
Ready for the Wave?

Overlooked aspects of the Renovation Wave Initiative

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Introduction

The Renovation Wave initiative announced by the European Commission is a broad and extensive programme with several objectives.¹ The initiative aims to accelerate deep energy renovations and decarbonize the building sector while promoting more sustainable building methods and addressing energy poverty as well as social issues like rent increases following renovation. This comprehensive approach is well deserved, given the scale and complexity of the challenge, and it creates many opportunities to promote a more sustainable building sector at the national level.

This is urgently needed as the building sector has an enormous impact on the climate and natural resources. Buildings are responsible for about 40% of the EU energy consumption and 36% of energy-related greenhouse gas (GHG) emissions. 75% of the EU building stock is inefficient and it is estimated that most of the existing buildings will still be standing in 2050.²

The Energy Efficiency First principle has been agreed by the EU as a fundamental principle applying to all policymaking. Reducing the energy demand of buildings is a crucial prerequisite for the decarbonization of the building sector, as it reduces the consumption of fossil fuels for heating and also enables a faster and more effective transition to renewable heating solutions.

Yet, progress in this area has been frustratingly slow. Renovation rates in Member States have been chronically too low for years. The landlord-tenant dilemma still remains unsolved as well as the problems of low-income and aged homeowners, holding back financing for energy renovation. The heating transition is not tackled seriously by governments, creating a high risk of replacing outgoing coal heat generation, e.g. in district heating systems, with fossil gas rather than renewables.

As a headline target, the Renovation Wave aims to at least double the renovation rate from 1% to 2% and in particular increase the share of deep renovations, which are currently at 0.2% of the building stock per year.³ It has to be noted, however, that we need energy renovation rates of 3% and above to realistically achieve a climate-neutral building stock by 2050. In particular, studies have shown that we need ten times the current deep renovations to achieve climate neutrality by 2050, and we also need to seriously tackle embedded emissions in building materials.⁴ The Commission will make a large number of legislative proposals and other initiatives over the coming years, which are summarized in Figure 1 below.

The Renovation Wave rightly also identifies building renovation as a massive opportunity for the post-Covid economic recovery. Funnelling investment into the building sector through instruments like the Next Generation EU Facility and national stimulus programs boosts employment and creates demand for local industries. An analysis by the international Energy Agency has shown that energy efficiency in buildings is the largest job generator per million euros invested.⁵ According to a recent forecast, up to 215,000 jobs could be created by 2050 in Germany alone by raising the renovation rate to 1.6%.⁶ As the Commission puts it, the aim is to “make renovation a win-win for climate neutrality and economic recovery”.

¹ European Commission (2020): A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives, Communication SWD(2020) 550 final, https://ec.europa.eu/energy/sites/ener/files/eu_renovation_wave_strategy.pdf

² Ibid.

³ Deep energy renovation is defined as a renovation that improves the energy performance by at least 60%.

⁴ BPIE (2020): On the way to a climate-neutral Europe – Contributions from the building sector to a strengthened 2030 climate target, <https://www.bpie.eu/publication/on-the-way-to-a-climate-neutral-europe-contributions-from-the-building-sector-to-a-strengthened-2030-target/>

⁵ IEA (2020): Sustainable Recovery – World Energy Outlook Special Report, <https://www.iea.org/reports/sustainable-recovery>

⁶ Holm & Maderspacher (2018) Wirtschaftliche Bedeutung der Gebäudehülle im Wohnungsbau, <https://buveg.de/wp-content/uploads/2020/11/FIW-Studie-Wirtschaftliche-Bedeutung-der-Geb%C3%A4udeh%C3%BClle-im-Wohnungsbau-April-20181.pdf>

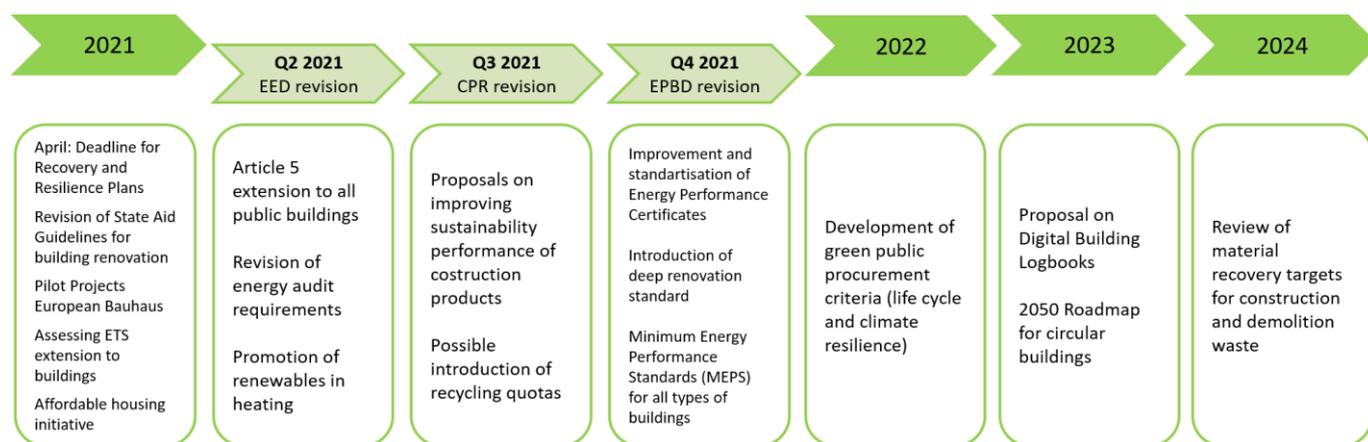


Figure 1: Timeline of the Renovation Wave

The Renovation Wave relies on a timely and ambitious implementation by EU Member States to work, however. Current legislation on buildings and energy efficiency has still not been implemented in many EU countries. The past performance of Member States in transposing the Energy Efficiency Directive (EED) and the Energy Performance of Buildings Directive (EPBD) has left a lot to be desired, with delayed implementation and infringement proceedings being very common. Germany, for instance, still does not meet the 2012 EPBD requirement that new buildings must be nearly zero-energy buildings. Progress on the updated Long-Term Renovation Strategies (LTRS), which are supposed to chart a path to climate-neutral building stocks by 2050, has also been slow. Only 17 out of 27 Member States having submitted their LTRS as of February 2021, even though the strategies were already due in March 2020. A first analysis of submitted LTRS has shown substantial need for improvement.⁷

Member States must step up their game to set the course towards climate neutrality in the building sector. Likewise, it is crucial for environmental organizations to act as watchdogs and raise the profile of the important and complex topic of sustainable buildings. In this background paper, Environmental Action Germany (Deutsche Umwelthilfe, DUH) highlights three areas of the Renovation Wave initiative that have received comparatively little attention but are nevertheless crucial to the overall success of the initiative: Circular buildings and life-cycle approaches, kickstarting a sustainable heating transition and the social dimension of energy renovation.

