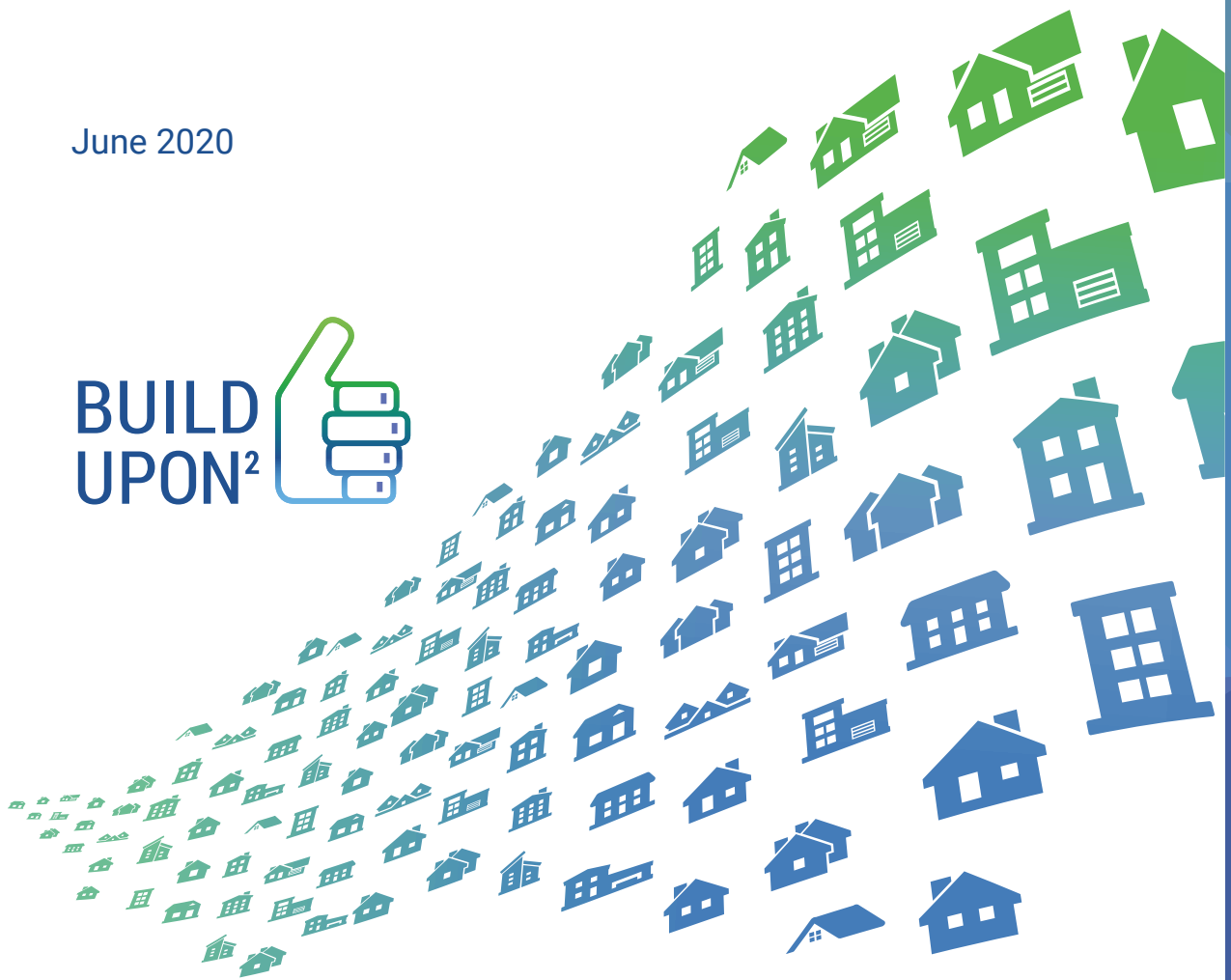


# Starting a Renovation Wave

## Putting Real Impact First

June 2020



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 840926



**The BUILD UPON² Project**

We are in a state of climate emergency. We must act now to reach net zero carbon by 2050 - and cities can lead the way. To get there, cities must unlock the huge potential of their buildings - and building renovation in particular.

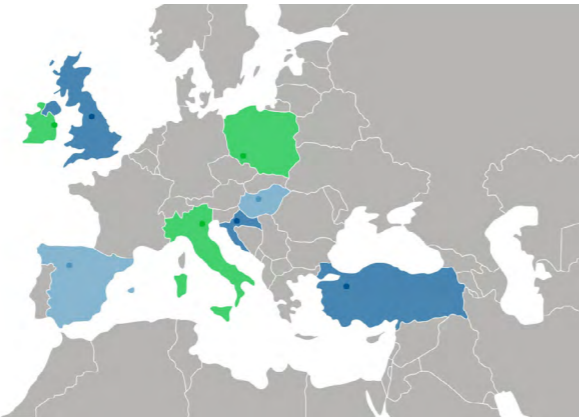
Deep building renovation has far-reaching benefits for society as increasing indoor comfort and air quality avoids illnesses and premature deaths associated with living in cold and damp homes. This in turn reduces pressure on healthcare and social services.

The EU Horizon 2020 funded BUILD UPON² project will empower cities across Europe to join forces with national governments and industry to decarbonise their existing building stock by 2050. BUILD UPON² will strengthen the local effectiveness and implementation of the national building renovation strategies required by the EU Energy Performance of Buildings Directive (EPBD).

[www.worldgbc.org/build-upon](http://www.worldgbc.org/build-upon) ➡

**BUILD UPON²'s Pilot Cities**

- Velika Gorica, Croatia
- Budaörs, Hungary
- Dublin, Ireland
- Padova, Italy
- Wrocław, Poland
- Valladolid, Spain
- Eskişehir, Turkey
- Leeds, UK



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**“Achieving real impact and fast must be at the heart of all our efforts in the green recovery. Cities and Green Building Councils are innovating in BUILD UPON<sup>2</sup> to establish impact frameworks to accelerate and educate.”**

**Cristina Gamboa,**  
**CEO, World Green Building Council**

**“Impact assessment should be a central part of each and every renovation effort, otherwise how on earth do we know how we are doing or even where to turn for best practice?”**

**Jan Rosenow, Director, European Programmes at Regulatory Assistance Project (RAP) - BUILD UPON<sup>2</sup> Advisory Board Member**

# Introduction

## Why *impact* matters so much to the Renovation Wave

Successfully scaling renovation rates takes a concerted, coordinated effort from a host of different actors: from policy makers, financiers and property agents to energy companies and consultants, product suppliers and local installers. And nothing can be achieved without the support and action of building owners and occupants.

