THINK DEEP: BOOSTING RENOVATION THROUGH INNOVATION & INDUSTRIALISATION

A KEY TO ACHIEVING HEALTHY, COMFORTABLE AND SUSTAINABLE BUILDINGS FOR ALL

CHALLENGE

A FAST CHANGING ENVIRONMENT IS AS MUCH AN OPPORTUNITY AS IT IS A CHALLENGE FOR THE EUROPEAN CONSTRUCTION INDUSTRY.

The European construction industry is confronted by an economy that is undergoing a rapid and fundamental change, shaped by megatrends such as greater urbanisation, disruptive new technologies and digitalization and globalised value chains. At the same time, the European economy faces the profound challenge of meeting the climate mitigation goal set out in the Paris Agreement of keeping average global warming to well below 2°C.

A successful achievement of the Paris Agreement goals implies low- or no-emissions from the European building stock by 2050, and materials to be used efficiently and with a minimal carbon footprint. This infers:

- significantly increasing both depth and rate of energy renovations towards a nearly zero energy level and beyond,
- that all buildings are smartly integrated in a low-carbon energy system,
- a more circular economy approach is needed - buildings constructed in a more modular way with low-carbon materials,
- that sectors such as cement, steel and chemicals deeply decarbonise,
- a more efficiently distributed and flexible energy system, where buildings serve as connection hubs for electrified vehicles and help to balance decentralised renewable energy sources.

Today, the construction industry is lagging behind other sectors in terms of innovation. Increasing the scale and pace of its transformation would create significant opportunities for Europe - whether in terms of economic growth, employment creation, or emission reductions. In particular, innovations in the construction value chain can boost extensive building improvement work that substantially increases energy efficiency and reduces energy consumption by 75% or more. The renovation of Europe's old building stock has a vital role to play in ensuring economic success and can help achieve environmental, social and other public policy goals. It is also key to enabling healthy, comfortable and sustainable buildings for all European citizens.

 # Reaching the Paris climate commitments will demand a fundamental upgrade of the European building stock.

i24c (INDUSTRIAL INNOVATION FOR COMPETITIVENESS) Rue de la Science 23, 1000 Bruxelles, Belgium Email: info@i2-4c.eu. Tel: +32 (0) 2 89 49 308
BPIE (THE BUILDINGS PERFORMANCE INSTITUTE EUROPE) bpie.eu, Rue de la Science 23, 1000 Bruxelles, Belgium Email: info@bpie.eu ,Tel: +32 (0) 2 789 30 00

OPPORTUNITY

FRONTRUNNER PROJECTS IN EUROPE HAVE DEMONSTRATED THAT INNOVATION IN ALL ASPECTS OF THE PROCESS – PRODUCTS, SERVICES, BUSINESS MODELS AND POLICY – OFFERS GREAT OPPORTUNITIES.

The Dutch Energiesprong project, for example, reduced the cost of a net zero energy renovation of a terraced house from €130,000 for the first pilot project in 2010 to €65,000, thanks to economy of scale, 3D-technologies and pre-fabricated materials. On-site work takes only a week, limiting the burden for inhabitants, while increasing their comfort and improving the look of the house. This state-of-the-art renovation programme is embedded in a holistic approach that involves all relevant actors and takes into account regulations, sales channels, energy performance guarantees, marketing, increases in property value, and finance. This approach enables deep energy renovation to be scaled up through an industrialised production process.

While the Energiesprong project is considered best practice, other European examples highlight key components that accelerate the rate of deep energy renovations, such as the KfW Energy-Efficient Refurbishment programme (Germany), Energies Posit'if (France) and Project Zero (Denmark). Some of these programmes achieve a certain level of industrialisation by aggregating and streamlining replicable processes, instruments or products. They owe their success to moving from a product-centred approach to an industrialised, service-oriented approach that uses innovative technologies, business models and/or finance models (such as selling products and services within an integrated framework), ultimately reducing the cost of energy renovations.

