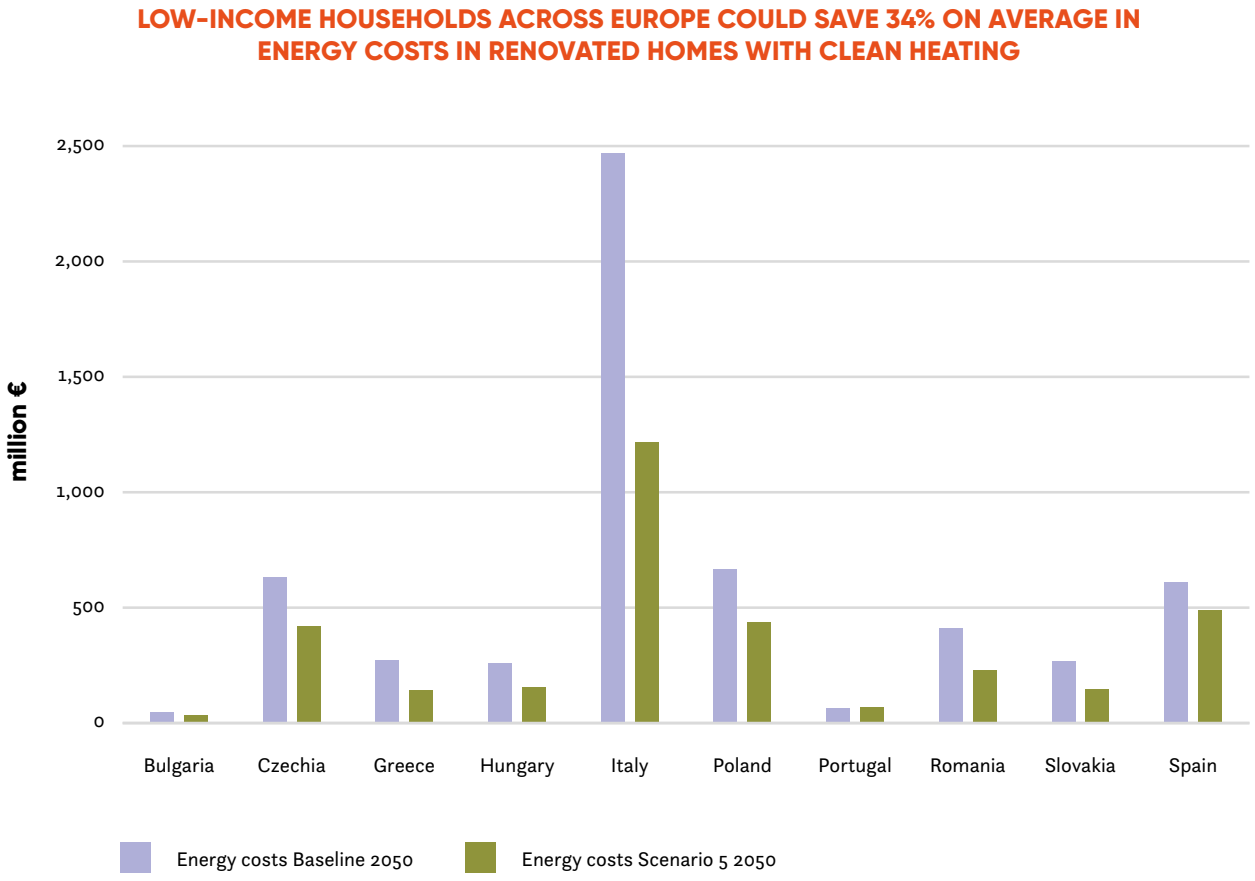


Figure 8: Energy costs (€ million) of low-income households in 2050 under the business-as-usual scenario and the scenario with the combination of three policies.

