



# Deep Energy Renovation

Proof of What is Possible Today



## Adrian Joyce



## Renovate Europe Campaign Director

Since 2011, the Renovate Europe Campaign (REC), together with research from around the world, has brought attention to the need for deep energy renovations in the EU. As we move towards the Campaign's 10th anniversary, we are showing policymakers that the ambitious objectives that we have been promoting are not only achievable but are already all around us.

Carefully selected for exhibition in October 2019, we highlight 23 projects and 6 incentive programmes that span a wide range of building types and construction techniques. Each tells its own story and many of the projects are accompanied by video testimonials from residents and occupants of the energy renovated buildings.

By shining a spotlight on these projects, we hope to prompt policymakers at all levels of governance to be courageous in bringing forward ambitious, long-term renovation strategies that will rapidly advance towards the achievement of a highly energy efficient and decarbonised building stock in the EU.

Our message to policymakers is to take action! Those who do will reap the diverse and valuable rewards that arise when people are more comfortable, more productive, healthier and more prosperous. When we prioritise people and accelerate renovation, we all benefit, we all win and secure a better future for ourselves and future generations.

I am most grateful to my own staff who work tirelessly to ensure that all actions and activities of the Renovate Europe Campaign are of the highest quality. I am also indebted to the REC partners that have made this work possible, and offer a special 'Thank you' to those that contributed extra for Renovate Europe Day 2019 (REDay2019): UTC, Danfoss, VELUX and EURIMA.

Finally, I thank our three co-hosting Members of the European Parliament and their staff: Ciarán Cuffe, Greens/EFA (IE); Pernille Weiss, EPP (DK); and Theresa Griffin, S&D (UK). Such cross-party support for our work encourages me to believe that we have a higher chance of success in our objective of achieving an 80% reduction in the energy demand of the building stock in the EU by 2050.

## Theresa Griffin



## Member of the European Parliament S&D (UK)

Having been a supporter of the Renovate Europe Campaign since my election in 2014, I am delighted that once again the Campaign will organise its REDay2019 events inside the European Parliament and I am pleased to be co-hosting the events together with my colleagues Ciarán Cuffe (Greens/EFA) and Pernille Weiss (EPP).

The issue of deep renovation is close to my heart as I see far too many families across the EU that are suffering from energy poverty in poorly constructed or maintained buildings. I care passionately about finding the ways to alleviate their suffering and I see deep energy renovation as a key sustainable path to this goal.

I am grateful to the Renovate Europe Campaign for compiling this brief that will accompany its exhibition of best case renovation projects and programmes from all across the EU and I trust that it will help to further raise the awareness of policymakers and legislators that the challenge we face is surmountable and that they will be brave enough to introduce the needed regulations in the near future.

For my part, I will continue to advocate for ambitious energy renovations on behalf of all Europeans and I hope to see the day when energy poverty in the EU is a thing of the past.



## Ciaran Cuffe



## Member of the European Parliament Greens/EFA (IE)

The built environment is all around us, every day. We all spend the vast majority of our time inside buildings, making them very important for our quality of life. As policymakers in the European Parliament we have the responsibility to ensure that the framework directives on which much of national law and regulation is based is properly and coherently framed.

This is nowhere more important than in the buildings sector and never more important than now in times of climate emergency. It is a well-established fact that the buildings sector consumes about 40% of all the primary energy produced in the EU and that leads to the release of about 36% of all energy-related CO<sub>2</sub> emissions into the atmosphere. It is also well known that most of the buildings built and occupied at the present time are highly energy inefficient and that they waste most of the energy delivered to them.

It follows that until we can address this very large waste of energy in the buildings sector, we will not get on the road to a carbon-neutral Europe, a goal that I cherish very much and that is necessary if we are to reach our commitments under the Paris Agreement.

And that is where the Renovate Europe Campaign comes in, a Campaign that is calling for an 80% reduction in the energy demand of the building stock in the EU by 2050.

One of the factors that I perceive as an obstacle to action on existing buildings is the view of many politicians and policymakers that what needs to be done in the buildings sector cannot be done because the results demanded are too ambitious. As a trained architect, I know that this is not true, and it is why I have been delighted to be the main sponsor of the Renovate Europe Exhibition in the European Parliament.

The title of the exhibition is telling: *Deep Energy Renovation: Already All Around Us* and it contains 23 best case examples of a wide range of building types (including heritage buildings) that have been energy renovated to very high standards. The exhibition also contains descriptions of six incentive programmes that are available to encourage building owners to take on the energy renovation of their properties.

I am delighted that the Exhibition and the Moderated Debate that are being held in conjunction with each other are being co-hosted by my colleagues Pernille Weiss (EPP) and Theresa Griffin (S&D), showing that the issues addressed by the Renovate Europe Campaign are truly cross-party and relevant for all people in the EU.

