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 amount for approximately 40% of energy consumption and 30% of CO₂ emissions in the EU. More than 220 million building units, representing 85% of the EU building stock, were built before 2001, with 85-95% of today’s buildings will still be standing in 2050.

**KEY TARGETS OF THE RENOVATION WAVE**

- By 2030, the EU will aim to at least double this for both residential and non-residential buildings by 2030, focusing on deep energy renovation.
- District heating and cooling systems can improve efficiency.
- Joining 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 while 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 use this 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, highlighting the environmental, economic, and societal benefits associated with deep energy renovation and introduce the role of copper-based technologies in dedicated sections.

Copper is a key element for decarbonisation of the building stock due to its inherent properties, particularly in excellent electrical and thermal conductivity, making it the material of choice for low-carbon, 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.
- Copper is needed for many applications in buildings and their renovation.
- 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.

**Benefits & Enablers Of Deep Energy Renovation**

- Copper drives deep energy renovation of buildings
- Copper is key element for decarbonisation of the building stock due to its inherent properties, particularly in excellent electrical and thermal conductivity, making it the material of choice for low-carbon, efficient and smart building technologies.
- Copper has long-term availability.
- Copper improves efficiency of heat exchangers in heat pumps.
- Copper is needed for many applications in buildings and their renovation.
- 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.
Copper drives deep energy renovation of buildings

Benefits & Enablers of Deep Energy Renovation

Copper is a key element for decarbonization 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.

Copper is needed for many applications in buildings and their renovation:

- Copper improves efficiency of heat exchangers in heat pumps and air-to-water heat pumps
- Copper is needed for many applications in buildings and their renovation
- Copper is a key element for decarbonization 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.

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

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

Copper is a key element for decarbonization 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.

Copper is needed for many applications in buildings and their renovation:

- Copper improves efficiency of heat exchangers in heat pumps and air-to-water heat pumps
- Copper is needed for many applications in buildings and their renovation
- Copper is a key element for decarbonization 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.

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

One tonne of copper can help decarbonise on average 11 detached, 120m² family houses through deep energy renovation.
A RENOVATION WAVE FOR EUROPE – Greening Our Buildings, Creating Jobs, Improving Lives

Copper makes buildings a climate solution

**Benefits & Enablers Of Deep Energy Renovation**

**SOCIETAL BENEFITS**

- *Healthier homes* - Doubling the renovation rate, if coupled with an energy poverty alleviation target, it is estimated that 8 million of the current 23 million households suffering from energy poverty by 2030.
- *Cleaner air* - Cutting emissions from heating improves the air we breathe. New electric heating systems with integrated renewables and enable measurement of actual energy performance, driving cost-optimisation.
- *Reduced heat demand* - Energy renovation of 35 million homes by 2030 and reduction of natural gas consumption of 3% per year, combined with the direct electrification of heat and cooling will enhance energy security by 18% will enhance energy security by 18%.
- *Higher energy security* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Reinforced, accessible and more targeted funding* - Readiness Indicator promotes digitally friendly renovations.
- *New green local jobs in Europe* - By 2023 at least 1 million green jobs could be created in the EU construction sector through a renovation wave delivering predominantly local jobs for SMEs by boosting the employment impact of the COVID-19 crisis.
- *Safety electrical systems* - Smart buildings can provide essential privacy-compliant data for regulatory, consumer and professional needs incorporating technical, sustainability, resource efficiency, circularity, real time monitoring.
- *Maximising energy performance information via the Smart CE mark, BIM, revelations and industrialisation* - Smart buildings can provide essential privacy-compliant data for regulatory, consumer and professional needs incorporating technical, sustainability, resource efficiency, circularity, real time monitoring.

**ENABLERS OF RENOVATION**

**ECONOMIC BENEFITS**

- *Lower energy bills* - High levels of building renovation, targeting a renovation rate of 7% of the EU stock between 2020 and 2030 will result in a reduction of primary energy consumption of 3% per year.
- *Smart homes* - Energy performance information via the Smart CE mark, BIM, revelations and industrialisation.
- *Economically viable* - Doubling the renovation rate, if coupled with an energy poverty alleviation target, it is estimated that 8 million of the current 23 million households suffering from energy poverty by 2030.
- *SMART HOMES* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Reinforced, accessible and more targeted funding* - Readiness Indicator promotes digitally friendly renovations.
- *New green local jobs in Europe* - By 2023 at least 1 million green jobs could be created in the EU construction sector through a renovation wave delivering predominantly local jobs for SMEs by boosting the employment impact of the COVID-19 crisis.
- *Safety electrical systems* - Smart buildings can provide essential privacy-compliant data for regulatory, consumer and professional needs incorporating technical, sustainability, resource efficiency, circularity, real time monitoring.
- *Maximising energy performance information via the Smart CE mark, BIM, revelations and industrialisation* - Smart buildings can provide essential privacy-compliant data for regulatory, consumer and professional needs incorporating technical, sustainability, resource efficiency, circularity, real time monitoring.

**ENABLERS OF RENOVATION**

**REDUCED HEAT DEMAND**

- *Energy efficiency first* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Life-cycle thinking and circularity* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Sector integration and demand side flexibility* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Integration of renewables* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Decarbonisation of heating and cooling via electrification* - Energy renovation is one of the sectors facing the largest potential for increased investment.

**SUSTAINABLE AND CIRCULAR BUILDINGS**

- *Buildings are insulated to retain heat and keep indoor temperatures consistent* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Low embodied carbon* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *High quality* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Smart buildings can provide essential privacy-compliant data for regulatory, consumer and professional needs incorporating technical, sustainability, resource efficiency, circularity, real time monitoring.

**REDUCED EMISSIONS FROM TRANSPORT**

- *Digital孪生* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *NATURE PRESERVATION* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *SAFE ELECTRICAL SYSTEMS* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *REHABILITATION, LIFE-CYCLE BENEFITS* - Energy renovation is one of the sectors facing the largest potential for increased investment.

**BENEFITS OF DEEP ENERGY RENOVATION**

- *Environmental benefits* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *System integration* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *New electric heating systems with integrated renewables* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Quality assurance* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Enhanced energy performance* - Energy renovation is one of the sectors facing the largest potential for increased investment.

**REDUCED EMISSIONS FROM TRANSPORT**

- *Digital孪生* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *NATURE PRESERVATION* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *SAFE ELECTRICAL SYSTEMS* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *REHABILITATION, LIFE-CYCLE BENEFITS* - Energy renovation is one of the sectors facing the largest potential for increased investment.

**BENEFITS OF DEEP ENERGY RENOVATION**

- *Environmental benefits* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *System integration* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *New electric heating systems with integrated renewables* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Quality assurance* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Enhanced energy performance* - Energy renovation is one of the sectors facing the largest potential for increased investment.

**REDUCED EMISSIONS FROM TRANSPORT**

- *Digital孪生* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *NATURE PRESERVATION* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *SAFE ELECTRICAL SYSTEMS* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *REHABILITATION, LIFE-CYCLE BENEFITS* - Energy renovation is one of the sectors facing the largest potential for increased investment.

**BENEFITS OF DEEP ENERGY RENOVATION**

- *Environmental benefits* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *System integration* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *New electric heating systems with integrated renewables* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Quality assurance* - Energy renovation is one of the sectors facing the largest potential for increased investment.
- *Enhanced energy performance* - Energy renovation is one of the sectors facing the largest potential for increased investment.
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.

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.

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.

www.copperalliance.eu