Years of European research, investment and action to tackle the aging building stock have shown that there is no one-size-fits-all approach. But how can we know which solutions are most successful and in which contexts? **Only by tracking their impact.**

During the initial years of the BUILD UPON project, Europe’s Green Building Councils convened thousands of stakeholders and identified hundreds of programmes tackling the renovation challenge in all sorts of ways. But one feature stood out across the board: **almost all of these programmes lacked robust, long-term impact data.** Without this, we are flying blind. We are hoping to identify and scale the next good idea, waiting passively for a wave to ride with no idea whether the conditions are right.

**Creating a central focus on monitoring the real impacts of renovation initiatives, learning what is working, and learning fast what is not working and why - must be at the heart of the Renovation Wave. It is clear the capacity of all actors needs to be built here - both individually and collectively.**

BUILD UPON<sup>2</sup> goes to the very heart of this issue by building a renovation strategy impact framework to finally plug this gap and building the capacity of local actors to focus on real impact and learning. The impact framework is a tool to navigate the complex landscape of programmes and projects and to help policy makers at city, national and European level to really see what works and what does not. That tool is being co-created by hundreds of stakeholders from all parts of the renovation system across Europe, convened by Green Building Councils, and piloted by cities.

But the climate crisis demands we start the Renovation Wave now. And the economic fall-out from the COVID-19 pandemic makes that call all the more urgent as we look to the construction sector as a powerhouse to help us build a green recovery.

There have been several excellent reports in recent months with recommendations on how to deliver the Renovation Wave. With this report, the Build Upon<sup>2</sup> project aims to contribute further to the debate by identifying renovation initiatives that have effectively demonstrated their impact, or that are turning their attention to tracking impact in more sophisticated ways. Replicating these best practices now will ensure that we can learn as we go. Only then will our efforts result in a wave that builds and swells right across Europe, providing environmental, economic and social benefits for decades to come.

**Track impact - learn fast - build back better!**

# Key recommendations

## RECOMMENDATION ONE

The Wave will be local. It must be built on best practice examples of local initiatives that can evidence their impact and ability to scale over time

A successful renovation initiative should have demonstrable impact on the social, environmental, and economic issues that matter to us all. Impacts like emissions reductions, employment and health must be quantified across the region in a consistent manner.

In this way, policymakers at local, national and EU level will be empowered to replicate and scale investments in these best practices that really make a difference. This will help create a better built environment at the local level and ensure that these initiatives are truly delivering on the priorities of the EU Green Deal. [See Section One](#) ➞

## RECOMMENDATION TWO

The Wave will be driven by leaders and scale by regulating laggards

Mandatory minimum energy performance requirements have the potential to drive up building standards when implemented effectively and with clear timelines. Case studies suggest that their impact could be increased by leveraging new or existing voluntary initiatives and pledges on minimum performance.

Building a critical mass of support through voluntary commitments by sub-sectors of industry to achieve minimum performance standards by a set deadline could prepare the market for mandatory minimum requirements that can be ratcheted up over time.

[See Section Two](#) ➞

## RECOMMENDATION THREE

The Wave needs systemic yet simple approaches to tracking impact

Renovation of existing buildings is one of the most complex social, economic, and environmental challenges Europe faces. Systemic thinking is key to enable cities and local authorities to adopt impact metrics that are both meaningful and simple to track.

Impact indicators should aid fast learning and adaptation, highlight the interactions between different renovation initiatives and help identify the approach most suitable for a given location.

[See Section Three](#) ➞

## RECOMMENDATION FOUR

The Wave needs to convene people through platforms that multiply impact and learning

Convening local platforms that bring together the building and construction sector, local authorities and the unusual suspects - banks, lawyers, community groups and others - is key to solving the barriers to renovation.

Platforms require innovative governance models to ensure they are inclusive and gain consensus on the basis of local community needs. There should be clear communication channels to national and regional platforms to reinforce effective learning and policy making at all levels to overcome barriers to renovation.

[See Section Four](#) ➞

# Section one

## **The Wave will build on impactful local initiatives**

Renovations happen in a given place, at a given time. They are, by definition, local; involving local people and local businesses.

To reach scale, the Renovation Wave must be firmly rooted in this local context and build on the best practices that already exist in countless local initiatives across Europe. Best practice must not just be based on ‘things that seem like good ideas’, but we must invest further in those initiatives which are able to evidence the positive impacts they are having.

Every local context is different and flexibility and adaptability are key, but nevertheless, there are common themes and lessons that can be learned from looking at local programmes that are already showing real impact.

# Warmth and Wellbeing Scheme, Dublin

Where is it?	Dublin, Ireland
Who is it for?	Lower income households where there is a person living with a chronic respiratory condition
Impacts	<ul style="list-style-type: none"> <li>Over €23 million has now been invested in upgrading over 1,200 homes in the pilot area.</li> <li>Initial review of the energy impacts of the scheme has shown that the average Building Energy Rating of participating homes improved from a D2 to a C1-C2.</li> <li>Estimated annual emissions per home have reduced by an average of 2tCO<sub>2</sub>/year</li> <li>Participants noted improvement to their respiratory symptoms</li> </ul>
Dates	2016 onwards
Key lessons	<ul style="list-style-type: none"> <li>By embarking on joint policy initiatives governments can achieve desired outcomes across multiple policy areas, in this case health and climate.</li> <li>Collaboration is key. This programme is a collaboration between the Department of Communications, Climate Action and Environment, the Department of Health, Sustainable Energy Authority of Ireland and the national Health Service Executive.</li> <li>Personal experience is a powerful marketing tool - despite a healthcare provider referral process, it was not until participants heard from the positive experiences of others that they were inclined to take up the scheme.</li> <li>Data protection needs to be carefully addressed so it does not become a barrier to capturing and quantifying benefits.</li> </ul>

The Warmth and Wellbeing Scheme is a pilot scheme aimed at improving the living conditions of vulnerable people living with chronic respiratory conditions. It aims to validate, in an Irish context, the strong international evidence that making homes warmer and more energy efficient can have a positive impact on the health and wellbeing of people living with chronic respiratory conditions.

It is a joint policy initiative between the Department of Communications, Climate Action and Environment and the Department of Health and is being delivered by a team comprised of officials from the Sustainable Energy Authority of Ireland (SEAI) and Health Service Executive (HSE). An independent analysis validating and objectively measuring the health and wellbeing impacts is being carried out by the London School of Hygiene and Tropical Medicine, in collaboration with the Health Service Executive.

The scheme is open to people aged 55 and over or aged 12 and under who are living with chronic respiratory conditions in households that are in receipt of certain welfare payments. The scheme works on a referral basis and an approved surveyor identifies which upgrades are most suitable for the home. Improvements include attic and wall insulation, boiler replacement and window and doors replacement where necessary. Appropriate ventilation is also provided in line with retrofitting standards.

In addition to the climate impacts reported above, initial reports have indicated that the upgrades are delivering benefits to the health and wellbeing of participants and if the research confirms this empirically then it will be used to inform future Government decisions about approaches to retrofitting.

The London School of Hygiene and Tropical Medicine has been commissioned to assess the impact of the scheme. The impact indicators being tracked include changes in hospitalisation rates, medication usage, general wellbeing and mental health, social and school absenteeism and overall improvements in quality of life.