## Pernille Weiss



## Member of the European Parliament EPP (DK)

In Europe, over 95% of our buildings are not reaching satisfactory energy performance standards. This means that our citizens are not living and working in the best conditions. In my view this is not acceptable and has to be urgently addressed.

I understand the complexities of addressing the challenge of dramatically improving the energy performance of our buildings as I previously owned and ran a consultancy in Denmark addressing the linked issues of architecture and health. I also know of the great benefits that will result from the implementation of ambitious long-term renovation strategies in the countries of the EU and they include the creation of quality local jobs, improved health and well-being among occupants and the creation of vibrant, forward-looking industries that will be world leaders in energy renovation technologies and techniques.

For all these reasons, I am delighted to give my support to the Renovate Europe Campaign, which has been raising awareness of the urgent need to deeply energy renovate our building stock in the EU. Together with my colleagues Ciarán Cuffe (Greens/EFA) and Theresa Griffin (S&D), I invite you to explore the contents of this short brief that sets out why we must address energy waste in buildings and that points to a wide range of successful and impressive examples of renovation projects that are already all around us.



80%

less energy



**Calling for an 80% cut in energy waste from buildings by 2050, the Renovate Europe Campaign (REC) is in line with findings from the International Panel on Climate Change (IPCC) that such aggressive reductions are needed to reach the COP21 Paris Agreement target of constraining global temperature increases to less than 1.5°C.**

Globally, the European Union (EU) is well recognised for strategic policy action with long-term goals in mind, including the recent Clean Energy for All Europeans Package, the Communication on a Carbon-Neutral Economy by 2050, and legal requirements that all new building are nearly-zero energy after 2020 and highly energy efficient and decarbonised by 2050 (as per Articles 9 and 2a, respectively, of the revised Energy Performance of Buildings Directive).

In addition, when elected in 2019, Commission President Ursula Von Der Leyen committed to putting climate action first on the EU agenda. Finally, a large number of Members of the European Parliament (MEPs) fully back the Renovate Europe call and others have specifically asked for more aggressive action.

### But current actions fall far short of long-term aims...

While acknowledging important policy progress, Renovate Europe is compelled to sound alarms about the massive scale of the challenge implied in such targets and timelines.

- **97% of existing buildings in the EU need partial or deep energy renovation.**
- **the rate of renovation must be ramped up quickly** – from current rates in Members States in the range 1%-1.5% of the building stock annually to rates of 3%-5%.

### ... and miss the obvious opportunity

Heating accounts for 60%-65% of energy use in EU buildings, with gas and oil providing about 62% of total heating energy inputs. As a result, heating accounts for about 18% of total greenhouse gas (GHG) emissions in the EU.

This brief highlights case studies of deep energy renovations across diverse building types in multiple EU countries, demonstrating that such projects are not only financially feasible but deliver substantial economic and social returns on investment.

The proof presented in the following pages is a direct response to the perplexing focus in recent policy that prioritises behavioural change, adjusting the fuel mix and upscaling the use of biomass. Such measures are not without warrant, but even in combination, they lack the ability to quickly, significantly and permanently cut GHG emissions. Within the buildings sector, only deep energy renovations, focused on reducing energy demand in buildings, can truly deliver the stated climate change goals.

Our intent in this brief is to show how deep renovation can be – and, indeed, is already being – done. A final section addresses the role of policymakers in establishing a policy environment that stimulates bold innovation, bold investment and bold action by all stakeholders.

### 10 Member States demand a “credible and detailed” path to full decarbonisation by 2050

**Denmark • Finland • France • Italy • Luxembourg • The Netherlands • Portugal • Slovenia • Spain • Sweden**

In November 2018, ahead of the release of the European Commission’s landmark climate strategy, energy and environment ministers from 10 countries issued a strong call for clear direction towards net-zero greenhouse gas (GHG) emissions by 2050. In an open letter, they specifically noted the need to set an EU GHG emissions reduction target of at least 40% in 2030, taking into account the principles of equity as well as cost effectiveness.

Notably, they called on the Commission to “examine the consequences of not acting and compare them with positive impacts of an ambitious ecological transition, notably the economic and employment opportunities, the improvement of the quality of life, the benefits for air quality, human health and biodiversity, etc.”

With buildings accounting for nearly 40% of EU emissions, such a target can only be achieved through a major escalation of current energy renovation efforts.



# Case Study: Croatia

## Strategic approach to deep energy renovations delivers quick returns with long-term benefits

Across the western Balkans, buildings and homes are notoriously inefficient, reflecting the late introduction of building codes that often fell short of best practices even at the time they were implemented.

Having been awarded €411m in Structural Funds,<sup>1</sup> the government in Croatia is pursuing deep energy renovations on a very impressive scale for the EU. Already, between 2014 and 2016, approximately half of this funding (€220m) transformed more than 15,600 family homes, 2,300 multi-unit buildings, 80 commercial buildings and 262 public buildings.