⁷ BPIE (2020) A Review of EU Member States’ 2020 Long-Term Renovation Strategies, https://www.bpie.eu/wp-content/uploads/2020/10/LTRS-Assessment_Final.pdf

Policy recommendations at a glance

Circular buildings and life-cycle approaches

- » Standards and norms to account for life-cycle emissions and circularity need to be developed urgently at the EU level, for example via the upcoming revision of the Energy Performance of Buildings Directive. It is concerning that the Commission only plans to make concrete proposals in this area in 2023 via the roadmap for circular buildings.
- » Minimum quotas for the use of recycled materials in building products, to be introduced with the upcoming EPBD revision, should apply to steel and cement as a matter of priority, as these are very emissions-intensive and are used as intermediate products in a wide range of applications.
- » The Commission should make it a priority to produce the Strategy for a Sustainable Built Environment in 2021, as announced in the Circular Economy Action Plan, to ensure the upcoming legislative initiatives work effectively towards an overall plan.
- » Material recovery targets for construction and demolition waste are not fit for purpose should be revised significantly earlier than 2024. We need separate quotas for recycling and reuse, rather than an overall quota including everything but landfilling.
- » Member States should use funds available through the Next Generation EU Facility, the Just Transition Fund and Cohesion Policy to finance recycling infrastructure development e.g. for industrial clusters, and boost workers' skills in the building sector.
- » In the absence of EU regulation, national, regional and local governments should set ambitious circularity standards in building codes and public procurement calls. The Level(s) framework provides a good starting point for this.
- » Member States should reform their tax regimes to price in the environmental costs of resource exploitation into primary resources, thereby setting economy-wide incentives to reduce carbon emissions, resource use and ecosystem degradation.

Kickstarting a sustainable heating transition

- » Binding Minimum Energy Performance Standards that eventually cover the whole building stock are essential to accompany the heating transition, which requires a drastic increase in the pace of energy renovation across Europe.
- » Policies at the Member State level must address the unfavourable price environment for renewable heat by adopting appropriate subsidy schemes and tax incentives, particularly for the installation of heat pumps and the conversion of district heating systems to renewable heat, while scrapping all subsidies for new fossil gas infrastructure.
- » Despite claims by the housing and gas industries, relying on green hydrogen to decarbonize heating is not a realistic option. Hydrogen will be a scarce commodity that will be needed in areas where there is no viable decarbonization alternative, such as industry or shipping.
- » The Commission should make it a focus in its upcoming legislative proposals to increase the price of fossil gas. Narrowing the gap between electricity and fossil gas prices through carbon pricing or energy tax reform would significantly accelerate the uptake of heat pumps and other renewable heating solutions.
- » Money from such sources as the Just Transition Fund and the Recovery and Resilience Facility should under no circumstances be used to fund fossil gas heating infrastructure. This would amount to further fossil lock-in, financed out of public coffers.

- » The revision of the Energy Efficiency Directive should tackle Article 14, which allows for the public support of “highly efficient” combined heat and power generation. In practice, the national CHP support schemes built on these provisions amount to fossil fuel subsidies that disadvantages renewable district heating, which receives no such support.
- » The upcoming revision of Ecodesign rules should set strict energy efficiency requirements to drive new oil and gas boilers out of the market, thus increasing the market share of heat pumps. These outdated individual heating systems are fundamentally incompatible with a climate-neutral building stock by 2050.
- » The Commission should propose an obligation for municipalities to adopt long-term heat systems plans based on climate targets to chart out the transition to sustainable heating. To address capacity gaps and constrained finances of municipalities, financial and technical support should be made available to them for this purpose, e.g. out of Cohesion Funds or the Next Generation EU fund.

The social dimension of energy renovation

- » Minimum energy performance standards targeting the worst-performing buildings will help alleviate energy poverty in the long run. In the short term, the affected households should be given financial assistance to deal with upfront renovation costs, as well as social safeguards to ensure their rent or energy costs do not rise as a result.
- » Most of the Long-Term Renovation Strategies as well as National Energy and Climate Plans handed in by EU Member States lack even a basic definition, let alone concrete measures to address the problem. Member States must urgently deliver on these basic requirements, which are a prerequisite to develop strategies and policies addressing energy poverty.
- » Targeted financial solutions must be made available for low-income households. Financing models should limit or eliminate upfront costs and ensure that energy renovations are cost-neutral in terms of rent and energy costs. Subsidy schemes should be based on grants and provide staggered financing rates, offering the most attractive funding conditions to the worst performing buildings.
- » Energy services such as Energy Performance Certificates and renovation passports should be offered to low-income households free of charge, either via grant programmes or as an automatic part of financial products for renovation, such as EIB and InvestEU loans.
- » Carbon pricing in the heating sector can have negative effects on poorer households, who often do not have the means to switch to low-carbon alternatives. The Commission should build in compensation mechanisms for low-income households in its expected proposals on carbon pricing for non-ETS sectors, to ensure that the measure does not have a socially regressive effect.

Circular buildings and life-cycle approaches

The challenge

The circular economy model is a fundamental departure from the throw-away business model that still predominates in the building industry and modern economies more generally. The traditional approach is based on the assumption that natural resources are cheap, abundant and easy to dispose of. This is unsustainable as we are fast approaching planetary boundaries in terms of climate change, ecosystem degradation and biodiversity loss.

A central idea of circular economy thinking is to address this by avoiding waste and closing material cycles. In practice, this means maintaining the use of products and materials for as long as possible, thus reducing the need to input new raw materials and dispose of large amounts of waste. This goes beyond mere waste management and recycling, also encompassing new materials made from waste products or renewable sources, as well as the documentation of building materials, so that buildings can later be used as material banks during renovation or demolition/dismantling.⁸

The **EU Waste Framework Directive** governs waste treatment and includes the **European Waste Hierarchy**, which is a crucial tool to evaluate different options to reduce the environmental impacts of waste. The waste hierarchy gives absolute priority to the prevention of waste, followed by reuse and recycling. From an environmental and resource-efficiency perspective, these options are far preferable to energy recovery (burning in waste incineration plants) and disposal. However, the pyramid has been challenging to apply in the building sector. First of all, minimizing building waste requires a much stronger focus on renovating existing buildings rather than building new ones. Waste prevention and re-usability also pose considerable challenges to the design of building products to ensure a long product life and later reusability. Re-usability and recycling also require a functioning recycling infrastructure as well as regulatory incentives, which are currently not in place.



Figure 2: European Waste Hierarchy⁹

⁸ See also the “Buildings as Material Banks” Project: <https://www.bamb2020.eu/>

⁹ “Waste prevention and management”, DG Environment website, https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm

The need to move to such a model is particularly obvious in the building sector, which is responsible for the **single largest waste stream in the EU**. In 2018, construction and demolition waste amounted to 374 million tons in the EU-28.¹⁰ In Germany, this constitutes more than half of all waste.¹¹

Nominally, recovery rates are high in the EU, with Member States generally meeting the 70% recovery target for construction and demolition waste set by the Waste Framework Directive (WFD) for 2020. However, this is mostly achieved by relying on **backfilling and low-grade recycling practices**, such as road construction. More complicated materials like old insulation are typically burned in waste incinerators or deposited in landfills. This is a far cry from truly circular waste management. While the existing recovery target is being met, it is clearly insufficient to incentivize higher-quality recycling of building waste at scale.