The research will analyse these changes using questionnaire and other data gathered from the households and, where possible, by analysing routine data relating to health service contacts. The analysis will also examine the potential to

adapt existing modelling methods to assess the impact of home energy efficiency measures on outcomes that arise over longer time scales than the planned evaluation.

It will also seek to assess how the interventions contribute to reduction in inequalities in outcomes with regard to age, gender and socio-economic status. Researchers will derive an inventory of the health- and environment-related costs and benefits of home energy efficiency interventions as inputs for subsequent cost-benefit analyses.

## Stakeholder Perspective

*Mr and Mrs Smyth, participants in the scheme, have already seen an improvement in their living environment. Rooms are no longer damp with condensation, the house retains more heat leading to reduced fuel bills, and replacement of windows and doors has led to an increased sense of personal security.*

*Mr Smyth who suffers from Chronic Obstructive Pulmonary Disease (COPD), and is on daily medications with frequent hospital admissions, has stated that early signs indicate the symptoms of his COPD appear less severe than previous years*

*The mother of a 10 year child who suffers from asthma that requires treatment with two inhalers twice daily, and averaged two chest infections per year, has expressed delight and satisfaction with the impact of the scheme.*

*Since works have been carried out in the home, the child, who had previously had difficulties playing sports, has shown an improvement in their respiratory illness. The child is now able to train and compete on a soccer team 3 times a week and in competitive matches.*

# Il Tuo Condominio Green

<b>Where is it?</b>	Province of Trento, Italy
<b>Who is it for?</b>	Owners and tenants of multi-family apartment blocks
<b>Impacts</b>	<ul style="list-style-type: none"> <li>• Over 1500 tCO<sub>2</sub> saved as of April 2019.</li> <li>• €5 million public funding, leveraging €30 million of private finance invested in renovations.</li> <li>• (€21 million of which is disbursed through mortgages).</li> </ul>
<b>Dates</b>	2016 to present
<b>Key lessons</b>	<ul style="list-style-type: none"> <li>• Combine financial incentives with technical support for maximum impact.</li> <li>• Tackle systemic barriers collaboratively by convening diverse stakeholders across the renovation value chain.</li> <li>• Programmes take time to mature and the impact they can deliver will increase as they do.</li> <li>• Impact tracking could be improved by creating links between different data sets that are managed by different government agencies.</li> </ul>

Multi-family dwellings and apartment blocks represent a specific set of challenges for renovation. So the Autonomous Province of Trento set out to boost the renovation rates with a scheme combining technical support with economic incentives.

Key barriers that the Province wanted to overcome included:

- The difficulty of decision making - especially where large investments are concerned - due to different expectations of landlords and tenants and people with different backgrounds living in the same building.
- Willingness of building managers to engage - due to increased responsibilities and workload that may not be matched by an adequate return in terms of wage, satisfaction and visibility.
- Challenging relationships with the other professionals involved in the building renovation chain, like technicians and firms that can increase the duration of intervention and investment costs.

The scheme offers financial incentives to support with the costs of interventions. These can be combined with other national incentives and include reimbursement of:

- 90% of design and assistance cost;
- 90% of interest payments on loans or mortgages to cover capital costs of renovations
- 90% of interest payments on commercial loans taken by installers and SMEs carrying out renovation works

Importantly, these incentives are combined with technical support. The Province has convened a cross-sector group of stakeholders with a management board appointed to provide oversight. The group includes SME associations, technicians, apartment managers, and banks involved in the renovation process.

This collaboration is a key element of the initiative in supporting the renovation of private buildings by providing a common approach, tools and materials. The Provincial Board has identified that building managers are a critical stakeholder in the process and so created tailored products to support them such as draft contracts and procedural guidance for decision making by apartment block tenant and owners' groups.

Supplementary training materials were also developed, aimed at developing professional expertise among all actors along the value chain. This was financed through an EU co-funded programme.

To date, over 200 apartment blocks have started a renovation project under the scheme. The Province aims to push for deeper renovations through expanding and improving the type of interventions financed. They also plan to mobilise those professionals who have been trained to act as ambassadors that can promote the programme to building managers and occupants.

Plans are developing to improve impact tracking by integrating or linking data sets such as energy performance certificates and energy consumption data. But achieving this will require another barrier to be overcome; the different data sets are owned and managed by different government agencies.

"Over time, the programme has matured. At the start, only around 10% of enquiries resulted in successful applications but now almost two thirds of assessments are resulting in energy renovations. We're also seeing increased depth of renovations catalysed by the programme. To begin with almost all funding was for improvements to the heating system, and only around 20% also tackled the building envelope. In 2019 the percentages reversed with almost 80% of projects involving insulation or a combination of fabric and system upgrades."

#### Sara Veronesi

Planning and European Projects, Autonomous Province of Trento

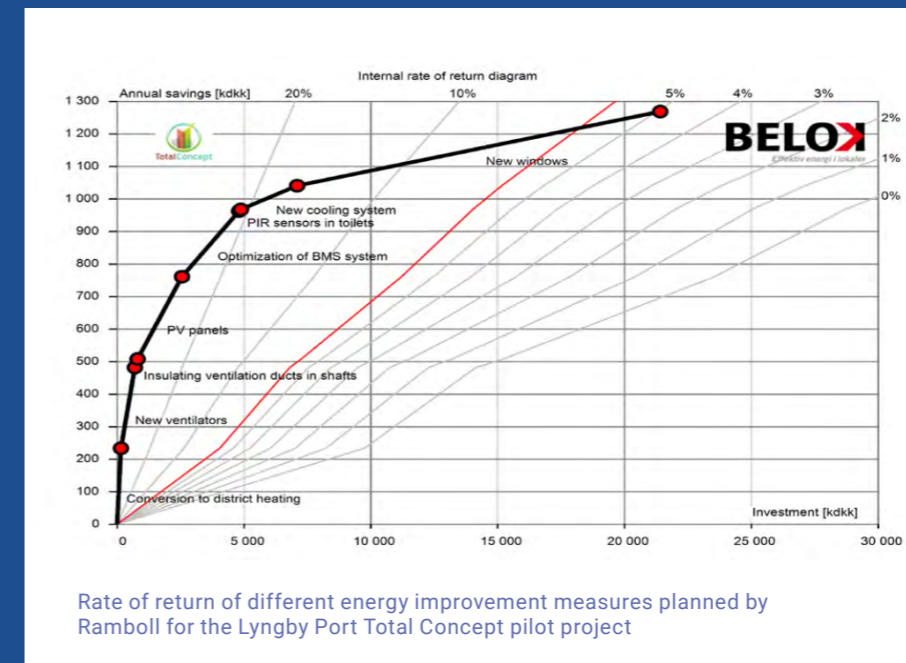
"Actions undertaken locally, in close cooperation with other actors in the energy renovation value chain, are repaying the efforts of the provincial administration. With about €4 million of investments in the form of public support, to date €24 million worth of renovation has been undertaken and €16 million in loans have been granted."