Yet this industrialisation process that brings down the costs of the refurbishment is enabled by proper segmentation of the building stock. Much of the success of these programmes is due to the identification of segments of residential, public and commercial buildings – mostly within a country specific approach - where there are big enough markets for industrialised approaches that will bring us in a similar success story as the solar PV technologies.

Certain typologies or groups of buildings are easier to renovate in an industrialising manner, such as office buildings, multi-storey buildings and terraced houses, where the approach is easily replicable.

The Energiesprong project and other early examples show that seven main components – Legislation, Business Model, Value Chain Ecosystem, Awareness Raising, Financing Models, Technical Solutions and Products, Aggregation of Demand - are critical to scaling up and increasing the rate and depth of energy renovation. Only by interconnecting these components and key actors it will be possible to create a viable path forward.

 # Ramping up deep energy renovation can boost the economy (competitiveness and jobs), improve living conditions (better and smarter homes) and mitigate climate change.

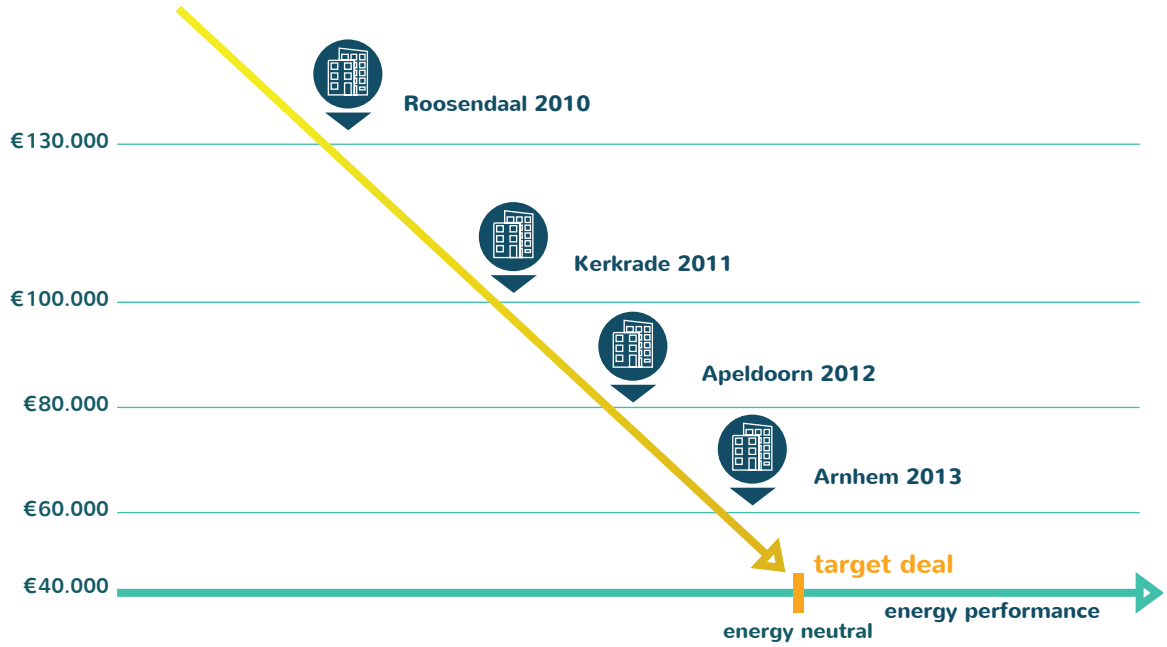

Figure 1- Renovation costs against energy use as new generation of prototypes are installed.

PROJECT ZERO – ILLUSTRATING THE VALUE OF A HOLISTIC APPROACH

THE SMALL DANISH TOWN OF SØNDERBORG HAS IMPLEMENTED A COMPREHENSIVE, FORWARD-LOOKING 'MASTERPLAN' THAT AIMS TO MAKE THE AREA CARBON NEUTRAL BY 2029.

The project is based on the conviction that education is vital at all levels. Energy consultant courses were organised for municipal service workers and efforts were made to educate the area's tradesmen and unskilled workers in energy renovation techniques. As part of their activities, 1,200 homeowners have received free energy advice.