21 Cornago, Elisabetta, 2022, The EU Emissions Trading System After the Energy Price Spike, Centre for European Reform *https://www.cer.eu/sites/default/files/pbrief_ets_EC_4.4.22.pdf*

22 As mentioned above, in calculating the energy costs in both scenarios, the investment costs incurred by low-income households to undertake energy renovations and switch to clean heating are not included. The investment needs are listed as a separate cost category

A COMBINATION OF CLIMATE POLICIES FOR THE TRANSITION TO CLEAN HEATING AND ENERGY EFFICIENT HOMES WOULD DELIVER THE HIGHEST SAVINGS ON ENERGY BILLS FOR LOW-INCOME HOUSEHOLDS

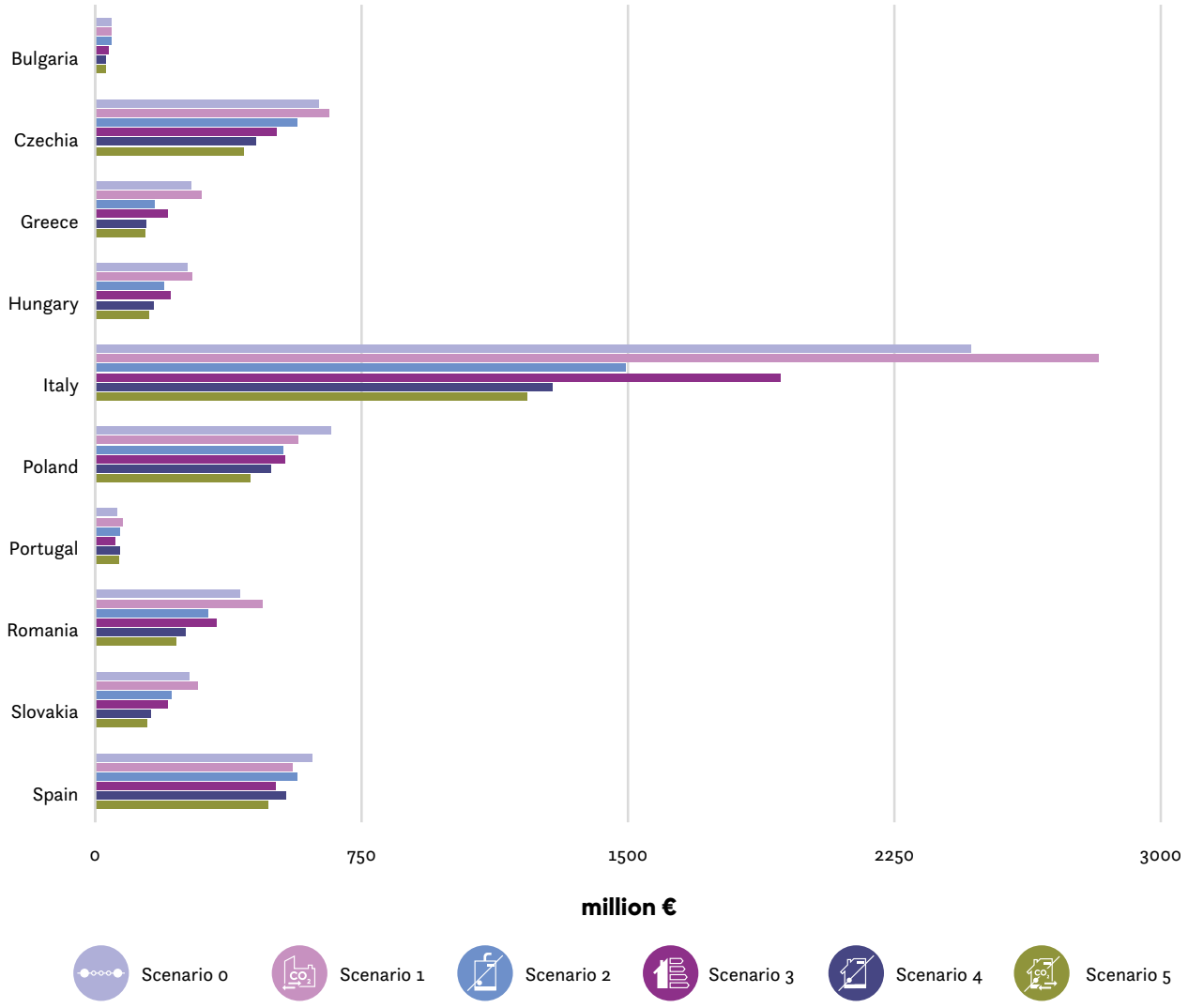


Figure 9: Energy costs (€ million) of low-income households in 2050 under the different scenarios.