#### Mario Tonina<sup>1</sup>

Vice President & Councilor for the Environment & Urban Planning, Autonomous Province of Trento

# Carbon performance contracting and the 'Total Concept'

Where is it?	Scandinavia
Who is it for?	Commercial buildings and portfolios
Impacts	<ul style="list-style-type: none"> <li>Pilot building renovations have achieved internal rate of return between 4% and 8%.</li> <li>Delivered energy results as low as 90 kWh/m<sup>2</sup>/yr for all users.</li> </ul>
Dates	2014 - present
Key lessons	<ul style="list-style-type: none"> <li>Carbon emissions are a much higher corporate priority than energy.</li> <li>Predicted rates of return may not be enough to trigger investment - a performance guarantee can help clients overcome reluctance to bear risk.</li> <li>A holistic approach to the building means measures with long pay-backs can be packaged with shorter pay-back interventions to make them economically viable.</li> </ul>



The Total Concept initiative<sup>2</sup>, has developed and tested a method and a financial tool for improving energy performance in existing non-residential buildings. By taking a holistic approach to the asset, multiple energy improvement measures can be packaged together. Measures with shorter paybacks are used to support the economic feasibility of those with longer paybacks. Total Concept thus enables a deeper level of energy renovation to be achieved.

Engineering consultancy, Ramboll, led one of the pilot renovations in Lyngby Port, Denmark. The figure above shows each of the measures (1-8) proposed for the project. The measures are ranked with respect to the payback time or rate of return. With the graph it is possible to visually evaluate the combined payback time when an extra measure is added.

After finding that clients are still reluctant to take on the investment and risk of a major renovation, Ramboll have since developed the

approach to tackle these barriers to renovation in the commercial sector. They are pioneering a carbon performance guarantee. Energy performance contracting is relatively common in certain sectors. But Ramboll have found that carbon emissions have become a much higher priority for companies, making a carbon performance guarantee a more compelling offer.

Ramboll use the BMS to gather daily performance data on the energy consumption, equipment status and environmental conditions within the building. They interrogate this data to enable proactive, data-driven operation and maintenance, which in turn makes the carbon performance guarantee possible to achieve.

In addition to removing risk, Ramboll has partnered with Enerfin to be able to provide clients with a tailored financing offer. Enerfin, in turn, are able to aggregate projects into larger portfolios to make them more attractive to large investors.



"We found that when you talk about energy efficiency, you are communicating with the facility manager, who has limited strategic decision power. But when you talk about carbon savings, you have the attention of top management in a company. Carbon is a strategic issue for senior executives."

**Nikolaj Haaning**  
Head of Commissioning, Indoor Climate and Sustainability, Ramboll Denmark

"We need methods that guarantee that investments in energy saving measures provide the intended energy and CO<sub>2</sub> reductions. Smart use of our energy reduces operational costs and helps reduce the CO<sub>2</sub> footprint for our buildings."

**Bjarne Dalgaard**  
Technical consultant

Bygningsstyrelsen

(Danish buildings and property agency - Ramboll client)

# Section two

**The Wave will be driven  
by leaders and scale by  
regulating laggards**

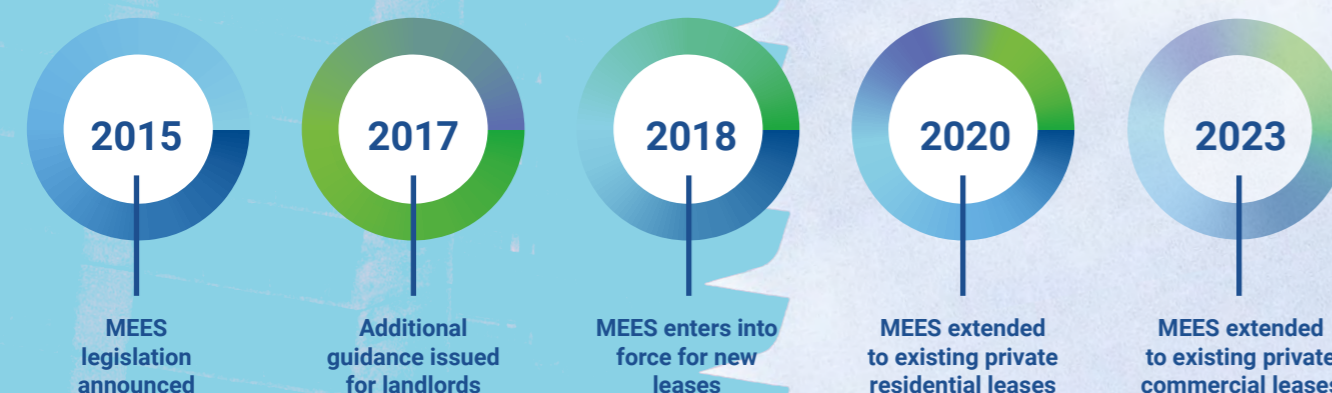
Mandatory minimum energy performance requirements have the potential to significantly drive up building performance and examples in the Netherlands and UK have been heralded as leading examples of Government action on poor performing existing buildings. Due to their relatively recent introduction, official statistics on impact are not available. So for this report, WorldGBC Europe conducted interviews with a series of stakeholders working across the commercial and residential sectors - banks, municipalities and property agents - who have been affected by the legislation.

The actions they have taken in response to the legislation allow us to gauge how it is affecting the market. This provides valuable insights into the strengths and weaknesses of the legislation and to draw out lessons for other policy makers considering similar approaches. This section tells the story of the impact of approaches in the UK and Netherlands.

# UK Minimum Energy Efficiency Standards

Where is it?	England and Wales (Scotland and Northern Ireland have devolved powers)
Who is it for?	Private landlords of commercial and domestic property
Impacts	<ul style="list-style-type: none"> <li>• Renting out F or G EPC-rated properties is now illegal.</li> <li>• No official impact data yet available.</li> </ul>
Dates	Phased enforcement from 2018 (see timeline below)
Key lessons	<ul style="list-style-type: none"> <li>• Providing a phased introduction allows market actors time to prepare and may improve compliance.</li> <li>• The compliance instrument (here the EPC) has a major impact on effectiveness and poor assessment tools will undermine the effectiveness of the legislation.</li> <li>• With low enforcement, the main driver of compliance is corporate ESG performance, hence the interplay with market ratings or league tables is an important consideration.</li> </ul>

UK MEES legislation requires privately rented commercial and residential properties to have an E-rated energy performance certificate (EPC) or higher. This was announced in 2015 and had a phased introduction from 2018 onwards, as shown in the timeline below:



The obligation to comply with MEES lies with landlords and applies at the point the lease is signed. A range of exemptions are available (for example for historic buildings or temporary leases) and the maximum amount a landlord is obliged to pay to upgrade their property is limited by a 7-year payback threshold or a £3,500 limit for domestic property. An overview of all the details of the policy can be found in Filling the policy gap: [Minimum Energy Efficiency Standards \(MEES\): one year on: A Progress Report](#) ➔

In the property sector, MEES is seen as having been instrumental in raising awareness of energy performance at a senior leadership level. The degree of engagement with government about the regulations is also seen as having been relatively high.

