Renovation wave(s): Three steps to manage the climate crisis and deliver a just transition for all

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Introduction

Buildings are responsible for almost half of the EU’s final energy consumption and account for 36% of CO₂ emissions. Two-thirds of existing buildings are likely to remain in use by 2050 meaning the EU cannot become zero-carbon unless it prioritises targeted and robust action to tackle this problem.

A large part of the problem stems from the failure to implement existing legislation on Energy Efficiency, the Energy Performance of Buildings and Renewable Energy Directives. These laws govern the construction of near-zero energy and decarbonised buildings (NZEBS) and the renovation of the building stock regardless of its size, age and climate zones. Effective management, more than additional legislation, is key.

The European Commission announced a ‘Renovation Wave’ to work alongside Member States in delivering energy efficiency improvements in public and private buildings. This is a start. But it is still a long way from what is required.

We propose three simple steps to institutionalise ownership, management and delivery of the systematic removal of fossil fuels in all types of buildings so that the sector is compatible with the Paris Agreement long before 2050. The aim is full deployment of renewable energy sources coupled with energy savings to replace all fossil fuel utilisation.

The first step is to establish a management committee or Renovation Waves Forum which meets annually to mark progress in each Member State of targeted buildings. This high-level setting should provide the needed political impetus to deliver the necessary changes.

A Communications Wave is needed to build broader awareness and a pipeline of investments, especially in an area where there are split incentives for private landlords and occupants. This helps to maintain momentum and keep the issue on everyone’s radar until it is solved.

Finally, the building sector challenge should be desegregated into a series of manageable tasks. A series of Renovation Waves, each designed to tackle a unique sector of buildings from private to public, social housing and large-scale heat networks. Central to these Renovation Waves is the need to go beyond insulation and the building envelope towards replacing fossil heating systems with renewable energy systems, high-efficiency heat pumps and district heating systems which make a positive and lasting improvement to people’s lives and the overall health of communities.
Our aim is to displace fossil fuels in buildings to address the climate crisis. It just so happens that geothermal heat pumps, the most efficient and reliable heat pumps available, combined with geothermal heat grids, are an affordable renewable energy in constant supply. It also helps to reduce consumer energy bills, alleviate the burden of energy imports, reduce geopolitical risk whilst solving the climate crisis. Alongside other renewable energy sources and robust energy savings measures, geothermal energy proves that the building decarbonisation problem is solvable, good for inclusive growth and a just transition in which everyone experiences a direct benefit.

European Parliament (Brussels) will switch to geothermal energy in 2020
1. Establishing the Renovation Waves Forum

The European Commission’s desire to create an ‘expert panel’ to accelerate investment in buildings, as outlined in its European Green Deal Communication, could bring some benefits to the debate. Many similar initiatives already exist. Neither can deliver the large-scale investments required. A different approach is required.

Approaching the challenge from a project management perspective will ensure successful achievement of outcomes. Therefore, we call for an annual Renovation Wave Forum to be established. This should allow Member States and local authorities to update the EU on progress on investments in renewable energy heating, cooling and electricity systems at the expense of fossil fuel systems. This provides annual progress reports on the implementation of the Renewable Energy Directive (Article 23 and 15) and Article 7 of the Energy Efficiency Directive, which outline requirements for investment in renewable heating and cooling systems in existing and new buildings.

An additional purpose of this Renovation Wave Forum is to identify common bottlenecks and ensure they are addressed, where possible, at an EU level to ensure widespread and rapid deployment of energy renovations. Ensuring the renovation community and financiers have a seat at this table keeps the emphasis on problem solving and implementation.
2. EU Communication campaign to raise awareness

The Swiss government introduced a communications programme to accelerate investment in renewable heating and cooling systems in households. The “Chauffez renouvelable” campaign launched by Suisse Energie, is a program operated by the Federal Service for Energy.

A public awareness campaign was launched to promote an online tool which helps consumers to calculate the economic and climate benefits of renewable heating compared to fossil heating systems. This clearly shows that renewable heating solutions are the most cost effective and best for the climate. Interested households can contact an independent consultant to perform an audit of the resident’s energy system. These consultants are trained by the Federal Service for Energy to ensure the advice is independent and accurate. Investments in renewable heating systems are fully funded by the country’s levy on CO₂ emissions.

We recommend the EU:

1. Introduce a similar campaign to raise awareness of renewable heating and cooling systems;
2. Operate independent energy auditing training and registration systems for building auditors;
3. Develop an online tool to indicate buildings or communities that have switched away from fossil energy to renewable energy systems.
3. Renovation Waves

Targeted investment in geothermal energy and other renewable energy solutions is central to each of the Renovation Waves. Geothermal energy provides constant supplies of renewable, CO$_2$-free heating and cooling to all types of buildings. It is also one of the cheapest renewable energy supplies. The Renovation Waves should be:

1st Renovation Wave: Combatting fuel poverty

Between 50 and 125 million people are unable to heat their houses in Europe.$^iv$ Restoring dignity to those living in fuel poverty is vital in the transition to zero-carbon living. This is a unique problem requiring bespoke action.

Social housing must be a priority area for action as it is also one of the main drivers for large-scale renovation. In France, for example, for every private sector renovation there are seven renovations in social housing. In France, for example, for every private sector renovation there are seven renovations in social housing. Between 2001-2017 Housing Associations replaced three-quarters of oil-based heating systems with district heating or other more sustainable energy sources.

Targeted support for social housing providers will ensure that the needs of those most affected by the climate crisis are addressed upfront. It will also build resilient communities, restore pride to impoverished areas, dignity for the fuel poor and provide decent and affordable homes in places where people can reach their full potential.

Social housing providers are easy to identify and cover significant portions of housing across the EU, as outlined in Figure 1. Therefore, they can fully decarbonise faster than other parts of the building sector.