Taking a life-cycle view of buildings, embedded emissions become apparent as another major problem. These are GHG emissions occurring mainly in the production and disposal of building materials, rather than in the operation of buildings. **Embedded emissions from the building sector are estimated to account for 5-12% of the EU's total GHG emissions.**¹² Taking these emissions into account, the impact of the building sector is even more stark as the usual statistics on energy consumption and heating fuel emissions suggests. These emissions are currently under no form of regulation or emissions reduction obligation in the EU, even though analysis by the European Commission shows that these emissions could be reduced by 80% by achieving greater materials efficiency and relying on environmentally sustainable products.¹³ Figure 3 summarizes the various impacts of the EU building sector if the full lifecycle of buildings is taken into account.

Based on a building's full lifecycle, the building sector is responsible for:

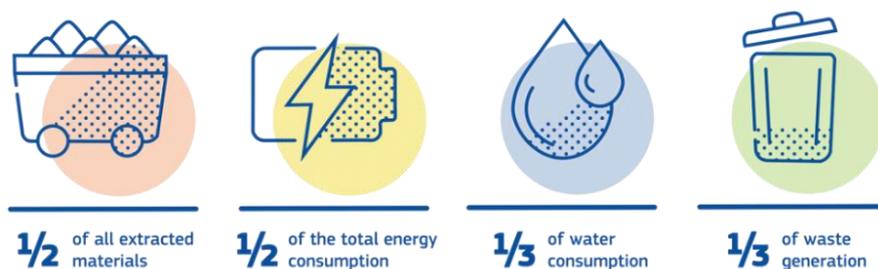


Figure 3: Building sector impacts in a life-cycle perspective¹⁴

Circular economy thinking in the building sector is still in its infancy. However, in principle, **many of the technologies needed to adopt a new model of circular building are already available**. There is a growing market e.g. for renewable construction materials and easily dismantlable wall constructions. Renewable construction materials such as timber have the added benefit of acting as a carbon sink, as trees absorb CO₂ during their growth phase. Recycling processes are technically feasible even for many problematic materials like HBCD-contaminated Styrofoam insulation, but they are not used at scale. Digital building is

¹⁰ See EEA Briefing (2020): Construction and demolition waste: challenges and opportunities in a circular economy, <https://www.eea.europa.eu/themes/waste/waste-management/construction-and-demolition-waste-challenges>. Statistic excludes excavated soil.

¹¹ Bundesverband Baustoffe (2016): 11. Monitoring-Bericht der Bauwirtschaft, <https://kreislaufwirtschaft-bau.de/Arge/Bericht-11.pdf>

¹² DG GROW website "Buildings and construction", https://ec.europa.eu/growth/industry/sustainability/built-environment_en

¹³ Ibid.

¹⁴ Level(s) website, https://ec.europa.eu/environment/topics/circular-economy/levels_en

also advancing in strides, with Building Information Modelling (BIM) and circularity passes enjoying increasingly widespread use, especially in larger building and infrastructure projects. Many pilot and best practice projects of fully or largely circular buildings already exist.¹⁵

While it is certainly crucial to adopt sustainable construction methods and materials in new buildings, it is much more important to focus on renovating old buildings, rather than demolishing them to build new ones. Increasing the amount of renovations relative to demolitions and new constructions is maybe the most effective step Europe could take to reduce building sector waste generation and resource use.

Applying circularity principle faces considerably greater obstacles in the building stock than in new buildings, however. Clean deconstruction and reuse of materials was almost never a consideration in the original construction and high-quality documentation of used materials is simply not available on most cases. Composite materials and adhesives, which are still commonly used, predominate in the building stock, which makes it very difficult to cleanly separate materials for later recycling. Innovations like urban mining projects and market platforms for secondary building materials, however, offer perspectives to preserve some of the resources used in old buildings.

Even though such solutions exist and new buildings can in principle be constructed to be fully circular already, the market penetration of such approaches is still very low. They are being held back in particular by a **multitude of market barriers and an unfavourable regulatory environment**. Recycling products compete with new products using primary resources, which are often cheaper as the environmental costs of using them are not internalized and they don't require intensive processing and preparation. A market for standardized secondary building products simply doesn't exist yet, and neither does the necessary recycling infrastructure. Due to regulatory barriers or missing regulation, secondary building materials are generally treated as waste rather than reused. This is compounded by a lack of knowledge on sustainable building approaches and a lack of trust in the quality of secondary materials on the part of stakeholders, as well as the slow uptake of circular and sustainable building training programs in the building sector.

What to expect from the Renovation Wave

The Renovation Wave and the Circular Economy Action Plan¹⁶ include a range of actions aiming to strengthen the market for secondary raw materials, improve the collection of life cycle and materials data on buildings and mainstream circularity criteria.

In Q3 2021, the Commission plans to propose revisions to the **Construction Products Regulation**¹⁷ to address the sustainability performance of construction products. In this context, it will also consider the introduction of mandatory recycled content requirements for specific construction products, which would be a key step to create demand for recycling products and secondary materials. This will be followed in Q4 2021 by a **sustainable products policy initiative including a revision of the Ecodesign Directive**. The

¹⁵ See e.g. here <https://www.bamb2020.eu/topics/pilot-cases-in-bamb/>, https://www.ellenmacarthurfoundation.org/assets/downloads/Venlo_-Case-Study_Mar19.pdf, or here https://www.ellenmacarthurfoundation.org/assets/downloads/Venlo_-Case-Study_Mar19.pdf

¹⁶ European Commission (2020) Circular Economy Action Plan, https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

¹⁷ Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC, OJ L 88, 4.4.2011

Ecodesign Directive has a much broader focus than buildings, but it will also address the sustainability of products like steel and cement.

Overall, concrete legislative proposals for circularity in 2021 will focus on the regulation of construction products rather than buildings. The Commission originally announced that it would also publish a **Strategy for a Sustainable Built Environment in 2021**. However, to date, the Commission has not followed up on its commitment, and the **strategy is not even included in the Commission's 2021 Work Programme**.¹⁸

The Commission will also propose several longer-term measures aiming to **mainstream and standardize circularity** based on the new **Level(s)**¹⁹ **framework for sustainable buildings**. The open-source framework aspires to be a “common language for building sustainability” by providing a set of standardized sustainability indicators. These include GHG emissions along a building's life cycle, construction and demolition waste and a bill of quantities of materials and their lifespans, as well as indicators on design for renovation and deconstruction. The Commission will develop training materials on the use of Level(s) in 2021.

Use of Level(s) is purely voluntary at the moment, but it will become increasingly central to the EU's efforts to promote circularity in buildings. By June 2022, the Commission plans to develop **green public procurement criteria**²⁰ **for public buildings** such as offices and schools, which are intended to include life-cycle assessments based on the Level(s) framework. This is particularly relevant as it is also foreseen to extend the obligation for central government buildings to achieve a renovation rate of 3% (EED Article 5) to all public buildings. The Commission will also make proposals on integrating Level(s) indicators into the EU's sustainable finance framework, so that dedicated financing instruments like green loan and mortgage financing can develop for circular building.

The Commission is planning a number of measures to **improve life-cycle and materials data on the building stock**. The long-term vision is to institute Digital Building Logbooks²¹ that will integrate all data from EPCs, the upcoming Building Renovation Passports, Smart Readiness Indicators which were introduced with the latest EPBD revision and, crucially, Level(s). The Commission will make **proposals on Building Renovation Passports and Digital Building Logbooks in 2023**. The upcoming revision of the Energy Performance of Buildings Directive (EPBD) in Q4 2021, on the other hand, will focus on energy savings in the operation of buildings. The Commission will also explore with Member States and stakeholders whether the European Building Stock Observatory can become central European data repository for the envisaged logbooks.