The relatively long lead-in that was built into the MEES timetable meant that proactive market actors had time to plan and prepare. Moreover, recent government consultation on the future of the policy have apparently already prompted action amongst the most pro-active in the sector who are now preparing for tighter regulations, despite these only being proposed for introduction in 2030.

However, enforcement is seen as a major weakness. It is thought that some 15-20% of properties are not compliant with the thresholds and a significant minority would likely qualify for an exemption from the need to comply. Yet when CBRE checked the data for London in early 2020, they found only 15 exemptions had been logged in the capital. They concluded that there could be tens of thousands of properties where no action has been taken by the owner and no enforcement. A 2019 study by the Estates Gazette<sup>3</sup> found there had been no prosecutions for non-compliance within the first 12 months of MEES applying to residential properties.

There are also criticisms of the calculation tool used to generate EPCs. For example, lighting upgrades and heating system controls can have a more significant influence on the EPC result than fabric upgrades. This fact, coupled with the relatively low threshold of E-rating means MEES may be failing to achieve the crucial 'fabric first' approach to building renovations.

<sup>3</sup>Estates Gazette, 2019, MEES one year on ➔



"Of the several thousand properties and transactions that we've been involved in, we've only lodged two exemptions, which is because either we were able to improve the rating by accurately modelling the property and/or by our clients carrying out cost-effective improvements to secure a compliant rating. However, with the *continue-to-let* provisions kicking in for non-domestic property in 2023 and if the minimum standard tightens to a B in 2030, then I expect it will become more challenging to meet the standard and therefore, expect there to be an increase in the number of exemptions. The future trajectory of MEES is very much on our clients' radar with the acceptance that the minimum standard is likely to move to a B within the next 10 years."



"ESG has brought MEES sharply into focus for our clients. There is now an impetus to achieve and extend beyond compliance in order to de-risk assets and portfolios. There are however deficiencies with the metric that is used to measure energy efficiency of buildings. It is our opinion within CBRE that in order to achieve our net zero ambitions an operational energy component is essential in the MEES regulations. This will encourage design for performance rather than compliance."

**Chris Peirce**  
Associate Director  
- Environmental  
Consultancy, CBRE

**Mat Lown**  
Partner, TFT

# Dutch Voluntary Agreements and Minimum Energy Performance Standards

Where is it?	Netherlands
Who is it for?	Social housing, Offices over 100m²
Impacts	<ul style="list-style-type: none"><li>• Social housing average Energy Index score gone from 1.86 in 2015 to 1.57 in 2019. Target B Energy Label is a score of 1.4.</li><li>• Major Dutch banks have stopped financing poor performing commercial properties.</li><li>• Estimated less than half of Dutch offices comply with 2023 C label targets, but leaders like ING have reached +80% portfolio compliance.</li></ul>
Dates	Voluntary agreements with social housing sector in place since 2012. Offices legislation since 2018.
Key lessons	<ul style="list-style-type: none"><li>• Voluntary agreements across sub-sectors (offices, social housing) are paving the way for minimum energy performance standards.</li><li>• Regulations are closely co-designed with industry. Dutch banks played a pivotal role in encouraging office owners to renovate (the carrot) alongside the new regulations (the stick).</li><li>• Dutch social housing sector association Aedes enables monitoring, evaluation and learning on implementation of minimum energy performance agreements. This centralises cost and knowhow effectively.</li></ul>

The Netherlands is one of the few countries to have introduced minimum average energy performance standards for existing buildings. A voluntary agreement (the “Energie Akkoord”) is in place between all social housing providers and the government, to bring their rental housing up to a class B Energy Label by 2021. Additionally, from 2023 offices will be required by law to have a minimum C level Energy Label. The Dutch Government has also set out its further intention that by 2030 all office buildings will have achieved an A label.

Whilst only anecdotal impact data for the offices sector is available due to the scheme date, the social housing sector has invested in significant impact tracking and learning for some years. Each social housing provider is establishing a roadmap towards a CO<sub>2</sub>-neutral stock by 2050, and housing corporations are working to accelerate measures across the sector such as working with cities to develop regional energy strategies. Aedes, the Dutch social housing sector association, monitors energy improvements alongside other performance metrics across the social housing stock through its Shaere Database [↗](#). Data is collected against the progress of each individual housing provider, and average Energy Index Scores are aggregated and tracked in the database. CO<sub>2</sub> performance data for the sector lags a couple of years behind due to availability, but this is also tracked. Having the voluntary agreements in place and systematic sector wide knowledge sharing has been key to quickly solving the knowledge gap of how to reach target performance levels.

Actors in the Dutch offices sector also tell a story of the market leading the way, with policy then increasing the number of office owners moving towards energy renovation. It is clear there must be a positive market pull and market incentives towards minimum standards to enable minimum standards policy. A ‘pull’ by major Dutch banks such as ABN AMRO, ING and Rabobank played a pivotal role shaping the new offices legislation. Because banks included this in their policies, clients were already used to this sort of requirement ahead of the legislation, and all

three banks have said they will no longer finance properties rated D or below. Market offerings such as ING’s ‘5 Step Plan’ [↗](#) offer significant owner incentives, such as 100% financing for energy upgrades, interest discounts, subsidy advice and free EPC labels when you jump to a C, B or A.

There is now a high level of cooperation between the government and market actors around what the evolving offices standards should look like on the path to the Netherland’s 2030 national target of 49%.



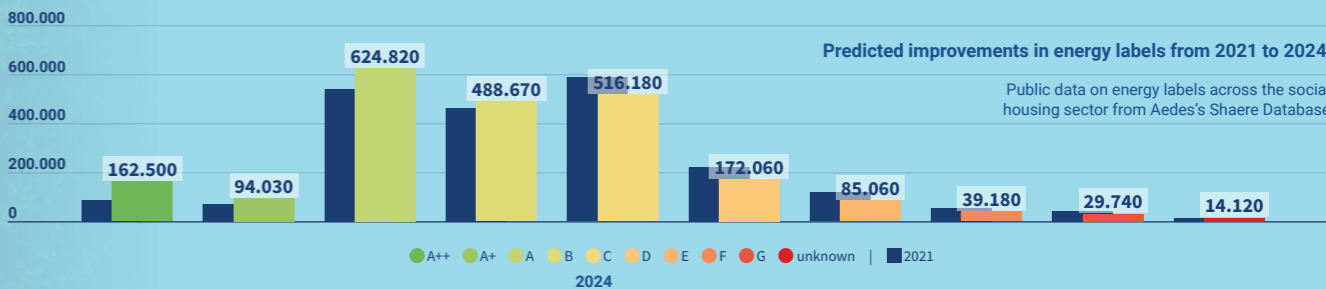
“Monitoring, learning and evaluation can be costly, but we use the data to get the social housing organisations together to learn from one another - and this never gets old! It’s hugely valuable to accelerating progress across the sector. We are outsourcing a lot of the monitoring work to expert companies, and our benchmark data now goes beyond aspects like operating costs and energy use, to include the happiness and wellbeing of tenants.”