Importantly, many of the projects are helping to refine models for public-private partnership through collaboration with energy service companies (ESCOs). Typically, the government draws on the Croatian energy efficiency fund to front 40% of costs while ESCOs mobilise 60%. Building owners or operators agree in advance to repay the ESCO's up-front investment with finances freed up through substantially reduced energy bills.

Such projects also boost local economies by engaging local companies, many of which hire and/or train new employees. To date, approximately 3,000 construction jobs have been created.

<sup>1</sup>Covering the period 2014-20

### Deep renovation can save money, offer healthier environments

The Karlovac hospital, near Zagreb, serves an area of about 140,000 people and sees 1,500 patients daily. Over just four months of renovation works, undertaken with minimal disruption to patients and staff, the hospital was upgraded through a full renovation of the building envelope and the installation of new heat pumps and cooling systems, while the addition of solar thermal collectors now means 25% of its energy supply is both renewable and self-produced.

Annual heating costs are expected to drop by 54%, as will CO2 emissions. Such savings mean the upfront investment of €7.2m investment will pay for itself in just 14 years while having a climate mitigation effect equal to planting 113,000 trees.

In Split, a similar renovation of a public hospital produced almost identical results for reduced energy consumption while the renovation of a swimming pool achieved 71% energy savings.





51%  
less energy

after





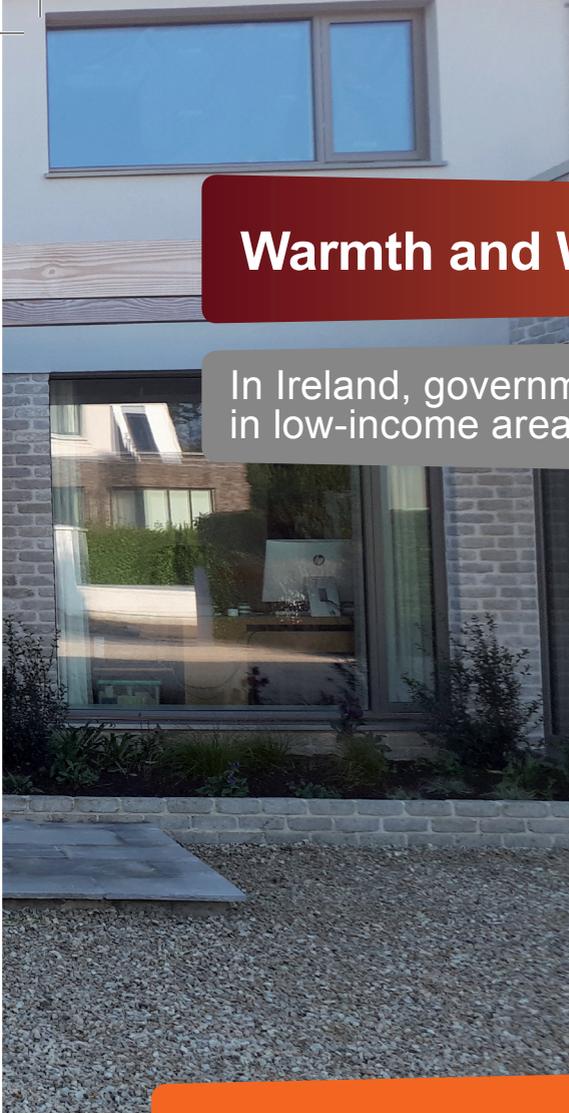
8  
%  
less energy



after

before





## Warmth and Well-being

In Ireland, government invests heavily in low-income areas

In a direct bid to aggressively tackle energy poverty, the Warmth and Well-Being (WWBS) pilot scheme is offering 100% grants to 900 homes in five Dublin postcodes that suffer from high levels of deprivation. The grants support home makeovers that can involve standard attic insulation with appropriate ventilation, wall insulation of the cavity, dry lining or external insulation systems, boiler replacements and draught proofing.

With the aim of scientifically proving the causal – and cost-effective – links between home energy renovations and health benefits, the grants target particularly vulnerable residents, such as children under 12 years and adults over 55 who suffer chronic respiratory conditions. Early results suggest that the project has made a real difference to their lives; more rigorous data will be collected as the pilot continues and upon its completion.

The Sustainable Energy Authority of Ireland (SEAI), which leads the WWBS programme, reiterates its focus on reducing the energy bills and improving the comfort of people in energy poverty, who may never be able to upgrade homes themselves. “Hopefully, it will clearly show that by spending money on these upgrades, obviously carbon emissions targets can be more easily reached and there will be an impact on the exchequer in terms of reduced spending for hospital visits,” says the SEAI’s Aileen Duffy. “People will live longer, with lower winter mortality rates and that will powerfully make the case for focusing on the home, where people spend so much of their time.”

