A RENOVATION WAVE FOR EUROPE – Greening Our Buildings, Creating Jobs, Improving Lives

Copper makes buildings a climate solution

European Copper Institute
Copper Alliance

Benefits & Enablers Of Deep Energy Renovation

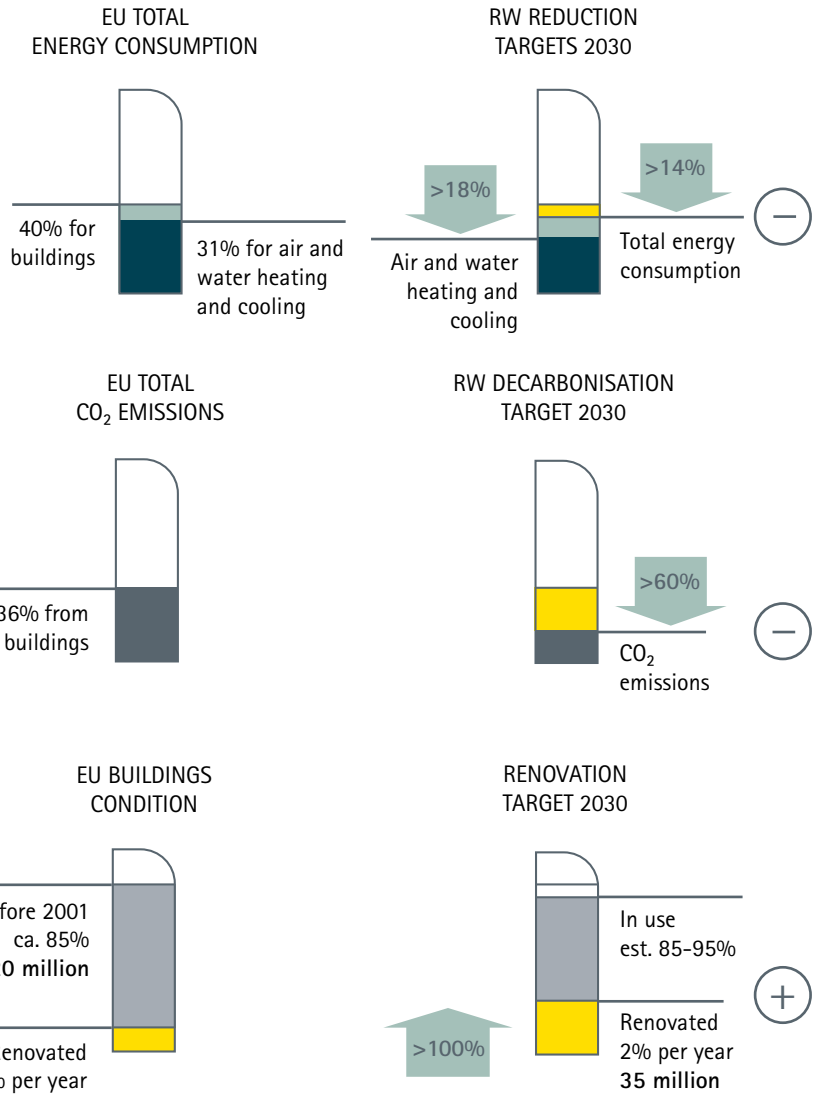
Buildings account for approximately 40% of energy consumption and 36% of CO_2 emissions in the EU. More than 220 million building units, representing 85% of the EU building stock, were built before 2001. 85–95% of today's buildings will still be standing in 2050.

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 low carbon, efficient and smart building technologies.