The Commission also plans to publish a **2050 roadmap for reducing whole life-cycle carbon emissions in buildings in 2023**, which will include greater details on many of these more long-term plans. By the end of 2024, the Commission will also **review material recovery targets for construction and demolition waste**, which are nominally being met but have not led to value-preserving recycling options being widely used for this waste stream.

¹⁸ https://ec.europa.eu/info/publications/2021-commission-work-programme-key-documents_en

¹⁹ DG Environment website “Introducing Level(s)”, <https://ec.europa.eu/environment/eusd/introducing-levels.htm>

²⁰ https://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

²¹ Volt et al. (2020): Definition of the Digital Building Logbook, Report 1 of the Study on the Development of a European Union Framework for Buildings' Digital Logbook, <https://op.europa.eu/en/publication-detail/-/publication/cacf9ee6-06ba-11eb-a511-01aa75ed71a1>

Policy recommendations

Moving the building sector to a truly circular business model will **require considerable changes in the regulatory environment** and a **culture shift in the industry**. Yet, the building sector is slow to change and characterized by long lead times. There is a delay of several decades between implementing action on new buildings and their effect on waste management, when a building is renovated or demolished. Therefore, to be able to achieve a climate-neutral building stock by 2050, it is essential to reduce embedded emissions and embedded energy as soon as possible. This means that we have to make changes now, as we will be stuck with the buildings we build and renovate now for decades to come.

Standards and norms to account for life-cycle emissions and circularity need to be developed urgently at the EU level. It is concerning that the **Commission only plans to make concrete proposals in this area in 2023** via the roadmap for circular buildings. Given the pace of EU policymaking and Member State implementation, the Commission's time table likely means a delay of several years until such standards actually apply in EU countries.

The **upcoming EPBD revision**, however, provides an opportunity to already define **regulatory standards on embodied emissions or embodied energy** of new buildings. This would also enable the development of special funding categories for sustainable renovation in energy renovation programmes. The Level(s) framework already includes an embedded emissions indicator, which could be used for this purpose and Environmental Product Declarations of building products already list renewable and non-renewable primary energy consumption or production. Such standards would not immediately have to be binding; they could in a first stage be optional and give access to preferential financing, or only apply to public buildings.

The Commission should furthermore make it a priority to **produce the Strategy for a Sustainable Built Environment in 2021**, as announced in the Circular Economy Action Plan. The strategy should lay out a credible pathway towards addressing the many linked but politically separate issues holding back building sustainability, e.g. in recycling and waste regulation, design of building products and heating systems, public subsidy schemes, and energy efficiency standards. Having a comprehensive strategy to improve building sustainability is crucial to ensure the upcoming legislative initiatives work effectively towards an overall plan, rather than introducing additional inconsistencies and loopholes.

The Renovation Wave, combined with the post-Covid stimulus measures adopted by the EU and Member States, will likely lead to a **boom for energy renovation in the building sector**. Where possible, deep renovations and new construction projects should thus already integrate circular economy considerations, e.g. by prioritizing natural and easily recyclable construction materials, dismantlable constructions, and recording materials data. This is particularly important for **standardized energy renovation models** to provide affordable renovation at scale, which the Commission is promoting heavily. Apart from the obvious focus on raising the renovation rate, Member States should also use funds available through the Next Generation EU Facility, the Just Transition Fund and Cohesion Policy to **finance recycling infrastructure development** e.g. for industrial clusters, and **boost workers' skills in the building sector**.

Likewise, **material recovery targets for construction and demolition waste are not fit for purpose** should be revised significantly earlier than 2024. Material recovery targets as currently defined include waste incineration, which actually acts as an impediment to recycling and reuse, while still allowing the construction industry to claim a high waste recovery quota. Incineration is often cheaper and easier than recycling or reuse, which typically requires complex-pre-treatment, e.g. in terms of sorting and separating materials from demolition waste. To address this, we need **separate quotas for recycling and reuse, rather than an overall quota including everything but landfilling**.

The key problem facing circular building products and approaches is that they compete with an industry practice that relies heavily on primary resources and typically does not take subsequent waste manage-

ment into account. In the current regulatory framework, the **external costs of primary resource exploitation, embedded emissions and subsequent waste management are not priced in**. To reach a truly competitive market for secondary resources in the building sector, additional measures will therefore be needed to create demand for circular products and buildings and address their competitive disadvantages.

Building codes and public procurement calls typically do not mandate e.g. that new constructions and renovations need to be reversible, have a waste management concept or address embedded emissions. Except if there is an explicit interest in sustainability on the part of the project developer, public or private, it is thus difficult to justify these additional expenses.

In the absence of EU regulation, national, regional and local governments can already act as trailblazers on building circularity, however. **Regional and national governments are free to set more ambitious standards** in building codes than the EU requires, e.g. by incorporating Level(s) indicators. All levels of government, but **local governments** in particular, can already **demand that circularity criteria are observed** in public procurement calls. The publication of green public procurement criteria in 2022 will be particularly helpful in actually implementing this at lower levels of government.²²

For many building products, such as concrete, chipboard or most insulation materials, using secondary materials in production is already technically feasible. It is thus very welcome that the Commission will propose **minimum quotas for the use of recycled materials in building products** with the upcoming revision of the Construction Products Regulation in 2021. However, such quotas must be ambitious enough to lead manufacturers to buy secondary building materials at scale. **Building products like steel and cement should be prioritised as one of the first set of products to be regulated this way**, because they are very emissions-intensive, their emissions are hard to abate, and they are used as intermediate products in a wide range of applications across the economy.

Environmental taxation is another measure that can address the price advantage of primary versus secondary resources. In the EU, only 0.3% of tax revenues stem from the taxation of resource use and pollution, with total environmental taxes only accounting for 6% of the revenues.²³ Tax regimes in EU Member States should be geared much more towards reducing carbon emissions, resource use and ecosystem degradation. Due to the EU's limited powers regarding taxation, this is an area where action by individual Member States is called for.

²² In Germany, there is already an obligation to prefer environmentally friendly materials in public procurement. However, this alone is not enough. Experience has shown that this has had little effect without providing local bureaucracies with the assistance they need to change procurement practices, e.g. with templates for procurement criteria or a pool of recognized environmentally friendly products.

²³ https://ec.europa.eu/environment/integration/green_semester/pdf/Session_report_5-4.pdf

Kickstarting a sustainable heating transition

The challenge

In the EU, heating and cooling represent approximately 50% of the total final energy consumption. 80% of the final energy consumption related to heating and cooling is still based on burning fossil fuels, making this sector very emissions intensive. The Commission estimates that about half of Europe’s heating system are already beyond their service lifetime. The **sustainable energy transition in the heating sector is currently lagging behind targets** and on the current course, buildings sector goals are unlikely to be met by 2030 and beyond.

According to the Commission’s impact assessment for the Climate Target Plan 2030,²⁴ the annual replacement rate of heating equipment would need to reach 4% in both the residential and services sector, while the share of renewables and waste heat would need to rise to 38-42%, compared to a 33% baseline scenario to meet the 2030 climate objective.