*“Comfort is often spoken about. A lot of the time, people are living in discomfort to keep the bills down. Two brothers living together became so much more sociable because their health improved after the house was done up. They were so poor that they didn’t want to have people visiting them before. That had an impact on mental health as well. They said that the project had opened up a new phase in their lives,”* said one official working on the programme.





## Why Buildings Matter for Climate Goals and for Daily Life



In today's societies, people spend more than 90% of their time indoors. Conditions in these indoor environments – temperature, lighting, humidity, draughts and noise – play an important role in peoples' physical and mental wellbeing. Poor indoor environment conditions can also lead to illness that translates into costs for individuals and healthcare systems.

Three factors warrant consideration:

First, people who are already vulnerable because of age, ill health or poverty tend to spend even more time indoors, and thus suffer greater exposure.

Second, new insights are emerging about the health dangers associated with the effects of climate change – which may drive more people indoors for more hours per day.

Finally, a great deal is already known about the links between poor quality buildings, energy poverty and poor health. Studies suggest that one in ten Europeans – around 54 million people – are unable to adequately heat their homes in winter and that poor housing conditions are linked to one-third of Europe's 250,000 excess winter mortalities. Recent estimates suggest twice as many people cannot afford to keep their homes properly cool in summer.

Making buildings more energy efficient and improving indoor air quality delivers a wide range of benefits to people and societies. In its 2018 *World Energy Outlook*, the International Energy Agency calculated that slashing consumer energy bills, energy imports and alleviating energy poverty could deliver benefits worth €500 billion per year.<sup>2</sup>

<sup>2</sup><https://webstore.iea.org/market-report-series-energy-efficiency-2018>



## Deep Energy Renovation: Already All Around Us

Three examples of large-scale and/or particularly challenging deep energy renovation projects demonstrate not only the financial case for investment, but also substantial returns in the form of emissions reduction and economic and social benefits<sup>3</sup>.

## Public-private partnership (PPP) delivers 'wins' across public buildings in Slovenia



*Energy savings: 8,245 MW  
Efficiency increase: 70%-85%  
(depending on the building type)  
Emissions reduction: 2.96 Mt/year  
Financial savings on avoided energy use: €1 m/year.  
Cost of the works: €14.8m for the 48 projects  
Payback period: 15 years*

Having been named the European Green Capital for 2017, the City of Ljubljana (Slovenia) faced a major challenge: it needed to carry out deep energy renovations across 48 public buildings (e.g. schools, libraries, cultural institutions, sports centres). Not surprisingly, securing sufficient funding was a huge hurdle, which prompted the City to launch a call to establish a PPP.

Ultimately, the City joined up with two key partners: Petrol, the largest Slovenian energy company and Resalta, a large energy services company (ESCO). To date, an impressive 25 of the 48 buildings are in the process of deep energy renovations (with some already completed). The remaining 23 are protected structures under Slovenian regulations, which constrains some works; however, they are still being renovated to a high standard.

Measures implemented include insulation of roofs and walls, replacement of windows and doors, installation of renewable energy sources covering 25% of energy need, new heating systems, and connection of all buildings to a central building energy management system that enables remote monitoring, operation and data collection.

Occupants of all buildings say the indoor environment is greatly improved and they are reaping the benefits in terms of better health and well-being. Additionally, with more than 100 contractors employed, the project has helped economic development in the city. This PPP won an award from the EU-funded project known as GarantEE.





## Schools • Efficient classrooms get high marks for student performance

Student health, attendance, concentration and learning performance all suffer when school buildings are poorly designed or have outdated systems. The occupancy density of classrooms is much higher than in homes or offices and children are more vulnerable to the indoor air quality as they breathe more air relative to their body size than adults do. In fact, every 100ppm decrease in indoor CO<sub>2</sub> concentrations is associated with a relative decline of 0.1%-1% of absences due to illness.

Modelling carried out by the Buildings Performance Institute Europe (BPIE) estimates that school renovations could allow children to improve academic performance by 3%-8% – equivalent to ten fewer school days per year. Within the 20°C-32°C range, every 1°C reduction in temperature increases student learning performance by 2.3%. This could translate to additional time for teaching, extra-curricular activities or vacations, or reduce education costs through a shorter year.

Good daylighting can also help boost attention spans, concentration and relaxation, increasing academic performance by up to 18%!

## Hospitals • With faster recovery, more patients can be served

In hospitals, a healthy interior can make the difference between life and death. Good ventilation reduces the risk of cross-infection while daylighting, thermal comfort and good soundproofing accelerate patient recovery times.

Startlingly, one study from 2014 found that improved indoor environmental quality at a children's hospital would lower mortality rates by 10% and increase the time doctors can spend with patients by the same amount. More broadly, health renovations could cut the average length of patient stays by 11% while also shaving medication costs and employee turnover by 20%. In the EU alone, the cost benefit was tallied at €114 billion per year.