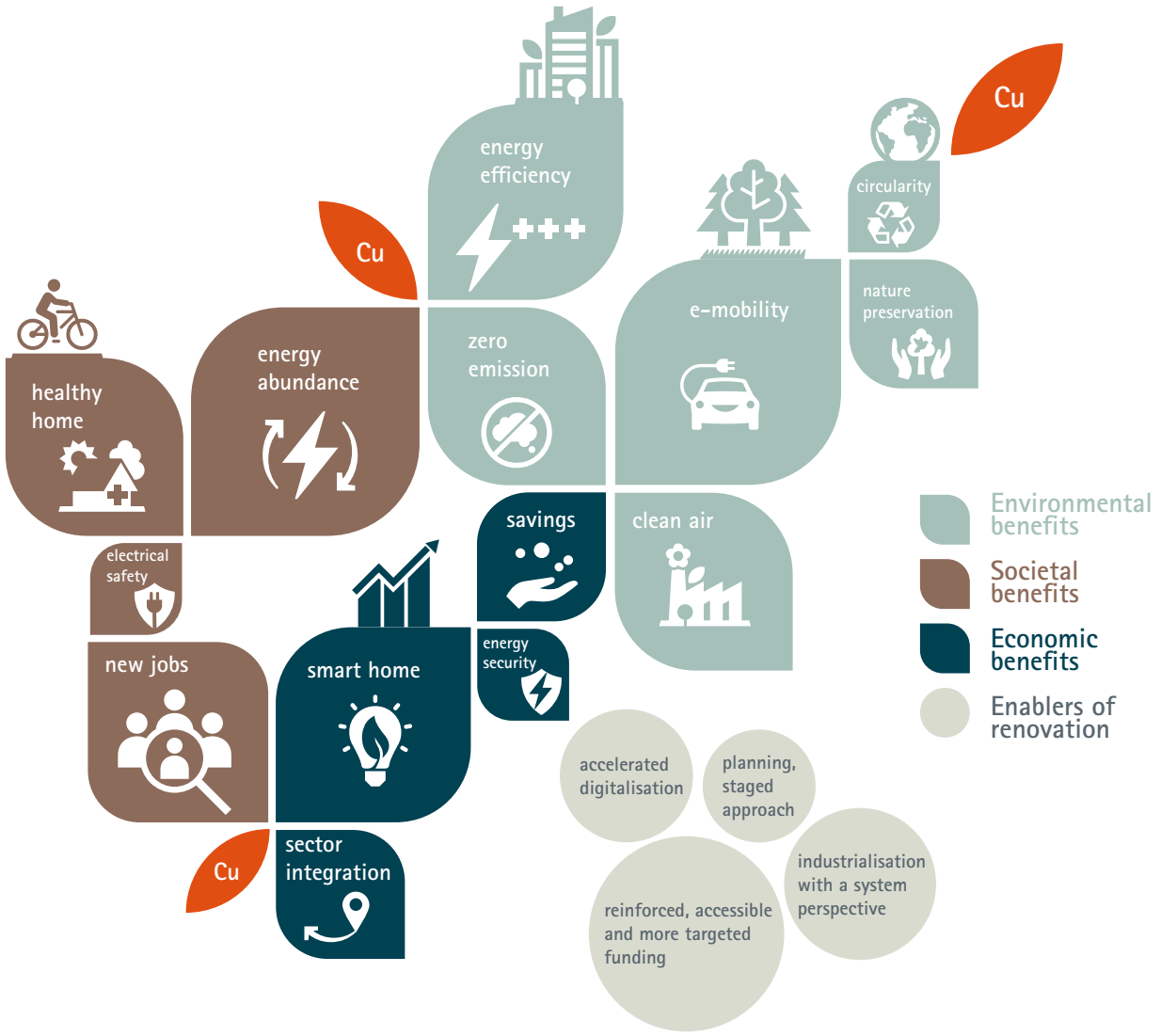
One tonne of copper can help decarbonise on average 11 detached, 120m^2 family houses through deep energy renovation.

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 wiring is fire resistant and with an increased cross section can improve efficiency.
- Copper is used in sensors, actuators and cables in building automation systems as well as photovoltaic system.

Copper products have long service lives and can be recycled infinitely at end of life, making copper a sustainable material.

- Copper industry has an estabished 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.



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Copper makes buildings a climate solution

Copper amplifies the benefits of deep renovation

HOLISTIC APPROACH TO RENOVATION

To foster deep energy renovation an encompassing and integrated strategy must be adopted following these key principles:

- Energy efficiency first
- Decarbonisation of heating and cooling via electrification
- Integration of renewables
- Sector integration and demand side flexibility
- Life-cycle thinking and circularity
- Increased safety standards, e.g. electrical
- High health and environmental standards
- Affordability and alleviation of energy poverty

Renovation is not only about reducing energy bills and cutting down emissions. It can open up numerous possibilities and generate far-reaching social, environmental and economic benefits. Through renovation, buildings can be made healthier, safer, greener, smart, sustainable and circular, interconnected within a neighbourhood district, more accessible, resilient to extreme natural events, and support the roll out of e-mobility, among others.

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, it is an enabler of buildings that are electrified to act as a flexible resource, and it is an enabler of low and zero-carbon heating systems operating at higher performance.

DECARBONISED 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 & 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.

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.

Benefits & Enablers Of Deep Energy Renovation

SOCIETAL BENEFITS

ALLEVIATED ENERGY POVERTY
Doubling the renovation rate, if coupled with an energy poverty alleviation target, can remove 5 to 8 million of the current 23 million households suffering from energy poverty by 2030.

SAFE ELECTRICAL SYSTEMS
Fire discriminates. Energy poverty is a significant catalyst for electrical safety issues. Safe electrical installations are a prerequisite for a clean and just energy transition since the electrification of buildings has an important role to play in the decarbonisation of our building stock.

HEALTHIER HOMES
Europeans spend 90% of their time indoors so poor internal environments have a huge impact on health and productivity. The main health risks related to cold, damp and poorly ventilated buildings are more than halved in renovated buildings. By doubling the renovation rate, reductions in mortality and healthcare costs will result in monetised health benefits of € 952.9 million for the period 2020 to 2030.

NEW, GREEN, LOCAL JOBS & EDUCATION
By 2030 an additional 160,000 green jobs could be created in the EU construction sector through a renovation wave delivering predominantly local jobs for SMEs hard hit by the economic impact of the COVID-19 crisis. Up-skilling and reskilling of the workforce for green works in the construction field is paramount.

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.