Disposable income: Implementing the three policies, combined with providing sufficient support to low-income households in making the switch to clean heating and to insulate their homes, means that low-income groups will have more disposable income in 2050 compared to not implementing these policies. When the three policies are introduced together, disposable incomes would increase the most compared to the implementation of only one or two of the policies in the medium to long run. Disposable incomes of low-income groups will be lower than in the baseline in 2050 when an emissions trading system for buildings is introduced as a standalone measure and the resulting revenues are not invested in energy renovations and heat pumps.

A COMBINATION OF CLIMATE POLICIES TO UPGRADE HOMES COULD UNLOCK MORE DISPOSABLE INCOME FOR THE POOREST IN EUROPE

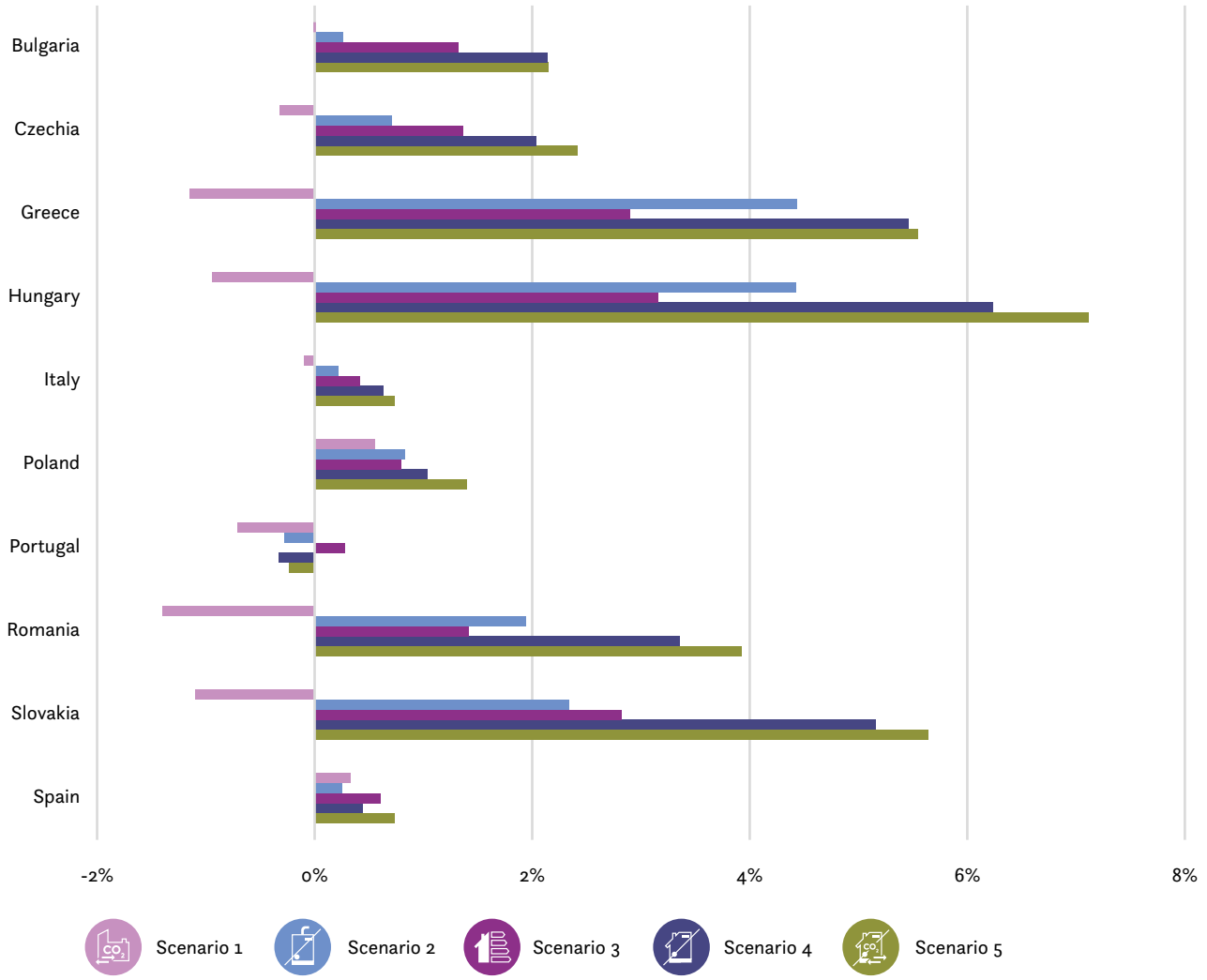


Figure 10: Change of disposable income of low-income households in 2050 under different scenarios compared to business-as-usual.