## Public and private workplaces • Energy demand drops, productivity climbs

Around 36% of the EU workforce – i.e. 81m people — spend eight hours per day (or more) working in offices. In turn, about 90% of operating costs are linked to employees. Renovating for comfortable, healthy, well-lit and thoughtfully designed workspaces improves staff morale and reduces turnover. It can also boost employee productivity by up to 12%.

Across the EU, every percentile improvement in building performance could add €40 billion to the bottom line of EU business. All things considered, healthier workplaces could save a staggering €500 billion annually.

Further analysis found that every 1°C reduction in temperature in the 22-32°C temperature range increased a worker's performance by up to 3.3%. And every 100ppm decrease in CO<sub>2</sub> concentration increases their performance by 4.25%.

<sup>3</sup>Content on this page regarding the benefits of deep energy renovations is drawn from an in-depth report published by the Buildings Performance Institute Europe (BPIE) in 2019:

<http://bpie.eu/publication/building-4-people-valourising-the-benefits-of-energy-renovation-investments-in-schools-offices-and-hospitals/>

## Multi-family housing offers economies of scale

**Renovation tops demolition, delivers massive savings  
Bordeaux, France**

*Building type: Multi-family social housing*

*Size: 67,500m<sup>2</sup>*

*Year of construction/renovation: 1960/2016*

*Energy savings: 60%*

*Cost of the works: €28 m (€415/m<sup>2</sup>)*



The *Grand Parc* complex comprises three social housing blocks built in the early 1960s. Slated to be torn down, a thorough assessment demonstrated the potential for deep energy renovation to cut energy demand and emissions while also increasing useable space, improving daylighting and significantly upgrading comfort for the residents of 530 dwellings.

To reduce the duration of the works, the project used prefabricated modules to the south façade and insulation of the north façade of the buildings, which created opportunity to also add a winter garden to

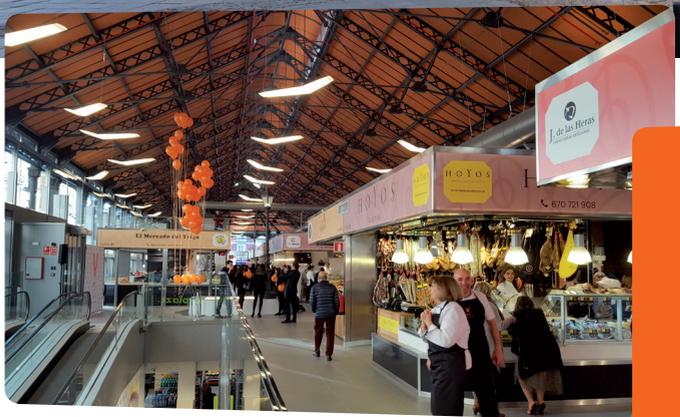
each apartment. The complex was equipped with a new heat recovery ventilation system and all new electrical installations. Additionally, new, bigger elevators improved movement of people within the building while ground-floors were modified to make access halls more open and transparent.

Remarkably, the final costs of the works were three times less per apartment than the cost of demolition and rebuild would have been and, as renovation works on each apartment were completed in just two days, residents were not required to move out. Importantly there has been no increase in rent.

# 60%

less energy





**Breathing new life into an iron market  
Valladolid, Spain**  
*Building type: Heritage / iron market  
 Size: 2,230 m<sup>2</sup> (after works completed: 41 stalls)  
 Year of construction/renovation: 1882/2016  
 Energy savings: 54%  
 Cost of the works: €10.4m*

## Heritage buildings harbour surprising potential

The Mercado del Val, a 19<sup>th</sup>-century iron market, remains a centrepiece of Valladolid City, in turn the capital of the Castilla y Leon region and a leading economic and commercial centre in north-western Spain. Making the market ‘fit for purpose’ as a modern commercial centre while protecting its architectural and historical significance faced some technical constraints, but the end results are still impressive.

A multi-functional, modular façade was installed, with glass windows that let in natural light while shutters can be closed to regulate associated heat gain. Geothermal heat pumps were installed to meet demand for heating as well as cold and hot water while roof skylights provide natural ventilation.

In parallel, a modern energy management and monitoring system (iBEMS) now allows optimal control of all technologies. The market now also has its own waste sorting and treatment plant, operated in partnership with municipal services.

Mercado del Val is recognised as a front-runner for energy performance, renewables and the use of natural light. The renovation works were carried out as part of the CommONEnergy project, which aims to reconceptualise shopping centres through deep energy renovations, thus improving the social and environmental impacts of commercial spaces.