**Christiane Hogeweg**  
Aedes



“If we are going to wait for legislation it will be more for laggards than early adopters. Quality and value correlates directly with high levels of sustainability, so from our own policy and risk perspective we see it is lower risk for us to finance these buildings.”

**Hein Wegdam**  
Director Sustainable and Innovative Real Estate Products, ING Real Estate Finance



# Section three

**The Wave needs systemic  
yet simple approaches to  
tracking impact**

To overcome Europe's renovation challenge, we need robust impact metrics that are meaningful and easy to track. Without this data we have no way to identify which actions are most effective.

By collecting impact data in a consistent manner we can quickly identify and scale those initiatives that are generating the most desirable climate, health and economic outcomes. Impact indicators should aid fast learning and adaptation, highlight the interactions between different renovation initiatives and help identify the approach most suitable for a given location.

BUILD UPON<sup>2</sup> addresses this issue by building a renovation strategy impact framework that serves as a tool to navigate the complex landscape of programmes and projects and to help policy makers at city, national and European level to really see what works and what does not.

# Helsinki Climate Watch and ‘Energy Renaissance’

Where is it?	Helsinki, Finland
Who is it for?	Entire city
Impacts	<ul style="list-style-type: none"><li>Initiative starting in 2020/21 so no impact data.</li><li>Research into root causes of inertia for energy renovation.</li><li>Set up of city funded expert engineering advice service for block renovations, with simple progress indicators.</li><li>Establishment of Helsinki Climate Watch as system of impact indicators to track overall city decarbonisation progress.</li></ul>
Dates	Forthcoming
Key lessons	<ul style="list-style-type: none"><li>Tackle real root causes not assumed barriers to renovation.</li><li>Establish a systemic understanding of how city decarbonisation initiatives impact one another.</li><li>Establish simple impact indicators that enable fast learning, problem identification, and responsive redesign of renovation initiatives.</li><li>Even three simple indicators per initiative, when scaled across a city-wide system of +100 initiatives can become impossible to track. Simple impact frameworks are needed.</li></ul>



Example of Helsinki’s different levels of impact indicators

Helsinki has one of the world’s most ambitious climate policies: for the city to be carbon neutral by 2035 [↗](#). It also has one of the most sophisticated understandings of how the 147 initiatives in its 2035 city action plan inter-relate, with a [detailed systems map](#) [↗](#) guiding its interventions.

From this Helsinki has developed [Helsinki Climate Watch](#) [↗](#), a unique tool for monitoring the effectiveness of these initiatives - with a system of progress indicators that provide transparency for citizens on the progress of individual initiatives and the whole action plan. The indicators are grouped into three levels. Firstly ‘functional’ indicators, directly linked to progress of specific initiatives. Secondly, ‘tactical’ indicators looking at how effective initiatives are in the context of sectoral initiatives (like buildings). Thirdly, ‘strategic’ indicators to understand how an initiative connects to the big emissions picture and its overall effectiveness in driving emissions down.

56% of the city’s emissions are generated by heating, and a 30% cut of district heating consumption in the next 15 years is needed to achieve the city’s 2035 targets, so building energy efficiency is key. Most buildings in Helsinki are owned by limited companies that residents hold shares in, and deep energy renovations rarely happen when these are being modernised by the ‘boards’ of private owners.

Research identified the key barriers as an insufficient level of knowledge within these boards, and whilst lots of information on energy renovation is available, it comes from multiple sources and isn’t trusted.

To solve this the city’s ‘Energy Renaissance’ programme [↗](#) aims to help renovate 500 apartments each year by offering them ‘engineering power’: paying for qualified engineers to knock on doors when renovations are planned, undertake thorough energy assessments, suggest appropriate measures, then ask the right questions and evaluate renovation offers from the private sector. The goal is to ensure a smooth process for property owners, and eventually harness the power of the private sector to provide a more integrated ‘one-stop-shop’ style renovation service. City planning is also being engaged to identify multiple concurrent projects to achieve efficiencies of scale, and identify where profits from boards developing new buildings on their land could be reinvested in renovating their existing buildings.

The Energy Renaissance programme has simple progress tracking indicators aimed at identifying and fixing problems:

1. Number of apartment buildings contacted. This measures whether the city engineers are doing their job. The preliminary target is 100 contacted buildings per person per year.
2. Number of apartment buildings starting to plan for energy renovations. If a city engineer has contacted 100 apartments and only 2 have started to plan for an energy renovation, the communication process is ineffective and needs redesign. If 50 have started, it’s working effectively.
3. Energy efficiency increase: Changes to E-values or percentage energy use improvements are tracked. So if engineers have contacted 100 buildings - 50 have started renovating - but E-values are only going down marginally, then the planning process needs to be redesigned to enable deeper savings.



“We don’t want to renovate home by home: we need a mass movement if we are going to make our climate targets. Our main task is to fail fast - learn - adapt and try again. We are using [Climate Watch](#) [↗](#) to enable this learning. It is ideal to have our three levels of impact indicator for all initiatives, but whilst there is a need for more systemic thinking and impact tracking at city level, there is also a limit to what is feasible.”

**Kaisa-Reeta Koskinen**  
Director, Carbon Neutral Helsinki

# BUILD UPON<sup>2</sup> renovation strategy impact framework

<b>Where is it?</b>	Pan-European: 8 pilot cities (Budaörs - Hungary, Dublin - Ireland, Eskişehir - Turkey, Leeds - UK, Padova - Italy, Valladolid - Spain, Velika Gorica - Croatia, and Wrocław - Poland).
<b>Who is it for?</b>	Cities looking to track impacts of renovation strategy/initiatives
<b>Impacts</b>	<ul style="list-style-type: none"> <li>Tracks impacts across 3 core areas             <ul style="list-style-type: none"> <li><b>Environment:</b> emissions reduction, energy efficiency improvements, annual renovation rate and increased renewable energy.</li> <li><b>Social:</b> - energy poverty, indoor air quality, thermal comfort and citizen engagement.</li> <li><b>Economic:</b> Investment in renovation and jobs created.</li> </ul> </li> <li>Allows cities to identify best practice, and to make a better business case for energy renovation.</li> <li>Inform energy renovation policy making.</li> </ul>
<b>Dates</b>	Forthcoming - Framework to be piloted by 8 European cities (July - December 2020) and to be launched in 2021.
<b>Key lessons</b>	<ul style="list-style-type: none"> <li>Lack of data and lack of resources to collect data is an issue for all cities involved in the project. Need to develop simple and transparent methodology to support cities in that process.</li> <li>Start small with simple, meaningful and easy to use indicators. The Framework can be further developed at a later stage.</li> <li>Involve various departments in the process to support cross-departmental cooperation and achieve better results.</li> </ul>

Across Europe, 8 cities are working with their local Green Building Council, national government and industry to develop and pilot a 'multi-level renovation impact framework'.