With the investment in energy renovation and clean heating fully covered by public funding, low-income households will not only have more disposable income by 2050 but will also benefit from other positive effects due to the policies introduced (see Box 1).

BOX 1. EXAMPLES OF CO-BENEFITS OF ENERGY RENOVATION AND CLEAN HEATING

1. **Reduced health costs associated with domestic fossil fuel burning**. The total health-related costs to society of outdoor air pollution due to residential heating and cooking in Europe amounted to €29 billion in 2018, mainly due to fossil fuel and wood burning (equivalent to €130 per year for an average European household). A switch to heat pumps powered by renewable (non-biomass) electricity and induction cooking would eradicate these costs. In the following countries, the total health related social costs of outdoor air pollution due to domestic heating and cooking in 2018 are:[23]
   - Poland: total costs €3.3 billion, equivalent to €228 per year per household
   - Italy: total costs €4.7 billion, equivalent to €180 per year per household
   - Spain: total costs €1.2 billion, equivalent to €65 per year per household

   Indoor air quality can also be improved, especially when fossil fuel and biomass burning is coupled with improper ventilation, which is more likely to be the case for low-income groups.

2. **Better physical and mental health due to improved living conditions**. Across Europe, the energy-poor population is more likely to report poor health and emotional well-being than the non-energy poor population, with a higher incidence of bad and very bad health, poor emotional well-being, and depression.[24] The reasons for this are multiple: cold homes, damp, mould, draft through doors and windows, and the mental effects of constant worries about arrears, price increases, etc. Better insulated homes, together with more efficient heating appliances, will alleviate energy poverty which is a contributing factor to health problems.

3. **Improved social inclusion.** Living in energy poverty has implications for self-perception[25] and disposable income. It heightens feelings of social exclusion and isolation, the former due to self-isolation and the latter because of the inability to pay for the participation in social events. Lifting households out of energy poverty can therefore have a positive impact on their social life.

4. **Employment generation**. It has been estimated that for every €1 million invested in the energy renovation of buildings, an average of 18 jobs are created in the EU. These are local, long-term jobs that will stimulate economic activity across the EU.[26]

23 CE Delft 2022, Health-related social costs of air pollution due to residential heating and cooking in the EU27 and UK, *https://cedelft.eu/publications/health-related-social-costs-of-air-pollution-due-to-residential-heating-and-cooking/*

24 Thomson H, Snell C, Bouzarovski S. Health, Well-Being and Energy Poverty in Europe: A Comparative Study of 32 European Countries. Int J Environ Res Public Health. 2017;14(6):584. Published 2017 May 31. doi:10.3390/ijerph14060584

25 Stefan Bouzarovski, Sergio Tirado Herrero, Saska Petrova & Diana Ürge-Vorsatz (2016) Unpacking the spaces and politics of energy poverty: path-dependencies, deprivation and fuel switching in post-communist Hungary, Local Environment, 21:9, 1151-1170, DOI: 10.1080/13549839.2015.1075480

26 Renovate Europe 2021, Building renovation: a kick-starter for the EU recovery, study prepared by the Building Performance Institute of Europe, *https://www.renovate-europe.eu/wp-content/uploads/2020/06/BPIE-Research-Layout_FINALPDF_08.06.pdf*

CONSIDERATIONS FOR POLICY:

- A mutually reinforcing combination of building regulations to increase energy renovations, a phase-out of fossil heating and the introduction of a carbon price creating revenues would be beneficial for low-income households as it would reduce their energy costs compared to business as usual, in addition to providing a wider range of environmental, social and economic benefits.
- Revenues from carbon pricing on heating fuels would need to be invested (with a high subsidy rate) in the decarbonisation of buildings owned or occupied by low-income households and used to help cover any increase in energy costs, to empower these households to participate in the energy transition.
- A Social Climate Fund and national financing schemes that start a few years before a carbon price on heating fuels comes into effect could enable low-income households and owners of buildings occupied by low-income households to insulate their homes and switch to clean heating. This would allow them to be less negatively impacted by higher fuel prices. Various briefings have made suggestions as to where the funding could come from in this case.[27]