Phasing out fossil fuels in the heating sector is therefore a key challenge that faces an **enormous investment barrier: Asking millions of households to invest their own money** to switch to a different fuel, and also to improve insulation through energy renovation. At the same time, the current fossil-based heating system is held up by **powerful established actors and networks that have little incentive to change** the status quo.

To decarbonise the building stock will require significant improvements in energy efficiency and the adoption of renewable heating technologies. However, these technologies often have **very long life cycles that lead to substantial technological lock-ins and low replacement rates** (for example in buildings, building and heat infrastructures, gas- or district heating grids, power plants, etc.). Because buildings and their components are rarely replaced, they are among the slowest to decarbonize. Decisions that are being taken today are crucial when aiming to decarbonise the EU until 2050.

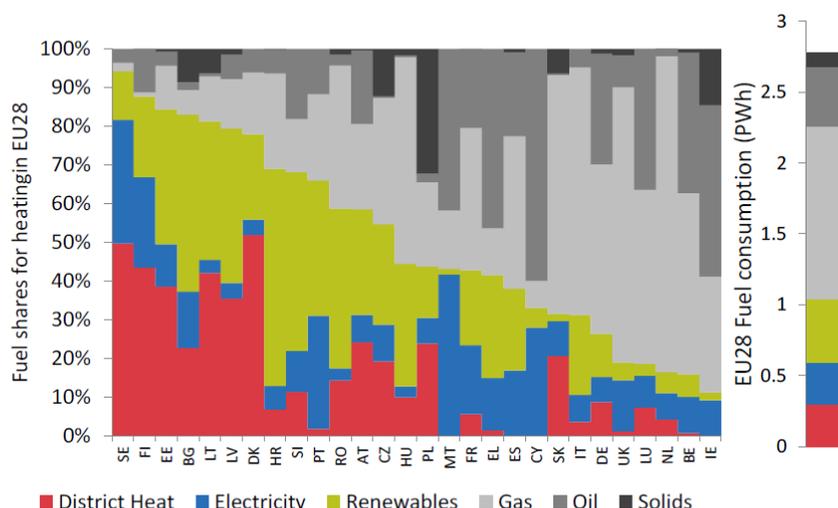


Figure 4. Fuel consumption for space heating in 2015. Member states are sorted by the amount of fossil fuels they are consuming

²⁴ European Commission (2020): Impact Assessment accompanying the Communication “Stepping up Europe’s 2030 climate ambition Investing in a climate-neutral future for the benefit of our people”, COM(2020) 562 final, https://eur-lex.europa.eu/resource.html?uri=cellar:749e04bb-f8c5-11ea-991b-01aa75ed71a1.0001.02/DOC_1&format=PDF

Figure 4: Fuel consumption for space heating in different EU Member States (solids refers mainly to coal)²⁵

There are several options available when it comes to renewable heating, each with its own advantages and disadvantages. As a rule, **a mix of different energy sources is necessary in order to ensure the heat supply all year round**. Solar and geothermal systems are among the most environmentally friendly heat sources, as well as environmental heat from the air, water or soil - brought to higher temperatures by heat pumps. Storage tanks can compensate for seasonal fluctuations in heat supply and allow electrical heat pumps to provide balancing services to the grid. Waste heat also offers great potential in many places. Biomass burning currently accounts for the vast majority of renewable heating, and while it is technically classified as renewable, it raises considerable environmental concerns. The massive support given by EU countries to bioenergy production has contributed to increased emissions, deforestation and food price rises.²⁶

While a lot depends on local context factors, two challenges in particular have to be addressed to create a fully decarbonized heating system. On the one hand, individual heating systems need to be electrified **by replacing gas or oil boilers with electric-powered heat pumps**. On the other hand, **district heating needs to be switched to renewables**. Despite claims by the housing and gas industries, **relying on green hydrogen to decarbonize heating is not a realistic option**. Hydrogen will be a scarce commodity that will be needed in areas where there is no viable decarbonization alternative, such as industry or shipping.

Heat pumps are the key technology needed to replace fossil-based individual heating systems. These must not only be used in new buildings, but also increasingly in the building stock. Because heat pumps need well-insulated houses to run optimally, this must go along with an increase in the speed and depth of energy renovation. However, heat pumps are far from being the standard technology being installed in new buildings today and they only account for 6% of heating systems replacements in existing buildings.

The **key factor inhibiting the spread of heat pumps is cost**. The initial investment required for a heat pump is much higher than for a fossil gas boiler. Fossil gas, on the other hand, is currently very cheap, weakening the business case of heat pumps. To run optimally from a consumer cost perspective, heat pumps also require good insulation, and flexible use of heat through energy storage, which increase the associated costs even further. Despite the high upfront costs, **heat pumps can help reduce fuel bills compared to conventional electric heating and have the potential to substantially cut emissions** compared with conventional electric heating or A-rated gas boilers.

District heating systems currently provide 12% of the EU's heat supply, with stand-alone heating systems accounting for the remaining 88%.²⁷ However, in many countries particularly in Eastern Europe and Scandinavia, district heating accounts for a much higher share. **Renewable district heating is still the exception and mainly based on an unsustainable level of biomass consumption**. In Germany, only about 15% of district heating is renewable. This share has been stagnating for years and is mainly based on biomass. Only about 1% of district heating in Germany does not require fuels, as it is produced from geothermal and solar thermal energy or environmental heat.

District heating can offer advantages for the integration of sustainable heat. It allows different heat sources including industrial waste heat to be combined. Large **seasonal storage facilities** can also be integrated, which helps make seasonal renewable heat available all year round. However, whether district

²⁵ Source: Kavvadias et al. (2019): Decarbonising the EU heating sector: Integration of the power and heating sector, <https://ec.europa.eu/jrc/en/publication/decarbonising-eu-heating-sector-integration-power-and-heating-sector>

²⁶ https://wwfeu.awsassets.panda.org/downloads/eu_bioenergy_policy_wwf_briefing_paper_final_4.pdf

²⁷ European Commission (2020): A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives, Communication SWD(2020) 550 final, https://ec.europa.eu/energy/sites/ener/files/eu_renovation_wave_strategy.pdf

heating or individual heating systems are more appropriate for a given situation must always be decided on a case-by-case basis.

Switching district heating systems to renewable heat is a challenge that needs to be resolved urgently, as there is a **high risk of new fossil fuel lock-in** in this area. In the course of the coal phase-out, many district heating operators are planning to switch to natural gas plants. According to a survey conducted by DUH in January 2021²⁸ current operators of hard coal-fired power plants are almost exclusively planning to switch to fossil gas rather than renewable alternatives. The main reasons for this are the **high subsidies for fossil heat generation** in combined heat and power plants as well as the **lack of subsidies and regulation aiming to promote non-biomass renewable heat**, as DUH has laid out in a recent position paper.²⁹

The conversion of district heating systems to renewables also faces considerable technical hurdles. Most district heating grids were built and designed many decades ago. They typically distribute heat at about 80°C and above to consumers. Operational temperatures cannot easily be lowered, as radiators need to be able to deliver sufficient heat to meet comfortable living temperatures and to allow for the safe preparation of domestic hot water. Such water provision limits potential temperature reductions due to the need to avoid legionella-related issues. Depending on specific national regulations, storage temperatures in the range of 55-75 °C are prescribed. **Sustainable district heating options, on the other hand, typically rely on low-temperature grids** and function best with wall or floor heating systems rather than traditional radiators. The conversion of individual and district heating systems to renewable heating is thus extremely complex and requires detailed planning at the municipal level.