This framework will serve as a tool to build the capacity of local actors to focus on real impact and learning, enabling cities to track and monitor holistically the impact of energy renovation on key issues such as emissions reductions, employment and improved health.

By capturing data at a local level, the framework will link renovation to policy and decision making processes at a national level, driving greater investment in city regeneration programmes.

The framework is composed of 'core' and non core indicators. Core indicators must be used by all municipalities and/or central governments using the framework and non-core indicators may be used on a voluntary basis. All these indicators are linked to economic, social and environmental priorities at national and EU level.

In the future, the framework will be used as a blueprint for the implementation of the Energy Performance of Buildings Directive (EPBD), and by cities signed up to the Covenant of Mayors in their efforts to tackle the decarbonisation of their building stock, as well as for governments worldwide looking for guidance in their national building strategies

# BUILD UPON<sup>2</sup> renovation strategy impact framework

CATEGORY	GOAL Contribute to EU Targets	NATIONAL Progress Indicators	MUNICIPAL Progress Indicators	Unit of Measure
Environmental	Greenhouse gas emission reduction: 50% by 2030 compared with 1990 level and carbon neutrality by 2050	Reduction in direct annual CO2 emissions from <b>renovation</b> compared to 1990 levels	Reduction in direct annual CO2 emissions from <b>renovation</b> compared to the municipality's baseline year as per CoM reporting	> Ton CO2/ year (total building stock) > Breakdown by building type from total number (%)
Environmental	At least 32.5% improvement in energy efficiency by 2030 - relative to the 2007 modelling projections for 2030.	Final energy consumption reduction from renovation	Final energy consumption reduction from renovation	kWh/m <sup>2</sup> /year
		Improvement of <b>Net Space Heating &amp; Cooling Demand</b> due to energy <b>renovation</b>	Improvement of <b>Net Space Heating &amp; Cooling Demand</b> due to energy <b>renovation</b>	> kWh/m <sup>2</sup> /yr (total building stock) > kWh/m <sup>2</sup> /yr (for each building type)
		Annual energy <b>renovation rate</b> %	Total annual energy <b>renovation rate</b> % > Of which <b>light renovation</b> > of which <b>medium renovation</b> > of which <b>deep renovation</b>	% based on dwellings % based on sq. m <sup>2</sup> renovated - Non-domestic buildings
		% of renovated buildings reaching <b>nZEB standard</b> annually	% of renovated buildings reaching <b>nZEB standard</b> annually	% renovated buildings
		% of the total floor area of buildings owned and occupied by central government retrofitted each year	% of the total floor area of buildings owned and occupied by the municipality retrofitted each year	% of total m <sup>2</sup> net floor area
Environmental	At least 32% share of <b>renewable energy</b> by 2030	Total additional energy produced from <b>renewable resources on site or nearby</b> as a result of renovation	Total additional energy produced from <b>renewable resources on site or nearby</b> as a result of <b>renovation</b>	kWh/year
Social	Reduction of <b>energy poverty</b>	% of households having arrears on utility bills	% of households having arrears on utility bills	% of households
Social	Provide safe buildings to people - <b>Indoor Air Quality</b> and <b>Thermal Comfort</b>	Actions to improve <b>indoor air quality</b> post <b>renovation</b> works	# households living in renovated dwellings with commissioned ventilation system	# households
			# non-residential renovated buildings with a commissioned ventilation system	# buildings
		Actions to improve average <b>thermal comfort</b> post renovation works	# households living in renovated dwellings where calculations demonstrate that post renovation condition will satisfy heating requirements	# households
			# households living in renovated dwellings where actions have been taken to minimise summer overheating risk	# households
			# non-residential renovated buildings where calculations demonstrate that post renovation condition will satisfy heating requirements	# non-residential buildings
			# non-residential renovated buildings where actions have been taken to minimise summer overheating risk	# non-residential buildings
Social	Empowering citizens - Ensuring citizens are at the centre of the transition	# private households retrofitting their homes / year # sq. m <sup>2</sup> commercial buildings retrofitted annually	# private households retrofitting their homes / year # sq. m <sup>2</sup> commercial buildings retrofitted annually	# private households # buildings
Economic	Increasing investment in energy renovation	> Total annual investment in energy renovation > Total annual public investment in energy renovation > Total annual private investment in energy renovation	> Total annual investment in energy renovation > Total annual public investment in energy renovation > Total annual private investment in energy renovation	€
Economic	At least 32.5% improvement in energy efficiency by 2030 - relative to the 2007 modelling projections for 2030.	# companies involved in energy renovation	# companies involved in energy renovation	# companies
		# graduates from 3rd level courses and technical training courses with focus on energy renovation	# graduates from 3rd level courses and technical training courses with focus on energy renovation	# graduates
		# building professionals and construction workers taking part in energy renovation upskilling > of which #Public sector staff upskilling in energy renovation	# building professionals and construction workers taking part in energy renovation upskilling > of which # Municipality staff upskilling in energy renovation	# building professionals and construction workers

# Section four

**The Wave needs to  
convene people through  
platforms that multiply  
impact and learning**

Under the Green Deal, the EU has highlighted the role of renovation platforms in bringing together the buildings and construction sector, architects and engineers and local authorities to address the barriers to renovation.

Stakeholder platforms enable representatives from diverse organisations and interest groups to come together to discuss shared challenges, opportunities, policy actions and advocacy strategies. These platforms have a key role to play in helping drive scale in complex systems transitions.

# BUILD UPON, Ireland

## Where is it?

Across Ireland

## Who is it for?

All stakeholders involved in the renovation challenge

## Impacts

- 200 stakeholders actively involved in the participatory process.
- 135 stakeholders fully endorsed outcomes/recommendations, many of which went on to be adopted by government policy.
- 8 new collaborative cross-sector initiatives have spun out of the stakeholder platform.

