



EUROPEAN ALLIANCE TO  
**SAVE ENERGY**

*Creating an Energy-Efficient Europe*

# THE CHALLENGE OF DECARBONISING THE BUILDING AND HEATING SECTORS: CONSIDERATIONS ON CARBON PRICING



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THE CHALLENGE OF DECARBONISING THE BUILDING AND HEATING SECTORS:  
EU-ASE CONSIDERATIONS ON CARBON PRICING

MARCH 2021

Buildings are responsible for 40% of the CO<sub>2</sub> emissions in the European Union. According to the EU Renovation Wave Communication, to achieve the 55% GHG emission reduction target by 2030 the EU should reduce buildings' GHG emissions by 60%, their final energy consumption by 14%, and energy consumption for heating and cooling by 18%.

Energy efficiency should be the starting point for all decarbonisation efforts, in line with the Energy Efficiency First principle as defined in the Governance for Energy Union Regulation. Together with renewables, energy efficiency must represent the lion's share of the measures needed to meet the 2050 target. Energy efficiency and renewable electrification are two key pillars of a 1.5C decarbonisation pathway. This is particularly relevant in the building sector, given its decarbonisation potential and needs.

The Renovation Wave rightly underlines the importance of energy efficiency first as a horizontal guiding principle of European climate and energy governance. It also identifies decarbonisation of heating and cooling as one of its three priorities along with accelerating deep renovation of buildings and fighting energy poverty. Indeed, 28% of the total energy consumed in the EU is used in space and water heating. For the residential sector, more than 75% of the energy produced for heating currently comes from fossil fuels (gas, oil, and coal). As a result, CO<sub>2</sub> emissions from space and water heating represent 12% of the total EU emissions, as much as all cars in Europe combined<sup>1</sup>. Switching from fossil to low or zero-carbon fuels has an enormous potential in terms of CO<sub>2</sub> savings: by 2050, the potential from fuel switching is estimated at 291 Mt of CO<sub>2</sub><sup>2</sup>.

In this context, the European Union is discussing the opportunity to establish a carbon price on the building sector and the European Alliance to Save Energy would like to share the following recommendations.

1. ECOS, [How ecodesign and energy labelling can decarbonise heating](#).  
2. ECF, [Zero carbon buildings 2050](#).

## A thorough and informed assessment of different modalities of carbon pricing is necessary to gauge its potential benefits for the building sector

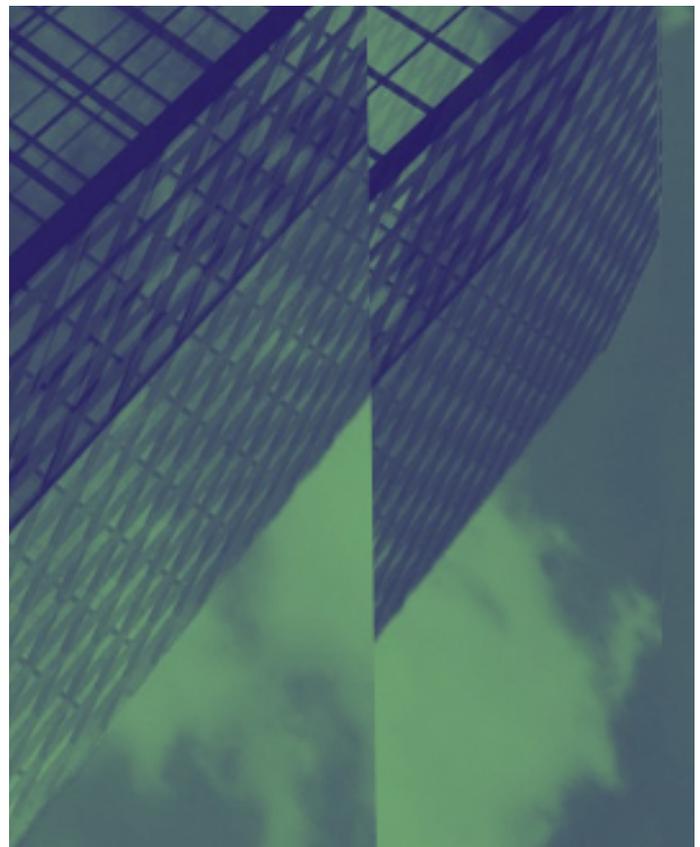
Setting a carbon price on the CO<sub>2</sub> emissions of the building sector can take numerous forms and modalities, from establishing a tax to using more market-based instruments, such as an emissions trading system (ETS) that can be an effective tool to significantly lower CO<sub>2</sub> emissions. Indeed, the EU ETS proved to be successful to systematically reduce CO<sub>2</sub> emissions in sectors covered by the system<sup>3</sup>. A carbon pricing policy (carbon tax or cap and trade mechanism) is needed to increase the economic viability of fuel switch<sup>4</sup>, which will drive the decarbonisation of heating with the most cost-effective solutions. Its extension to all types of fossil fuels is a necessary tool to implement the "polluter pays principle" while providing a price signal to consumers.