In summary, significant investments from households, governments and private investors are needed for the heating transition to succeed, even to start in earnest in many places. The investment barriers are high, however. Among the most important are lacking ambition and uncertainties on future regulatory frameworks, and a biased subsidy landscape across EU member states which typically supports fossil CHP while offering no comparable support to renewable heating. Particularly in the context of Corona stimulus spending, there is currently a risk that much of the investment that could support renewable heating will flow instead into installing new fossil gas boilers and converting coal-based district heating to gas.

What to expect from the Renovation Wave?

The decarbonisation of the heating sector and the integration of renewables are considered cornerstones of the Renovation Wave. The Commission stresses that **only one fifth of the final energy consumed by heating and cooling is based on renewable energies** – most of it is renewable heat and a little more than 10% are heat pumps. An integrated approach to heating and cooling based on energy efficient electrification can help to reduce the dominance of fossil fuel-based solutions in the heating sector: first, because the share of renewables in the electricity mix is increasing and second, because it will reduce energy consumption for heating purposes.

The Renovation Wave aims to promote the decarbonisation of heating and cooling through the **2021 revisions of the Renewable Energy and Energy Efficiency Directives as well as the EU Emissions Trading System**, the application and further development of **eco-design and labelling measures**, as well as support to **district approaches**. The revisions aim to ensure that building renovation speeds up the integration

²⁸ <https://www.duh.de/presse/pressemitteilungen/pressemitteilung/deutsche-umwelthilfe-fordert-kohleausstieg-muss-zum-einstieg-in-gruene-fernwaerme-werden/>

²⁹ Available here: https://www.duh.de/fileadmin/user_upload/download/Pressemitteilungen/Energie/Fernw%C3%A4rme/210312_DUH_Policy_Paper_Gr%C3%BCne_Fernw%C3%A4rme_final.pdf

of renewables in particular from local sources, and promotes broader use of waste heat. It should also integrate energy systems at local and regional levels, helping to decarbonise transport as well as heating and cooling.

The Renewable Energy Directive, together with the Energy Efficiency Directive, require the Member States to provide the Commission every five years with their comprehensive **assessments of how to decarbonise their heating and cooling systems** using their potential for efficiency, renewables and waste heat. The relevant Renovation Wave initiatives on heating and cooling will certainly draw on these assessments, which are available on the European Commission’s website since December 2020.³⁰

Based on a thorough impact assessment, the revision of the **Renewable Energy Directive, to be proposed by June 2021**, will consider strengthening the existing renewable heating and cooling target in accordance with the new EU climate target for 2030. A requirement to use **minimum levels of renewables in buildings** is also planned. The revision will explore a toolbox of measures to promote advanced heating and cooling, including highly efficient low-temperature renewable and waste heat and cold technologies, to promote local and regional heating and cooling plans, and to address the barrier of high upfront capital investment.

The **revision of the Energy Efficiency Directive by June 2021** aims to strengthen the capacities of public authorities to prepare, finance and implement comprehensive heating and cooling planning in coordination with renovation projects. **Specific policy options to increase the efficiency in heating and cooling consumption**, together with the use of renewable sources, will also be proposed. As the current Energy Efficiency Directive framework does not sufficiently incentivise the uptake of efficient heating and cooling technologies, it could be strengthened for instance by introducing a requirement for municipalities to develop heating and cooling plans in line with climate and efficiency targets.

Commission proposals on revisions of the **Ecodesign Directive** and the product-specific eco-design and energy labelling delegated and implementing acts are also expected towards the end of 2021. These aim to improve environmental standards, provide the public with information on the most efficient products and steer financial incentives towards the best-performing devices.

Policy recommendations

When it comes to clean heating technologies such as heat pumps and renewable district heating (e.g. large heat pumps, sustainable biogas, solar, geothermal, or industrial waste heat) costs are still far too high. The almost complete lack of subsidies means that the costs of switching to renewable heating solutions are typically placed on households and home owners. To increase the share of sustainable solutions like heat pumps, **policies need to address the unfavourable price environment for renewable heat**. High electricity prices and higher upfront costs are still major barriers in most markets, while the alternative of fossil gas is cheap, partly due to fossil fuel subsidies and favourable electricity taxes.

This **imbalance must be addressed by Member States** reforming public support schemes to favour renewable heat, while at the same time imposing higher costs on fossil gas. Policy-wise, there must be continued **subsidies, tax incentives, and a further increase in carbon pricing to get things moving in the direction of sustainable heating**. This is only fair, given that public finance was and is also used to subsidise fossil infrastructure, distribution, appliances and fuel consumption. In particular, the EED revision should tackle Article 14, which allows for the public support of “highly efficient” combined heat and power

³⁰ https://ec.europa.eu/energy/topics/energy-efficiency/heating-and-cooling_en?fbclid=IwAR3E94i214VEGQc0cnWdzA4H4B7ZkA6bdV0tWsyER1dIDDxT8FexkiUDyQM

generation.³¹ In practice, the national CHP support schemes built on these provisions amount to fossil fuel subsidies that disadvantages renewable district heating, which receives no such support.

Narrowing the gap between electricity and fossil gas prices through carbon pricing or energy tax reform would accelerate uptake in market segments that are already expanding (e.g. air-source heat pumps for new buildings) and foster deployment in new market segments (e.g. existing buildings). This is particularly important to make breakthroughs at the household level as **millions of individual renovation and replacement decisions have to contribute to the heating transition**. There is a correlation between the energy-price ratio and the use of heat pumps: in the Scandinavian countries, for example, the price of electricity is low relative to fuel oil, and heat pumps have boomed. Policy measures and market incentive programmes have also helped to make heat pumps highly affordable for private consumers. Apart from influencing the price environment, another policy lever would be to use **Ecodesign rules to drive oil and gas boilers out of the market** with stricter energy efficiency requirements.

The European Parliament recently voted in favour of allowing funds from the Just Transition Fund³² and the Recovery and Resilience Facility³³ to be used for fossil gas projects. This creates a danger that the expected influx of investment into heating systems from the EU's Corona stimulus measures could lead to increased financing for natural gas heating infrastructure. In particular where district heating systems are transitioning away from coal, much of the investment that could support renewable heating could finance conversion to fossil gas instead. Money from such sources as the **Just Transition Fund and the Recovery and Resilience Facility should under no circumstances be used to fund fossil gas heating infrastructure**. This would amount to further fossil lock-in, financed out of public coffers.

Investments in the heating sector are long-term and involve launching new technologies on the market, or increasing the use of these technologies. As a result, this sector is in need of a **clear strategy and long-term goals** that give planning security for investment decisions. At the local level, **forward-looking planning** by municipalities is crucial to secure the necessary development areas and approach the needed technical adjustments of switching to renewable heat step by step and in a way that does not disadvantage poorer households. The **EBPD revision should include an obligation for municipalities to adopt long-term heat systems plans based on climate targets** to chart out the transition to sustainable heating. To address capacity gaps and constrained municipal finances, generous financial and technical support should be made available to municipalities for this purpose, e.g. out of Cohesion Funds or the Next Generation EU fund.

