A RENOVATION WAVE FOR EUROPE – Greening Our Buildings, Creating Jobs, Improving Lives
Copper makes buildings a climate solution

Benefits & Enablers Of Deep Energy Renovation

Buildings account for approximately 40% of energy consumption and 36% of CO₂ emissions in the EU. More than 220 million building units, representing 85% of the EU building stock, were built before 2001. 85-95% of today’s buildings will still be standing in 2050.

KEY TARGETS OF THE RENOVATION WAVE

• By 2030 the EU should reduce buildings’ greenhouse gas emissions by 60%, their final energy consumption by 14% and energy consumption for heating and cooling by 18%.
• The RW addresses the low rate of energy renovation, around 1% across the EU, with the aim to at least double this for both residential and non-residential buildings by 2030, fostering deep energy renovation.
• Mobilising forces at all levels towards these goals will result in the renovation of 35 million units by 2030.

The renovation wave is an essential part of the energy transition without which a climate-neutral EU will not be feasible. It requires mobilisation of tremendous resources but considering that buildings are at the crossroads of the electricity, heating and transport sectors we can see it as an excellent opportunity to solve multiple climate issues and turn buildings from a problem into a solution for the climate.

Here, we present a strategy for meeting the renovation wave targets, highlight the environmental, economic and societal benefits associated with deep energy renovation and introduce the role of copper-based technologies in dedicated sections.
Benefits & Enablers Of Deep Energy Renovation

Copper drives deep energy renovation of buildings

Copper is a key element for decarbonisation of the building stock due to its inherent properties, particularly its excellent electrical and thermal conductivity, making it the material of choice for lowcarbon, efficient and smart building technologies.

Copper is needed for many applications in buildings and their renovation:
• Copper improves efficiency of heat exchangers in heat pumps, solar thermal and waste heat recovery systems.
• Copper is a key material for safe electrical installations (wires and cables), renewable energy generation (photovoltaics) and storage (batteries).
• Copper is key for fire resistance and with an increased cross-sectional area improves efficiency.
• Copper is used in sensors, actuators and cables in building automation systems as well as photovoltaic systems.

Copper products have long service lives and can be recycled infinitely at end of life, making copper a sustainable material.
• Copper industry has an established responsible production programme, the Copper Mark.
• Copper products are already highly recycled and the scrap value chain is well-established. Ambitious recovery targets are needed to increase recycling at end of life.
• Copper has long-term availability.

One tonne of copper can help decarbonise on average 11 detached, 120m² family houses through deep energy renovation.

Environmental benefits
• Reduced carbon emissions
• Increased renewable energy generation

Societal benefits
• Improved health and wellbeing
• Increased safety

Economic benefits
• Savings on energy bills
• Increased property values

Enablers of renovation
• Energy efficiency
• Zero-emission transport
• Smart home technology
SUSTAINABLE AND CIRCULAR BUILDINGS
Use of sustainable, circular materials, like metals such as copper which is highly recyclable without loss of properties and has well-established recovery chains should be prioritised. Applying circularity principles to building renovation, sourcing safe, sustainable and secondary raw materials, reuse and recycling and waste management will reduce materials-related greenhouse gas emissions for buildings.

NATURE PRESERVATION
Deep renovation can reduce pressure for greenfield construction, helping preserve nature, biodiversity and fertile agricultural land.

CLEANER AIR
Cutting emissions from heating improves the air we breathe, benefits our health and the environment. In Europe ~ 50% of primary fine particulate matter emissions are related to heating and over 400,000 premature deaths every year are linked to air pollution. A switch to low carbon fuels and renewable based, efficient heating is needed.

ENVIRONMENTAL BENEFITS
REDUCED HEAT DEMAND
Whichever low-carbon heat technology is adopted, energy efficiency remains critical. It reduces heat demand and thereby the investment required to decarbonise heat, is an enabler of buildings that are electrified and thereby the investment required to decarbonise heat, is an enabler of buildings that are electrified to act as a flexible resource, and it is an enabler of lower and zero-carbon heating systems operating at higher performance.

DECARBOONISED BUILDING STOCK
To decarbonise the building stock, renovation programmes should combine energy efficiency improvements with policies that boost on-site renewable generation, promote demand-side flexibility and sector integration, and prioritise smart electrification of heating and cooling. Energy renovation of 35 million units will result in a reduction of 60% in buildings' greenhouse gas emissions.

REDUCED EMISSIONS FROM TRANSPORT
Sectoral integration between buildings and transport should be enhanced through the deployment of future-proof smart charging infrastructure in residential and commercial real estate. Any renovation should include charging infrastructure which is able to interact with the smart grid.

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ECONOMIC BENEFITS

LOWER ENERGY BILLS
High levels of building renovation, targeting a renovation rate of 3% per year, combined with the direct electrification of heat supply could unlock up to €23 billion in savings on consumer energy bills.

SMART HOMES
Fostering the uptake of the latest technologies through deep and integrated renovation will provide smart buildings with integrated renewables and enable measurement of actual energy consumption, driving cost-optimisation. The new Smart Readiness Indicator promotes digitally friendly renovations.

HIGHER ENERGY SECURITY
Energy renovation of 35 million homes by 2030 and reduction of their final energy consumption by 14% and energy consumption for heating and cooling by 18% will enhance energy security by avoided energy generation and fossil fuel imports.

SYSTEM INTEGRATION
Smart buildings should be fully integrated and act as active energy infrastructure elements in the power system. New electric loads such as heat pumps, building load management systems, smart charging infrastructure for electric vehicles and storage solutions in buildings will be essential drivers for this demand-side flexibility, making it possible to smartly and cost-effectively integrate a large share of variable renewables into a decarbonised energy system.

ENABLERS OF RENOVATION

REINFORCED, ACCESSIBLE AND MORE TARGETED FUNDING
Building renovation is one of the sectors facing the largest investment gap in the EU. The Commission estimates that to achieve the proposed 55% climate target by 2030, around €275 billion of additional investments are needed per year. Intensity of EU or Member State support should be proportional to energy performance of renovated buildings.

DIGITALISATION AS A CATALYST
Smart buildings can provide essential privacy-compliant data for city planning and services. Harmonised, technology neutral digital information at product and building level should be available for regulatory, consumer and professional needs incorporating technical, sustainability, resource efficiency, circularity, real time energy performance information via the Smart CE mark, BIM, Building Logbooks, Product and Material Passports, Building Renovation Passports, Energy Performance Certificates, the Smart Readiness Indicator and any future application.

PLANNING, STAGED APPROACH
Building Renovation Passports outline the long-term staged deep renovation plan for an individual building over a period of 15 to 20 years. BRPs are useful tools to support owners with personalised renovation advice and ensure coordination of works during the different stages of the renovation for all involved parties.

INDUSTRIALISATION
Scaling up renovation needs the introduction of a system (district) perspective to promote integrating solutions, moving away from single-building focused renovation.

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