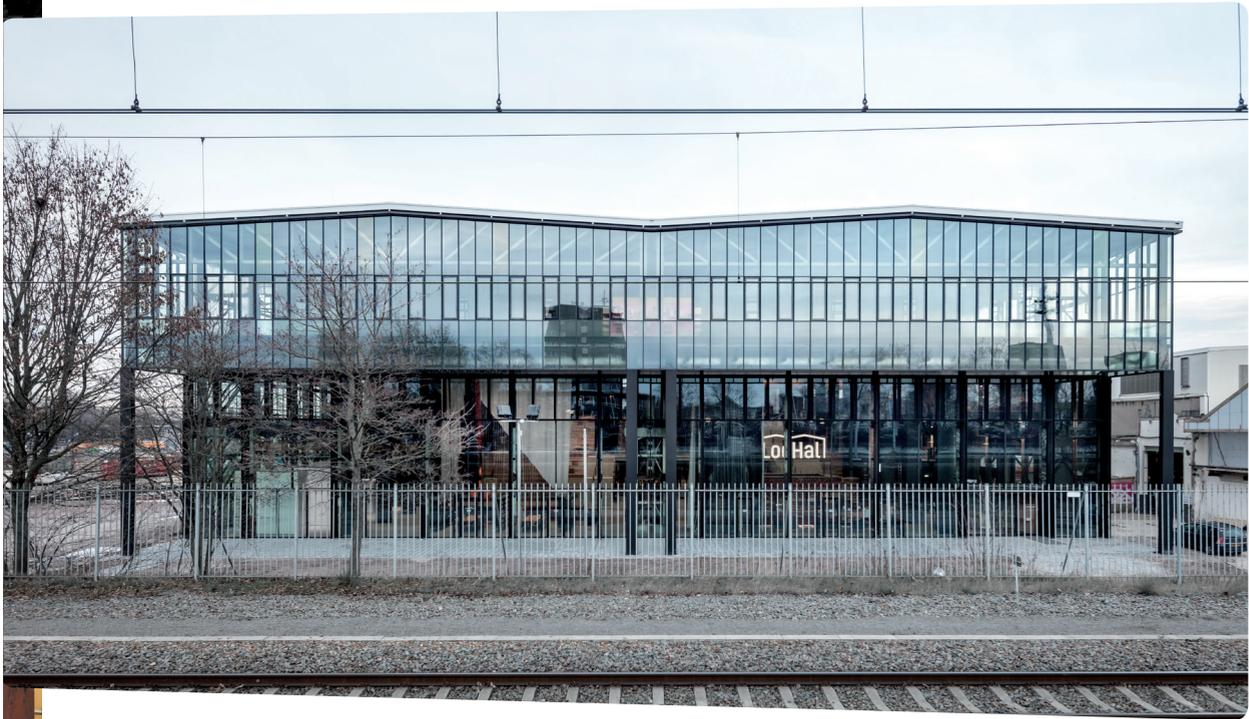
# Disruption and Digitalisation in the Buildings Sector

The global construction sector has been valued at \$10 trillion per year, according to a recent McKinsey report.<sup>4</sup> Yet, in sharp contrast to productivity increases of 1,500% in manufacturing, retail and agriculture, productivity in construction has barely changed since 1945. In fact, today's building projects are typically delivered 20% past schedule and up to 80% over cost.

But rapid change is underway in terms of what buildings are made of and how they are constructed, as well as in their efficient operation. Production processes are moving from installation to assembly while labour is evolving from physical to technical – all of which means lower energy consumption and environmental impacts over the full lifecycle of a building.

*"Digital solutions have great potential to increase productivity, reduce construction costs, alleviate burdensome and physical tasks, improve data collection and analysis of energy efficiency performances, and lower life-cycle costs of buildings."* Eugenio Quintieri, European Builders Confederation (EBC).





## Bringing industrialisation to renovation

Renovation has long been considered difficult and costly as each project requires up-front analysis and custom solutions. The Dutch Energiesprong project is proving such thinking to be outdated. Through greater use of digitalisation and prefabricated, modular components, the project is reducing costs and improving conditions, in part by moving much of the work indoors (i.e. away from job sites subject to the whims of the weather). Applying prefabricated modules to the exterior of terraced houses, for example, can be done in just one week, and includes up-grading and synchronising of internal building systems at the same time. But this approach requires a certain scale of project and different business models.

## Automation: Intelligent drones, robots and cobots join the workforce

The hard labour of construction, including deep energy renovation works, may soon be largely handed off to a new workforce in the form of smart machines that are completely automated (robots) or that collaborate with humans (cobots and drones).

With artificial intelligence delivering new capacities, the timeline for widespread deployment of autonomous or semi-autonomous robots that can communicate with – and even learn from – each other is ‘just over the horizon’, according to experts.

## Getting to know the digital toolkit

In the buildings sector, ‘digitalisation’ covers a wide range of phenomena from increased use of prefabricated materials, often involving 3D printing, to virtual reality modelling and other processes.

Building information modelling (BIM) is, by far, the most ubiquitous digitalisation technology currently used in construction. Allowing 3D site modelling and virtual reality experiences in real time – i.e. as a building site advances – BIM gives architects and engineers more data and better telemetry that can be quickly factored into decisions about site equipment or contractor needs. That leads to smoother, faster and more accurate construction and renovation projects.