When discussing options for decarbonisation of the heating sector it cannot be stressed enough that **increased efficiency in buildings is essential for meeting these goals**. Final energy consumption in the building sectors needs to be reduced by at least a third before 2050 for any decarbonisation strategy to work. **Binding Minimum Energy Performance Standards (MEPS)** that eventually cover the whole building stock could be an important part of the Renovation Wave, ensuring that the sluggish pace of building renovation is not allowed to continue. Otherwise, the building sector will remain a huge barrier for effective climate protection in Europe.

³¹ For large and medium-sized installations, efficiency improvements of 10% are sufficient to be classified as highly efficient. Small installations can receive funding even with 0% efficiency improvements. Similarly, Article 7 EPBD allows Member States to financially support “high-efficiency alternative systems” for heating, which also includes CHP.

³² <https://www.euractiv.com/section/energy/news/parliament-votes-to-allow-gas-projects-in-the-just-transition-fund/>

³³ <https://www.euractiv.com/section/energy/news/lawmakers-set-to-ignore-environment-committee-and-open-door-for-recovery-funds-to-support-fossil-fuels/>

The social dimension of energy renovation

The challenge

It is estimated that more than 50 million households in the EU experience energy poverty.³⁴ According to the Commission, energy poverty is often described as the “inability to keep homes adequately warm”,³⁵ however, **energy poverty is a complex multi-dimensional issue that manifests in different ways** across households and Member States.

Households in energy poverty pay a considerable share of their income on energy bills and at the same time experience difficulties with satisfying basic energy needs. They often have to choose between drastic energy saving, which reduces their thermal and overall comfort, and paying their invoices at the expense of other important expenditure.

There is **no common European definition of energy poverty, but most Member States acknowledge the scale of this socio-economic situation** and its negative impacts – from severe health issues, through social isolation to environmental pressure resulting from using low-quality fuels and significant pollutants emissions from badly-heated and badly-insulated households.³⁶ On top of this, people who live in poorly-insulated houses are more exposed to cold spells, heatwaves and other climate impacts.³⁷ These factors also contribute to lower productivity, health problems and higher mortality and morbidity.

Energy poverty concerns both heat and electricity and is directly linked to energy consumption, generation (type of energy source used) and distribution. Apart from low household incomes, an **inability to satisfy basic energy needs comes can come from various sources**, including the inadequate development of energy infrastructure, characteristics of housing infrastructure (e.g. lack of thermal insulation, old and inefficient appliances) and low levels of energy awareness.

Tenants as well as homeowners can be affected by energy poverty. **Energy efficiency improvements are an effective way to tackle energy poverty as they reduce energy consumption** and costs in the long run. However, homeowners often face financing issues when it comes to improving the efficiency of houses and flats. In the rented housing sector, tenants and landlords face a user-investor-dilemma as landlords who do not profit from energy retrofits, have little incentive to invest. Tenants, who pay energy bills, on the other hand, have little to no influence on energy renovations and investment in heating systems. Renovation of social and multi-apartment housing faces additional barriers due to the often complex decision-making process needed before an energy renovation.³⁸

Energy poverty in figures

(% of EU population)

- **57 million** (13%) people can't keep their home adequately warm during winter
- **104 million** (23%) people cannot keep their homes comfortable enough during summer
- **87 million** (19%) live in poor-quality dwellings
- **52 million** (12%) people face delays in paying energy bills
- **34 million** (8%) people are unable to keep their homes adequately warm

Source: Eurostat (2021)

³⁴ <https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-poverty>

³⁵ <https://ec.europa.eu/energy/en/eu-buildings-factsheets-topics-tree/energy-poverty>

³⁶ https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-poverty_en?redir=1

³⁷ European Environment Agency, Report No 22/2018: Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe

³⁸ <https://ec.europa.eu/jrc/en/publication/energy-efficiency-upgrades-multi-owner-residential-buildings-review-governance-and-legal-issues-7-eu>

What to expect from the Renovation Wave

The EU made it a policy priority to tackle energy poverty and protect vulnerable consumers in the “Clean Energy for All Europeans” package in 2019. Energy poverty remains one of the priority areas also in the Renovation Wave³⁹, in which one of the key principles is “affordability and making energy-performing and sustainable buildings widely available, in particular for medium and lower-income households and vulnerable people and areas.” The Commission sees renovations as a lever to address energy poverty and access to healthy housing for all households.

It plans to kickstart renovation of social housing with the **Affordable Housing Initiative** in 2021, which will finance 100 district renovation projects that employ efficient, circular and modular processes. These projects are supposed to be implemented in concert with local stakeholders and businesses and provide a blueprint for replication. **Standardized industrial solutions for renovation**, also referred to as serial renovation, receive particular attention in the Renovation Wave communication. They are especially relevant in the context of social housing as they provide scalability and lower renovation costs.

The Renovation Wave proposes to improve access to financing for low-income households by increasing public grants and expanding private sector solutions that limit upfront costs. Other financing solutions the Commission proposes include micro-credits backed by a guarantee fund to promote fair cost-sharing between owners and tenants, on-bill financing schemes and on-tax financing schemes.

The Renovation Wave **builds on the assumption that there will be a huge influx of public financing** into renovation through instruments like the enlarged EU budget and the Recovery and Resilience Facility, and that LTRS and NECPs will guide these funds towards creating a climate-neutral building stock. However, the first RRP drafts, while they do include some additional funds for renovation, do not make renovation a priority⁴⁰ and the RRF flagship areas “Power Up” and “Renovate” are ultimately non-binding.⁴¹ The LTRS that Member States have handed in do not seem up to the challenge either.⁴² Original plans to institute a separate financing facility with earmarked funds for renovation had to be abandoned during negotiations on the Next Generation EU Facility as Member States insisted on a more flexible approach. Actual delivery of increased public funding for buildings – in combination with better funding conditions for poorer households and subsidizing energy services – will depend entirely on how the Member States allocate the additional funds.

Grants for energy renovation will play a larger role going forward, in particular through the increase in EU grants provided by the Next Generation EU Fund until 2026 and by the increased Just Transition Fund. Whether grants are available to renovate energy-poor dwellings and social housing will depend on how Member States use these additional funds. The Commission is also planning to **boost technical assistance programmes** and make them more widely available. In particular, the Commission will work with Member States and local authorities to replicate the ELENA⁴³ model, which provides grants for technical assistance in renovation projects, including for social housing and homeowner associations. The Commission will also propose to strengthen technical assistance in EIB and Invest EU loans, and to make it possible to combine loans and grants where this was not possible in the past. Under InvestEU, the Windows for Social

³⁹ European Commission (2020): A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives, Communication SWD(2020) 550 final, https://ec.europa.eu/energy/sites/ener/files/eu_renovation_wave_strategy.pdf

⁴⁰ <https://www.greenrecoverytracker.org/>

⁴¹ European Commission (2020) NextGenerationEU: Commission presents next steps for €672.5 billion Recovery and Resilience Facility in 2021 Annual Sustainable Growth Strategy, press release from 17 September 2020, https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1658

⁴² BPIE (2020) A Review of EU Member States’ 2020 Long-Term Renovation Strategies, https://www.bpie.eu/wp-content/uploads/2020/10/LTRS-Assessment_Final.pdf

⁴³ EIB website “ELENA – European Local ENergy Assistance”, <https://www.eib.org/en/products/advising/elena/index.htm>

Investment and Sustainable Infrastructure will provide **dedicated financial products** for energy renovation of buildings, including for social and affordable housing, as well as schools and hospitals.