In the context of the building stock, however, some sector-specific particularities require a thorough assessment when considering the introduction of a price on carbon emissions. These include:

- The low-price elasticity<sup>5</sup> of energy demand, which shows that energy prices are inelastic in both the short and long-term, i.e. energy consumption will fall by less than 1% in response to a 1% increase in energy prices. Such low elasticity could only be overcome with a significantly higher CO<sub>2</sub> price;
- The buildings management/ownership structure and related split incentives, which blur the responsibilities and related costs for fuel switch.

This means that the decarbonisation of buildings, in addition to requiring a comprehensive approach to energy

management (conception, design, building, delivering, and operation), also necessitates both the above-mentioned sector-specific considerations to be duly taken into account when thinking of establishing a complementary CO<sub>2</sub> based pricing mechanism.



3. Between 2005 and 2018, ETS emissions decreased by 29% and Member State Effort Sharing Regulation emissions fell by 11%. Looking ahead, the European Environment Agency's projections for 2005-2030 indicate that efforts to decarbonise the Effort Sharing Sectors "would only achieve a -27 % reduction when additional policies and measures are included. These reductions remain insufficient compared with the 30 % reduction that the Effort Sharing sectors should achieve by 2030" under the old EU targets. Conversely, EU ETS emissions are projected to meet the current cap of -43% in 2030, compared to 2005. The EU ETS' success at meeting predefined targets, and the fact that it is designed to facilitate increased climate ambition, has shown the effectiveness of emissions trading as a policy instrument. From European Environment Agency: "Trends & Projections in Europe 2019; Tracking Progress towards Europe's Climate & Energy Targets" (2019).

4. International Renewable Energy Agency (2018). [Renewable Energy Policies in a Time of Transition](#).

5. Price elasticity is the percentage change in quantity demanded in response to a 1 percent change in price.

## Carbon pricing should not replace high-impact regulatory measures in the building sector

It is essential to underline that carbon pricing in the building sector can only work effectively and efficiently as part of a well-designed broader policy mix. Carbon pricing should never replace existing or emerging impactful measures to boost energy efficiency. Therefore, policies related to buildings should be kept in the Effort Sharing Regulation (ESR) sectoral scope with increased ambition. Indeed, achieving at least 55% GHG emission reduction by 2030 will require increased efforts in both the ESR and the ETS.

Even if a fuel switch is achieved, i.e. through a higher level of CO<sub>2</sub> price, a carbon price alone is expected to have a limited impact on renovations and especially on deep renovations<sup>6</sup>. Energy efficiency measures aimed at accelerating renovations rates and increasing renovation depths - combined with the uptake of renewable technologies in heating and cooling (notably heat pumps) and high efficient district heating - are effective policies to achieve higher climate ambition. This is also recognised by the European Commission's impact assessment for 2030 target which states that "there is ample evidence that the short term price sensitivity in the buildings and transport sector is relatively low, hence prices either cannot overcome all barriers or might need to be very high to achieve the outcome."

In this respect, the ongoing revision of the Energy Efficiency Directive, Renewables Directive, and the Energy Performance of Buildings Directive is key to introduce new policy signals to stimulate buildings renovations, including a higher energy efficiency target, the introduction of Minimum Energy Performance Standards, a minimum level of renewables in new and renovated buildings, and incentives for solutions able

to optimize buildings' energy use as design, maintenance and operation phase, including active energy management schemes. This is all the more important as ambitious regulatory measures can reduce carbon costs for consumers.

It is also essential to evaluate the links and verify potential overlap and uncertainties that might appear between carbon pricing, CO<sub>2</sub> taxation, and its effects, and the existing EU regulatory framework on building efficiency and renewable energy<sup>7</sup>. For instance, in the case carbon pricing would be introduced through a parallel EU ETS, it would require careful coordination between the obligation to acquire quotas for fuels distributed in the framework of a parallel EU ETS, with the obligation to reduce the energy consumption of final users under article 7 of the EED (0,8 % of annual final energy consumption)<sup>8</sup>. Potential overlaps might also occur with the revision of the Energy Taxation Directive. Indeed, some Member States have already adopted a high level of CO<sub>2</sub> taxation or national fuel emissions trading schemes for all fossils fuels. The Commission should look into possible overlaps with existing national legislation to avoid double taxation.