THERE IS A NEED FOR MORE THAN JUST THE EXPECTED REVENUES FROM AN EMISSIONS TRADING SYSTEM FOR BUILDINGS TO COVER THE INVESTMENT NEEDS OF LOW-INCOME GROUPS

Implementing a combination of the three policies will require large investments. For all the countries studied, the investment needs peak in 2030–2040. The total investment needs for all countries combined in this decade would be more than double the investment needs during 2025–2030 (see Figure 11). Overall, the investment needs in the 2025–2040 period exceed the national revenues[28] from a new emissions trading system for buildings and the Social Climate Fund.[29] Within this total there are national variations. In Bulgaria, Italy and Portugal, the carbon pricing revenues and the Social Climate Fund could potentially cover the investment needs if they are fully earmarked for this purpose, whereas in other countries (in particular Czechia and Hungary), the investment needs are (far) greater than the available revenues and fund.

In all cases, it is important to note that both the emissions trading revenues and the Social Climate Fund, as they currently stand in the European Commission's proposals, are not earmarked for renovating the homes of low-income households. They will be spent on reaching a wider range of objectives, such as tackling transport poverty, renewable energy projects and helping vulnerable households (which can be a broader group than first income quintile households) as well as businesses.

27 See for example Defard, C. 2021, A Social Climate Fund for a fair energy transition, briefing for the Jacque Delors Institute, *https://institutdelors.eu/wp-content/uploads/2021/10/PB_211006_A-Social-Climate-Fund-for-a-fair-energy-transition_Defard.pdf*; WWF European Policy Office 2021, Social Climate Fund – the potential to deliver more, *https://wwfeu.awsassets.panda.org/downloads/wwf_scf_position_paper_final.pdf*

28 The distribution of allowances is based on the average emissions from 2016-2018 (proposal by the European Commission).

29 The calculation is based on the European Commission's Social Climate Fund proposal in terms of the total amount of the fund and the allocation key.

THE INVESTMENT NEEDS FOR RENOVATION AND SWITCH TO CLEAN HEATING WOULD EXCEED THE NATIONAL REVENUES FROM A NEW EMISSIONS TRADING SYSTEM FOR BUILDINGS AND THE SOCIAL CLIMATE FUND