The Commission will also use the **upcoming EED revision in Q2 2021 to propose to expand the use of energy service companies (ESCOs) and energy performance contracts** to facilitate renovation for households that have problems covering upfront costs. Energy performance contracts allow the funding of energy renovations from cost reductions. Under such an agreement, an ESCO that implements an energy efficiency project is repaid out of the ongoing energy savings during a building's operation.

The Commission will also publish a **Communication on the Long-Term Vision for Rural Areas in 2021** to address the specific challenges of rural and remote areas, including for energy renovation. In addition, money from the European Agricultural Fund for Rural Development will be made available to finance energy efficiency and renewable energy production in this area.

The Renovation Wave also aims to **more strongly involve social enterprises** due to their important role in tackling energy poverty at the local level through activities such as energy awareness campaigns, re-training unemployed people to energy poverty advisors or purchasing of energy-efficient appliances to rent out. Details on how this will work in practice are unclear, however.

Though not formally part of the Renovation Wave, the Commission will propose revisions to the Emissions Trading System and the Effort Sharing Regulation in Q2 2021, with the aim of **putting a price on carbon in the heating and transport sectors**. Among the scenarios considered are an extension of the ETS to these sectors or a separate emissions trading system. One downside of such approaches is that they **affect low-income households disproportionately by raising their heating expenses**. A study by Cambridge Econometrics has shown that extending the ETS could raise heating costs for low-income households by as much as 22%.⁴⁴ Compensation measures against such a rise would have to be adopted at the Member State level, and where such measures are not taken the potential to exacerbate energy poverty is considerable.

Policy recommendations

According to the Clean Energy for All Europeans Package, Member States must use their NECPs and Long-Term Renovation Strategies to identify dwellings of people at risk of energy poverty and develop effective strategies for renovating these as a matter of priority. The Commission reiterated these obligations in a **Recommendation on Energy poverty (14.10.2020)**⁴⁵: Member States should **assess the number of households in energy poverty**. In the case of a significant number of households in energy poverty, NECPs should include a national objective and policies to reduce energy poverty.⁴⁶ Member States are also called on to develop their own **criteria for defining energy poverty** in their national context by using the indicators outlined in the Annex to the Recommendation.⁴⁷

⁴⁴ Cambridge Econometrics (2020) Decarbonising European transport and heating fuels – Is the EU ETS the right tool?, www.transportenvironment.org/sites/te/files/publications/2020_06_Decarbonising_European_transport_and_heating_fuels_report.pdf

⁴⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020H1563&qid=1606124119302>

⁴⁶ The [EU Building Stock Observatory](#), the [EU Energy Poverty Observatory](#), the [Horizon Europe Mission on Cities](#) and the [EU Covenant of Mayors Office](#) can further assist Member States in identifying segments in need, and in linking renovation strategies to social indicators and policies to address energy poverty.

⁴⁷ A set of statistical indicators measuring likely drivers of energy poverty and its consequences has been developed at EU level and are listed in the Annex to the Recommendation.

However, the LTRS and NECPs currently handed in have massive gaps in regard to energy poverty. A recent analysis⁴⁸ of Croatia, Czechia, Hungary, Poland, Slovakia and Slovenia, where energy poverty is especially severe, has found that their NECPs do not even define energy poverty, which is the bare minimum required by the EU. Only Slovakia, Czechia and Croatia have even submitted their updated LTRS, which was due in March 2020.⁴⁹ **Member States must urgently deliver on these basic requirements**, which are a prerequisite to develop strategies and policies addressing energy poverty and the Commission must press them to do so, including via the threat of infringement proceedings.

The introduction of **minimum energy performance standards (MEPS) with the EPBD revision expected for the end of 2021** aims to ensure that the worst-performing buildings are renovated as a matter of priority. As there is a high overlap between low-income households and buildings with a poor energy performance, this will help alleviate energy poverty in the long run. However, in the short term, these households will need financial assistance to deal with the upfront costs of these renovations, as well as social safeguards to ensure their rent or energy costs do not rise as a result of renovation.

The needs of low-income households, which face particularly high barriers to accessing funding and investing in energy renovation, must therefore be reflected much more systematically in both national and EU funding schemes. **Targeted financial solutions must be made available** for these households. Financing models should limit or eliminate upfront costs and ensure that energy renovations are cost-neutral in terms of rent and energy costs. Subsidy schemes should provide staggered financing rates, offering the most attractive funding conditions to the worst performing buildings, which will particularly benefit poorer households. They should also be based on grants as much as possible, and be designed so they can be blended with private sector loans. Member States should institute priority renovation programmes for social and multi-apartment housing, where large efficiency gains can be realized, but where complex decision-making process typically pose an additional barrier to renovation.

The Commission is rightly pushing to expand the market for energy services, which are crucial to ensure high quality energy renovation tailored to specific circumstances. Energy consulting is the basis of EPCs and renovation passports and access to such services has been another hurdle keeping low-income households from renovating in the past. Especially if mandatory energy performance standards come in, **energy services should be offered to low-income households free of charge**, either via grant programmes or as an automatic part of financial products for renovation, such as EIB and InvestEU loans.

Finally, policymakers must not overlook the potential **impact of carbon pricing in the heating sector on poorer households**. There is a risk of penalizing low-income households, which often do not have the means to switch to low-carbon alternatives, and even making it harder for them to renovate by eating up disposable income. Whatever instrument is adopted at the EU level, **compensation mechanisms for low-income households must be built in** to ensure that the measure does not have a socially regressive effect. Such an outcome would seriously jeopardize public support for the low-carbon transition.

Conclusion

While the Renovation Wave includes many promising initiatives and shows forward-looking thinking on the part of the Commission, many details are still unclear and significant gaps remain. In particular, legislation on building circularity and life-cycle approaches should not be postponed to after 2023. Also,

⁴⁸ LIFE Unify (2020): Tackling energy poverty through National Energy and Climate Plans: Priority or empty promise?, https://caneurope.org/content/uploads/2021/01/Energy-poverty-report- Final_December-2020.pdf

⁴⁹ EU Commission website “Long-term renovation strategies”, https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies_en

fighting energy poverty should be an integral aspect of EU policy design, particularly regarding current plans to adopt a carbon price for heating and transport. The design of compensation mechanisms for low-income households facing rising heating expenses should not be left to Member States. Kickstarting a sustainable heating transition requires much broader changes than the Renovation Wave foresees as the current regulatory framework offers numerous advantages to fossil heating.

Overall, the success of the initiative in raising the renovation rate and achieving its other objectives relies heavily on Member States agreeing to ambitious changes in upcoming legislative revisions and then implementing these in national regulations. This is an area where national governments have previously lagged behind. Given the long-lasting effects of decisions in the building sector and the potential for carbon lock-in if funds are misallocated, Member States need to step up their game on boosting sustainable and socially fair energy renovation.

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