<sup>4</sup><https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/imaging-constructions-digital-future>





## Where Can Policy “Power Up’ Actions?

Many policymakers now recognise the “huge potential” of highly energy efficient and decarbonised buildings to accelerate emissions-cutting programmes. Yet when reviewing recent and proposed policy initiatives, a baffling disconnect emerges between diagnosis and prescription: some place heavy emphasis on yet-to-be proven technologies such as carbon capture and storage while under-utilising the massive potential known to exist in energy efficiency.

Among the larger energy efficiency community, short-term measures and changing priorities that follow election cycles are an overarching problem in the policy arena. Both create a ‘stop-go’ dynamic that erodes the certainty investors and businesses need to effectively plan ahead. Additionally, heavy bureaucratic processes are a major disincentive.

Here, we highlight specific areas in which policymakers should act strategically and rapidly to accelerate the rate at which the benefits of energy efficiency can be captured.

## Funding and financing

The burden of upfront investment is one of the largest barriers to deep energy renovations, affecting both large- and small-scale projects.

The business case for energy efficiency loans or investments remains poorly understood by many banks and pension funds, although the situation is improving. Efforts at EU level include the work to create green mortgages that will be offered at every corner bank and de-risking approaches tailored for energy efficiency projects.

The EU seems willing to make important adjustments. With increased ringfencing of funds for climate mitigation, the next Multi-annual Financial Framework (MFF) for the period to 2027 shows prospects for a sustained and effective focus

on energy renovation in the decade ahead, which will put Europe at the forefront of the global clean energy stage. The Commission has plans to convert the European Investment Bank (EIB) into a Climate Bank (at least partially) and to establish a Building Renovation Fund.

Funding and financing is particularly challenging in the residential sector, where the greatest need may be among those that can least afford energy renovations. A recent survey found that 60% of tenants worried that landlords who carried out energy renovations would seek higher rents, while 58% of owners were anxious about repaying for renovation loans and 53% were deterred by the lack of government support for costly work.

### The funding opportunity from carbon revenues

Revenues from the EU Emissions Trading System (ETS) have been increasing as a result of its recent revision. Member States are requested to ensure that at least 50% of the revenues are spent on climate-related actions. But are they doing this effectively and efficiently?

A recent report from the Regulatory Assistance Project (RAP) finds that, at a price €20, each tonne of carbon saved costs consumers €248. In sharp contrast, 7-9 times more carbon can be saved when revenues are directed to energy efficiency, including energy renovations, which also delivers multiple benefits to consumers and the economy.

Carbon revenue generated by Member States is expected to total €165bn over the next 10 years. At present, there is an annual gap of €130-200bn in investment needed to reach the 2030 energy savings target. With 80% of the investment needed on the demand side, and 71% of demand-side investment needed in the residential sector, this opportunity to use carbon revenues must not be missed.

Carbon pricing will carry costs for consumers but investing in renovations that lower their energy demand and energy bills is one way to buffer those costs, particularly for households already affected by energy poverty. Ultimately, energy efficiency also serves as a way to build fairness into the clean energy transition.

Source: <https://www.raponline.org/knowledge-center/carbon-leverage-investing-europes-carbon-revenues-in-european-energy-efficiency/>



## Addressing employment concerns

The building industry has long been characterised as involving physically exhausting and rather low paid work with ill-defined career paths. The European Builders Confederation (EBC), which represents construction SMEs and craftsmen, says that as demand grows for new builds and renovations, this perception combined with an aging workforce threatens to create a massive labour shortage. In the United Kingdom alone, 700,000 construction employees are expected to retire by 2030.<sup>5</sup>

With advanced technologies transforming both the work involved and how it is done, the opportunity exists to attract young, creative people or to offer re-skilling for those whose traditional jobs may become obsolete. This evolution may also make construction a less dangerous vocation, including through the use of robotic 'exoskeletons' that take over some of the heavy lifting required, which often leads to injury and/or early retirement.

With women currently accounting for only 10% of the construction workforce, many organisations are keen to use these changes to boost recruitment.

### Time for a reputation make-over in the buildings sector

Industry insiders have some pithy insights to offer on the looming labour shortage. The 'digital natives' of the iPhone generation expect to be able to interact – via phones, tablets and even watches – with whatever environment they are in.

To date, the buildings sector suffers from the perception that it is "not very sexy" and "not very sophisticated." In reality, the digital tools emerging have potential to make it 'hip' and in line with growing interest in working for a more sustainable future.

To design, build and operate smart buildings, the sector needs smart, tech-savvy people. Every voice-activated, cloud-based app that lets a smartphone regulate complex HVAC systems or control the temperature of a single room requires adept coding and intuitive design.

Action that ensures targeted training of sufficient workers must be included in a strategic suite of policy measures.