We recommend:

1. An EU fund or targeted national use of Emission Trading System auction revenues are channelled into decarbonising buildings operated by social housing providers;

2. Aggregating the risks associated with initial capital investments in the EU. This could be achieved by either national infrastructure banks underwriting the risk of investments, initial capex costs or offering guarantees for project delivery.

3. The EIB should establish a Social Housing Funding line which aggregates all social housing organisations into a single legal entity to enable financial flows into these investments.
The Share of Social Housing

Country | Percentage
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Austria | 24%
Belgium | 7%
Czech Rep | 8%
Denmark | 21%
Estonia | 2%
Finland | 13%
France | 16.5%
Germany | 3%
Ireland | 9%
Italy | 4%
Netherlands | 30%
Poland | 8%
Portugal | 2%
Slovenia | 6%
Spain | 3%
Sweden | 19%
UK | 18%

Source: Social Housing Europe
2nd Renovation Wave: District heating systems

Many cities operate district heating systems. Shifting these to renewables will make an instant impact in terms of reducing climate pollution and costly energy imports. For example, the cities of Rotterdam, Strasbourg, Munich, Budapest, Zagreb and Lodz are looking to shift thousands of households from fossil heat to renewable heating systems.

A specific Renovation Wave looking to upgrade existing heat networks to renewable heating and cooling as well as developing new renewable district heating and cooling networks would bring the largest volume of improvements in the shortest timescale.

The main challenge here is that fossil heating does not face a carbon-price on its externalities. Those Member States which have introduced carbon pricing for fossil heat have seen the largest investments in district heating systems. Furthermore, in some CEE countries, district heating networks are linked to fossil power generation capacity. For example, Poland obtains 90% of its electricity from coal. This coal capacity also provides over 50% of the country’s heat demand in households and 75% of the energy used in district heating systems.

Therefore, decarbonising heat grids with renewable heat accelerates the economics of coal phaseouts. For example, the French Environment & Energy Management Agency (ADEME) found geothermal and other renewable heating solutions are much more cost-effective than fossil fuels. Geothermal district heating systems cost 1.5 eurocent/kWh whilst fossil gas systems cost 5.1 eurocent/kWh.
Upgrading existing heat networks and building new ones makes achievement of individual Member State Effort Sharing Regulation targets much more cost-effective and easier to achieve. Moreover, this is the socio-economic glue that makes the transition to sustainability of tangible benefit to every citizen everywhere.

We recommend:

1. Recognition of district heat grids as Projects of Common Interest in the Connecting Europe Facility;

2. An upstream carbon price is applied to fossil heat energy sources. The revenues from these carbon prices are redirected towards renewable district heat grid investment as well as other Renovation Waves priorities.

3rd Renovation Wave: Public buildings

Public buildings must have a dedicated programme. Some have or are ready moving towards renewable heating and cooling solutions. For example, the European Parliament will use geothermal energy by the end of 2020 whilst the House of European History already does. The Bundestag in Germany, NATO headquarters in Brussels, and others opt for geothermal or other renewable energy solutions when renovated.
Hospitals require a constant supply of heating and cooling for patient care and storing medical products. This energy demand is a significant source of CO\textsubscript{2} emissions. Globally, 365 Mt CO\textsubscript{2} comes from cooling demand in hospitals. Europe is the third largest emitter of hospital cooling emissions, which is equivalent to 75 million cars on the road or 110 coal power plants.\textsuperscript{vii} Heating in hospitals is also an issue. The Venizelio hospital in Crete, for instance, produces 733 tons of CO\textsubscript{2} per year due to the use of an oil boiler.\textsuperscript{viii}

Schools, universities and libraries use electricity, heat and cooling for lighting, warmth, cooling and meals. Sweden is particularly known for its big universities and campuses which have switched to geothermal energy during recent renovation processes (Chalmers University, Campus Karlstad, Lund University, the Royal Institute of Technology from Stockholm). The Balatonboglár, National Handball Academy, the University of Pécs and the Törökbálint, School and Sport Centre in Hungary have also switched to geothermal energy.

We recommend:

1. A list of all public buildings, schools, universities and hospitals is made so that appropriate renewable heating, cooling and electricity solutions are installed therein within a 5 to 10-year timescale.

2. The Connecting Europe Facility recognises public buildings – schools, hospitals, libraries, universities, museums, government offices and other such establishments – are critical European infrastructure so that investments in their energy system renovations are classified as Projects of Common Interest.
**4th Renovation Wave: Individual households**

Individual households are too numerous. There are over one hundred million of them. Yet their refurbishment should deliver considerable employment opportunities as well as significant reductions in the energy import costs. A Swiss-style communications campaign should provide adequate awareness of the need to switch from fossil to renewable heating solutions. If this does not deliver significant volumes of refurbishments additional EU regulations may be needed like those proposed in Austria.

The Austrian government will introduce legislation to make it zero-carbon by 2040. From this basis it has identified buildings and heat as priority areas for action. Much of the major cities are linked to district heat grids whilst rural areas are located into fossil gas. Austria will use a series of regulatory measures to renovate buildings away from fossil energy. From 2050 no new gas boilers will be permitted in new buildings. From 2021 onwards, any heating system refurbishment will require a mandatory removal of coal and oil boilers. By 2035 all existing coal and oil boilers will have to be replaced.

We recommend:

1. An EU-wide communications campaign, modelled on the Swiss example, to target privately-owned households. If this does not deliver substantial to remove bottlenecks in investment.

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3. See [https://www.suisseenergie.ch/page/fr-ch/chauffezrenouvelable](https://www.suisseenergie.ch/page/fr-ch/chauffezrenouvelable) Note this is in French, German and Italian languages.


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