This campaign drove up interest and demand for contractors who could implement energy renovations. Moreover, financial support was secured by working with the banks in the area – and with building professionals – to understand cash flow in energy renovations and competitive loans for house-owners.

The holistic and forward-looking approach used in this small Danish town is replicable at Member State and EU level. The first step should be for the EU to ensure the drafting of effective national building renovation strategies (currently under Article 4 of the EED) through stronger requirements of clarification on how the countries will decarbonize their building stock.

#A strong collaboration between industry actors and local governments can foster an enabling environment and speed up the development of innovative projects.

Image source- Request2Action

HOW TO ACHIEVE IT?
POLICY RECOMMENDATIONS

THE UPCOMING WINTER PACKAGE IS A KEY MILESTONE TO INCREASE THE HISTORICAL LOW RETROFITTING RATES IN EUROPE.

Deep energy renovations require a systemic approach because of the interdependence of their phases – from design to execution to maintenance – and the interaction of external and internal actors. At the same time, the transformation of the building stock is also tied to the transformation of the energy and mobility system.

A combination of policy and support measures must be put in place to increase demand for renovations. Private or public one-stop-shop solutions is one way to guide building owners towards deep energy demand, and building renovation passports another.

With the upcoming Winter Package, the European Union has a key role in setting out the vision and targets for a decarbonised European building stock by 2050, along with the legislative and enabling framework (such as information and advice, financing, technical assistance and standardisation).

Policy-makers at national and local levels also play a central role in supporting implementation on the ground and by encouraging cities/regions to go beyond national targets (see Project Zero). Local government can also play a facilitator role in initiating a project and helping create the conditions to make it successful.

The private sector also has a key role to play in implementing the key success factors identified, notably in business model setting and the development of new products - for instance, by providing consumer-tailored services, offering an "à la carte" of options designed to meet their specific needs and aspirations, or by developing new low- or zero-carbon technologies and products. And in order to mitigate legislative obstacles for innovative and new business models, making sure that the policy framework is dynamic will be essential.

POLICY RECOMMENDATIONS

INCORPORATE A HARMONISED ENERGY RENOVATION TARGET IN THE EPBD

Push, pull and enable deep energy renovation through European legislation. A harmonised energy renovation target would raise the bar for Member States and guide the market.

ESTABLISH A DYNAMIC LEGISLATIVE FRAMEWORK

A dynamic legislative framework is required, which allows for the development of new products, solutions and business models and can be flexibly adapted as the market evolves. The EU's Winter Package should foresee and facilitate a level playing field, encouraging innovative thinking.

INTRODUCE THE CONCEPT OF RENOVATION PASSPORTS IN THE EPBD

The current EPC systems need to evolve into building specific renovation roadmaps, providing advice - tailored to the owner's preferences and possibilities - on how to lay out a stepwise, holistic renovation over a longer period.

ENCOURAGE RENOVATION PROGRAMMES TO ADOPT A SYSTEMS APPROACH

Establish renovation strategies that encourage clustering of projects and integrated system solutions. This will lead to economies of scale and avoid lock-in effect of single measure incentives.

PUBLIC AUTHORITIES TO LEAD BY EXAMPLE

An increased rate of deep energy renovation of buildings from all governments (EU, national, cities) would provide a learning laboratory and be a positive injection into the market.

UNLEASH THE FINANCIAL FLOWS TARGETING ENERGY EFFICIENCY

Public authorities should recognise energy efficiency as an infrastructure investment, reviewing the definition of an asset to make it easier to associate energy performance contracts with public-private partnerships and incorporate the future cash savings in the calculation of investment costs in energy performance contracts.

THE ENERGY PERFORMANCE CERTIFICATE SHOULD INCLUDE THE ASPECT OF A BUILDINGS' SMART-READINESS

A smart-ready building stock would boost the integration of renewable energy sources and enable a rapid increase of electric vehicles.

Want to dig deeper into the subject? Read the full report:
Scaling up Deep Energy Renovation - Unleashing the Potential through Innovation & Industrialization