To serve the purposes of the Green Deal, the ultimate goal of a revised legislative package in the building and heating sector is to decarbonise the EU building stock through the most cost-effective measures, i.e. energy efficiency and fuel switch, and to achieve maximum coherence and clarity, which will provide future investors with precise targets, measures, and trajectories.

6. [Deep renovation in this sense refers only to actions on the buildings' envelope](#) (Page 109).

7. Energy Efficiency Directive, Energy Performance of Buildings Directive, Directive on the use of renewable energy sources.

8. [Energy Efficiency Directive](#).

## A prerequisite to effective carbon pricing is a resilient mechanism for reinvesting the revenues to prevent and reduce energy poverty

Carbon pricing can lead to an increase in energy poverty unless appropriate flanking measures are taken to protect vulnerable groups. The lowest-income households are likely to be financially constrained and may find it difficult to carry out renovation works, including the uptake of low-carbon technologies. Furthermore, households living in a rental property are entirely dependent on the decisions of the owner. The burden of a potential carbon pricing would be even higher for households still relying on high-carbon technologies, because the costs of fossil fuel heating, for those unable to switch to low carbon alternatives, are expected to increase by 22% in 2030. Therefore some of the effects could only be mitigated by a reduction in demand, which in the case of low-income households could lead to under-heating and therefore a substantial loss of welfare<sup>9</sup>. This is all the more likely to occur as studies have shown that only a high carbon price would be able to trigger some changes. According to the Öko-Institut and Agora Energiewende<sup>10</sup>, carbon prices of 145 to 245 €/t CO<sub>2</sub> in the building sector would be required in addition to the existing regulatory and taxation system to achieve significant emission reductions in Germany by 2030.

Renovation of buildings, an integral part of the decarbonisation effort, is particularly capital intensive. We encourage renovation efforts following a district approach<sup>11</sup> as suggested in the Energy Performance of Buildings Directive and in the Renovation Wave. This will not only complement other energy efficiency measures for decarbonisation, but it could

also help address distributional challenges that may arise from the inclusion of buildings in the scope of the EU ETS.

Carbon pricing could generate significant revenues that should be reinvested for comprehensive building renovation. These funds should be partly invested in the Renovation Wave objectives through an EU renovation fund<sup>12</sup>. Indeed, energy poverty can be greatly alleviated or prevented through deliberate policy measures<sup>13</sup>. Financial programmes to increase energy efficiency and the use of renewables in buildings will also lower carbon costs for consumers, and low-income households should hence be the priority target group of these measures and funding.

Auction revenues could be distributed among the Member States based on a solidarity mechanism similar to the one used in EU ETS in favour of lower-income Member States to prevent distributional concerns<sup>14</sup>.

9. [Decarbonising European transport and heating fuels - Is the EU ETS the right tool?](#)

10. Öko-Institut and Agora Energiewende (2020) [How to Raise Europe's Climate Ambitions for 2030: Implementing a -55% Target in EU Policy Architecture](#).

11. European Alliance to Save Energy, (2020), [Recommendations for a neighbourhood approach to maximize energy efficiency in renovation and energy planification](#).

12. [EU renovation fund](#).

13. CE Delft (2020), [Zero Carbon Building](#). CE Delft, 2020.

14. Umwelt Bundesamt, (2020), [Raising the EU 2030 GHG Emission Reduction. Target Implications for ETS and non-ETS sectoral targets](#).