## Dates

2015-17 originally (continuing in different form)

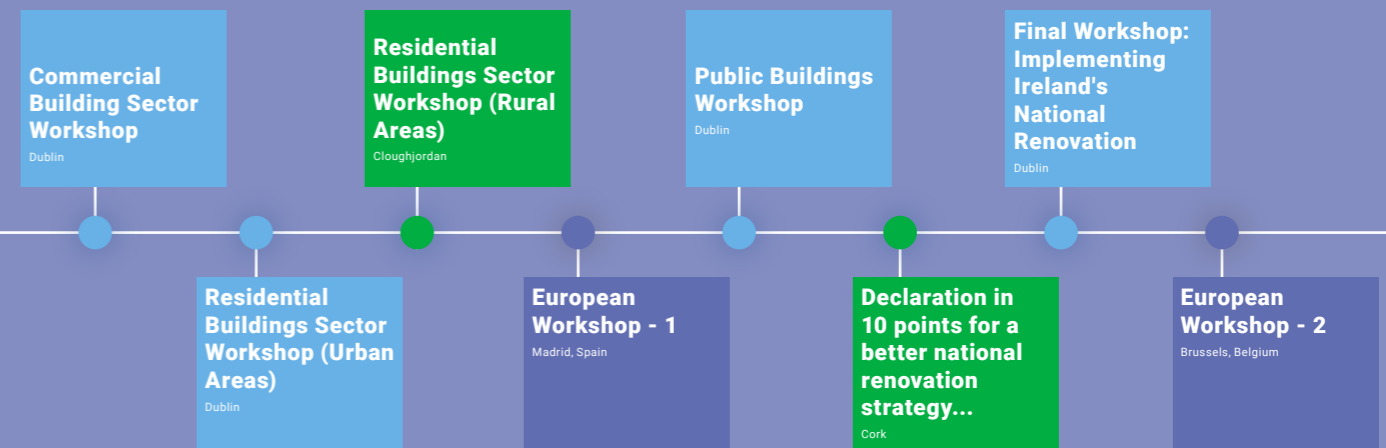
## Key lessons

- By moving away from traditional consultation and focusing on community, stakeholders feel a sense of ownership and more motivated to find solutions.
- Working in partnership with governments builds trust and a shared sense of purpose
- Stakeholder engagement is a continuous process, and they must be involved not only in design but in implementation.

## Putting Real Impact First

During the first phase of the BUILD UPON project, a uniquely diverse community of nearly 2,000 organisations were brought together at over 100 events across Europe, to co-create the national building renovation strategies required by EU law.

As part of this, the Irish Green Building Council brought together a community of close to 200 organisations at 14 connected events to co-design Ireland's national renovation strategy. The core series of events aimed to convene stakeholders at national level for policy formulation, city level to create local solution networks, and European level to engage with other markets and share solutions.



The stakeholder platform was established by the Irish GBC and co-led by a series of 'Change Leaders' ➡, each representing one of the diverse stakeholder groups identified in BUILD UPON's Irish stakeholder map ➡.

The events were structured around cutting edge participatory techniques for co-creating solutions, and as they progressed the impact of these techniques was tracked.

Engaging a diverse group of stakeholders in the process facilitated a sense of community and provided stakeholders with ownership of the problem. This and acknowledgement of progress made as a group, galvanised the community and created a sense of momentum to find impactful solutions to shared challenges.



# Programma Aardgasvrije Wijken: Gas Free Districts Programme

<b>Where is it?</b>	Netherlands
<b>Who is it for?</b>	Municipalities piloting district approaches to renovation and energy transition programmes to eliminate natural gas heating
<b>Impacts</b>	<ul style="list-style-type: none"> <li>• 27 pilot programmes launched in districts across the Netherlands</li> <li>• Target of 100 pilots launched by 2028</li> <li>• 27,000 stakeholders convened in an online knowledge and learning platform</li> <li>• Lessons learned are influencing hundred of other municipalities, shaping national policy making and informing other European initiatives and platforms</li> </ul>
<b>Dates</b>	2018 - present
<b>Key lessons</b>	<ul style="list-style-type: none"> <li>• Collaborate at every level - convening stakeholders at national, municipal and local level around common objectives creates the strongest synergies</li> <li>• Map the stakeholders - at local level, it is critical to map and work with a range of representative groups and entities<sup>[FA1]</sup></li> <li>• Developing a diligent, successful district approach, that incorporates the interests of residents and building owners, takes time: allow for that time and stimulate learning processes.</li> </ul>

Image credit: Kick Smeets

The Programma Aardgasvrije Wijken (PAW) is an intergovernmental programme that brings together national ministries and local authorities to support communities to achieve the Netherlands 2050 commitment to become 'natural gas free'.

The initiative aims to foster learning around how a district approach to the natural-gas free transition can be structured and scaled up, through a series of local, municipality-led pilots. The municipalities receive, on average, €4 million to cover the investment gap for unprofitable parts of the programme.

The municipality coordinates the pilot project, but always works closely together with local stakeholders including residents, energy suppliers, network operators and housing corporations. Local residents are engaged both through formal structures such as residents' associations and through informal social connections. Most of this is done through in person meetings and events.

The PAW programme is structured thematically and each theme has a manager who, for example commissions research, organises meetings and events as well as providing an online forum for conversations about bottlenecks, questions or solutions. The programme has built an online community that now boasts 27,000 users.

The PAW programme also has a Knowledge and Learning Platform (KLP). In this knowledge programme, the experience and lessons of the different pilot projects are shared with all Dutch municipalities. The KLP has three goals:

**Raising awareness** among all municipalities about their role in the natural-gas free transition of the built environment and the district-oriented approach.

**Knowledge development** and expertise building through for example master classes and Communities of Practice.

**Signaling** bottlenecks and addressing them where possible.

Based on the practical experiences of the pilots to date, the PAW programme identifies key principles for participation which can be applied more widely to similar stakeholder platforms, these include:

- **Policy choices** - to secure adequate national and municipal support it is key to identify existing policy initiatives that the platform and programme can support
- **Internal (municipal) organisation** - success requires a different, less siloed, way of working across national and municipal government departments
- **Working together democratically** - the democratic quality of processes contributes to legitimacy, but also to the support of policy and results.
- **Stakeholder mapping** - large scale transitions like this require long-lasting, well-functioning collaborations between all stakeholders; from municipalities, to network operators, to residents' groups or energy cooperatives, to heat suppliers. It is critical to map and invest time in relationships between all these actors.

# Work with us!

As 2020 is the start of the decade of climate action, we are inviting all cities, states, regions and companies to work with us on solutions in the building sector.

The BUILD UPON² project is welcoming cities to join our work on renovation strategies, and would love to hear more about impactful renovation initiatives you are running in your city - which we can put on the European stage.

The pilot cities we are working with are: Velika Gorica, Croatia - Budaörs, Hungary - Dublin, Ireland - Padova, Italy - Wroclaw, Poland - Valladolid, Spain - Eskişehir, Turkey - Leeds, UK

We are calling on leaders across the public and private sector to join the [Net Zero Carbon Buildings Commitment](#)  ahead of COP26 - to really make Europe's renovation wave a reality.

Read more about the project and get in touch with the team via the links and details below.



**Email** [europe@worldgbc.org](mailto:europe@worldgbc.org)

**Web** [www.worldgbc.org/build-upon](http://www.worldgbc.org/build-upon)

**Twitter** [@WorldGBC\\_Europe](https://twitter.com/WorldGBC_Europe) [#BUILDUPON](https://twitter.com/WorldGBC_Europe)



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