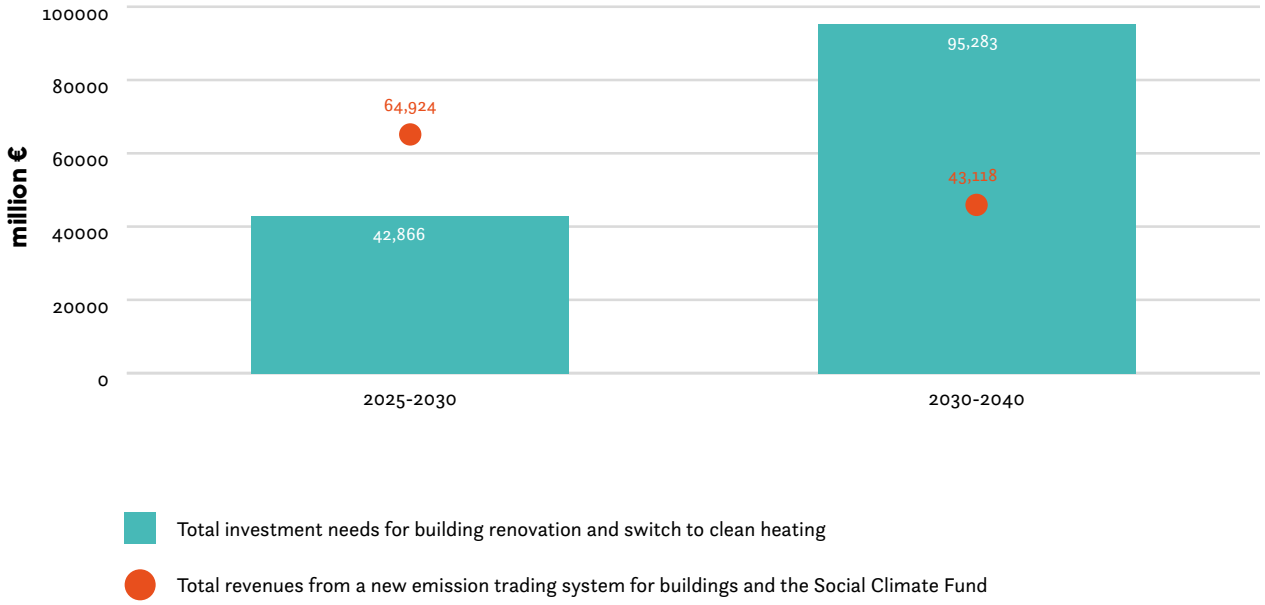


Figure 11: Investment needs for building renovation and the switch to clean heating in the 10 countries in 2025-2030 and 2030-2040, compared to forecasted revenues from a new emission trading system for buildings and the Social Climate Fund (€ million).

Other EU funding instruments are available that could be used for helping low-income households, such as the Modernisation Fund, the Recovery and Resilience Facility and the Just Transition Fund. Nonetheless, none of these funding instruments are earmarked for (directly) tackling energy poverty and tend not to be used as such.

For example, the Recovery and Resilience Funding plans in the ten countries studied do not foresee concrete actions or budget allocations for low-income groups or energy poverty alleviation. Indirectly, these plans include a budget for broader energy efficiency programmes (with an average financing rate of 40–50%), without targeted support for low-income groups. Similarly, the Modernisation Fund and the Just Transition Fund are not earmarked for energy poverty purposes and are allocated to various competing objectives and beneficiary groups.

In addition, a proportion of revenues from the current Emissions Trading System, under which a carbon price has been placed on district heating and electricity-based heating, could be spent on decarbonising buildings. Building renovation programmes funded by current emissions trading revenues have been implemented in Germany ("Federal Funding for Efficient Buildings") and Czechia ("New Green Savings).[30]

Experience from past renovation programmes shows that, when provided in a non-targeted manner, energy efficiency subsidies tend to be taken up by households that do not fall in the lowest income groups. This is because accessing such funding often requires co-financing and/or upfront financing, as well as going through complex administrative procedures. To enable low-income groups to make use of the financing, 95–100% of the investment needs should be covered (as shown to have been a success in renovation programmes to lift people out of energy poverty in Lithuania[31] and Estonia[32]).

30 The current phase of the New Green Savings programme is funded under the Recovery and Resilience Facility.

31 https://renovate-europe.eu/wp-content/uploads/2017/03/REC-Briefing-note-v4-1-2017.pdf

32 https://www.feantsa.org/public/user/Resources/reports/Targeting_Energy_Efficiency_Renovation_Report.pdf

CONSIDERATIONS FOR POLICY:

- Given the particularly high investment needs in the 2030–2040 period, there is a need for additional financing to improve the energy efficiency of the building stock and to switch to clean heating systems from the next EU budget, from revenues from the current emissions trading system, as well as from a post-2032 Social Climate Fund.
- The Social Climate Fund has the potential to become the first EU fund dedicated to alleviating energy poverty. However, the study shows that more funding would be needed in addition to the Social Climate Fund in its currently proposed form if Europe's vulnerable households are to be supported in the energy transition.
- Spending plans (such as the Social Climate Plans, but also in some way the National Building Renovation Plans proposed under the EPBD recast) would be suitable tools for channeling investments into lasting solutions that improve the living conditions of low-income households, while reducing their energy bills. The plans need to sufficiently consider the needs of low-income groups by helping them overcome obstacles, for example by supporting them to cover the upfront costs and not just costs after the renovation is complete. This could be provided through targeted one-stop-shop services. Member States would benefit from more guidance on how to design and deliver renovation and clean heating programmes for low-income households. In parallel, there should be technical guidance and assistance for low-income households on how to access the Social Climate Fund (and other EU funding) and undertake renovation and a heating switch.

CONCLUDING REMARKS

Faced with a climate emergency and a social as well as energy security crisis, policymakers at EU and national level need to explore all options on the table that can lead to win-win-win outcomes in the short, medium and long term. The triple crises have direct consequences for European citizens, especially in their homes and on their pockets.

The Renovation Wave is an opportunity to put forward a triple-win solution. This study shows that through establishing a combination of building regulations and pricing mechanisms, and through providing the right type and scale of support, the EU can include low-income households in the energy transition. It can empower them to deploy effective and structural solutions that will improve their quality of life and help them move away from dependence on imported fossil fuels, while contributing to reducing GHG emissions from their homes.