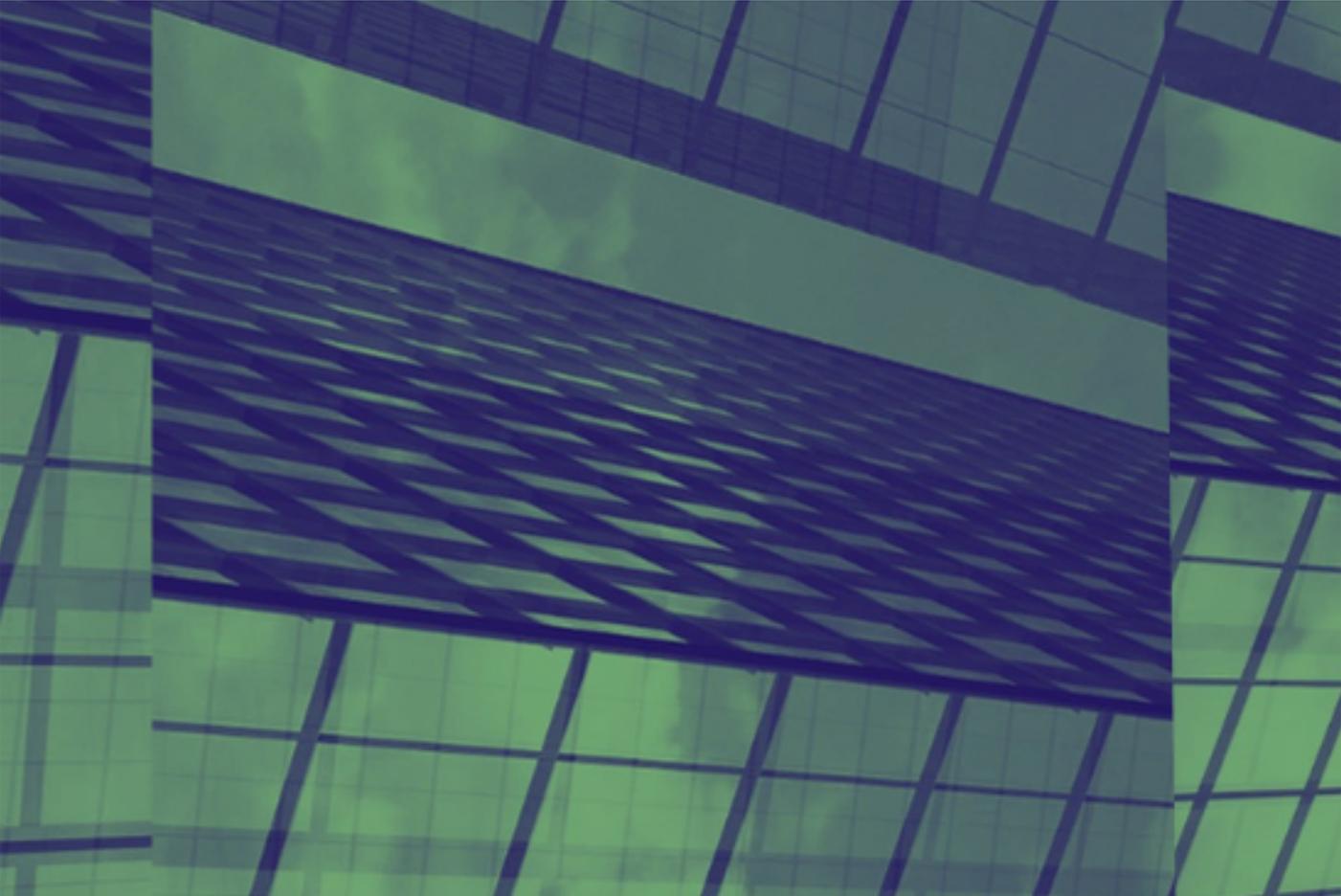
# Conclusion

Energy efficiency should be the starting point for all decarbonisation efforts. Carbon pricing can be part of this effort, as it can provide incentives for the fuel switch and to some extent for energy efficiency investments. Yet, we believe it should not replace impactful regulatory measures in the building sector driving energy savings necessary to meet climate neutrality. This relates to the fact that the building sector has some specificities compared to other sectors currently covered by carbon pricing such as the low price elasticity of energy demand and the specific ownership structure of buildings.

Carbon pricing in the building sector can only work effectively and efficiently as part

of a well-designed broader policy mix and it should never be considered as a replacement for existing or emerging impactful measures to boost energy efficiency. Policies related to the building sector should be kept in the ESR sectoral scope with increased ambition. Achieving at least 55% GHG emission reduction by 2030 will require increased efforts in both the ESR and the ETS.

If implemented, a complementary carbon pricing policy could generate significant revenues, which should be reinvested in comprehensive building renovation, e.g. with the establishment of an EU renovation fund, and direct support for the most vulnerable consumers.





The **European Alliance to Save Energy** (EU-ASE) aims to advance the energy efficiency agenda in Europe. It allows world's leading multinational companies to join environmental campaigners and a cross-party group of Members of the European Parliament.

EU-ASE business members have operations across the 27 Member States of the European Union, employ over 340.000 people in Europe and have an aggregated annual turnover of €115 billion.

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