## New building approaches create need for new business models

Industrialisation of the renovation process delivers clear benefits, as noted earlier. But, as highlighted by the Buildings Performance Institute of Europe (BPIE) and Industrial Innovation for Competitiveness (i24c), it only works when a segment of the building stock (e.g. a row of terraced houses) is identified as having 'similar' characteristics across which prefabricated components can be mass produced off-site – i.e. when the job is big enough and standard enough to support economies of scale.

At present, 92% of companies working in the construction sector are small and medium-sized enterprises (SMEs). Many are subcontractors that provide, among other things, data for BIM inputs and other software. Truly scaling up industrialisation with state-of-the-art IT infrastructure across the supply chain means equipping thousands of SMEs with systems capable of storing the vast amounts of data that will flow from BIM, drones, robots, etc. to support use of 3D printing and prefabricated modules. It means engaging construction micro-, small- and medium-sized companies, as well as craftsmen, with specific training, with funding support, and the right regulatory framework.

Past EU Commission President Jean-Claude Juncker understood the need for policy support in this area, promising that the EU would be united in pushing for more support for SMEs and investing in the workforce, including income support measures and training/re-skilling.

<sup>5</sup>[www.thehrdirector.com/features/skills-shortage/uk-construction-industry-resourcing-crisis/](http://www.thehrdirector.com/features/skills-shortage/uk-construction-industry-resourcing-crisis/)

# Croatia • Progress in Key Areas, Outstanding Challenges in Others

## Disrupting accounting rules and risk allocation

Croatia's energy efficiency champions have been frontrunners in an interpretation of accounting rules that Eurostat recently confirmed is correct and can now be applied across Europe. This states that ESCO's must carry the risks for cost overruns, delays, failures to meet energy saving commitments, etc. on these projects. In return, they reap the rewards.

## Favourable financing terms attract investors, uncertainty keeps them wary

The Croatian Bank for Reconstruction and Development recently began extending credit lines for energy efficiency projects on extremely favourable terms. Investors, however, still perceive the lack of continuity in EU funding as a risk factor. Despite being keen to launch new projects, they very often feel that they may become *de facto* hostages to budgetary decisions in Brussels and/or national capitals. Lack of information about post-2020 MFF funding turns opportunity – in the form of a €40m public call for tenders on commercial buildings – into a potentially risky challenge for the country's energy efficiency community.

## New procurement procedures deliver sevenfold improvement in approval timelines

Making public procurement more efficient has been a key element of the Croatian strategy's success. Renovation contracts have been made simpler, more standardised and more transparent: compared with traditional practices, they are now completed up to seven times faster with significantly lower administrative and total costs. Additionally, relevant investments have been tightly codified: they must take the form of energy performance contracts negotiated in an open tendering process and guarantee minimum 50% energy savings with no new costs for public budgets.

after



## Forging Ahead Through Strategic Collaboration and Targeted Action

An overarching ‘lesson’ emerges from case studies highlighted by the Renovate Europe Campaign – i.e. that the alliance of government entities, industry players, social organisations, building operators and occupants underpins the success of deep energy renovations.

Additionally, the examples show where ‘big wins’ can be achieved to quickly deliver substantial energy savings and GHG emissions reductions while also lifting people out of energy poverty, with the additional benefit of improving their health and well-being.

Partners of the Renovate Europe Campaign are committed to achieving EU energy and climate goals; collectively, they have the knowledge and expertise to both advise policymakers and develop and deploy new technologies across the entire building renovation supply chain.



before





# RENOVATE EUROPE

Champions Together for Renovation

## About the Renovate Europe Campaign

The Renovate Europe Campaign is a Brussels based political communications campaign whose ambition is to enable the reduction in the energy demand of the building stock in the EU by 80% by 2050, transforming it to nearly zero energy building standards.

To achieve this ambition, it will be necessary to rapidly increase the energy renovation rate of buildings in the EU to an annual rate of 3% and to maintain that rate until 2050. In addition, it is essential to substantially increase the level of projected savings whenever a renovation is being planned.

Renovate Europe adopts a technology neutral and performance-based approach to its work and communicates to policymakers at all levels of governance from the EU to the national, regional and local levels.

The companies and associations supporting the Renovate Europe Campaign stand ready and willing to help policymakers to succeed in renovating Europe, notably by sharing best practices and promoting a better understanding of the importance and benefits of a fully energy renovated building stock to the EU, its citizens and for climate action.

By working together towards the realisation of the Renovate Europe ambition we can create millions of new local jobs, reduce our dependence on imported fuels, boost public finances, stimulate urban regeneration and improve quality of life for the citizens of the EU

**Renovate Europe Campaign**  
EuroACE

Rond Point Schuman 2, 8th Floor  
1040 Brussels, Belgium

#PrioritisePeople #AccelerateRenovation  
[www.renovate-europe.eu](http://www.renovate-europe.eu)  
@RenovateEurope