



FINAL RECOMMENDATIONS FEBRUARY 2017

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Members of the advisory board and workshop participants are listed pages 22 and 23 respectively.

INTRODUCTION

Building-related emissions will play a critical role in achieving the goal stated by the Paris agreement to remain between 1.5 and 2 degrees above the preindustrial level. In Europe, a long-term objective of decreasing the CO2-emission levels for the building sector by 88%-91% in 2050 compared to 1990 levels was established in 2011. While all new buildings must be nearly zero-energy buildings (NZEB) by 2020, the long life of building sector assets means Member States must tackle the existing building stock by an increased rate of deep energy renovation.

Recognising this, Article 4 of the Energy Efficiency Directive requires Member States to define long-term strategies for stimulating energy efficiency renovation of the building sector. This was done for the first time in April 2014, with strengthened strategies to be delivered every 3 years thereafter. The Department of Communications, Climate Action & Environment (DCCAE) is responsible for producing an updated version of Ireland's national renovation strategy by 30 April 2017.

National building renovation roadmaps provide an opportunity to develop strategies that not only reduce energy consumed by buildings but also address other issues such as climate change, fuel poverty, citizens' health and wellbeing as well as economic growth and job creation.

Against this background, the IGBC, in conjunction with DCCAE, organised a comprehensive consultation process (p.21) involving close to 200 key stakeholders (p.23) from April 2016 to February 2017.

This document presents our final set of recommendations for a better National Renovation Strategy V.2.

MINISTERIAL FOREWORD



Climate change is one of the greatest challenges we face as a society. Ireland still relies on high emission, imported fossil fuels to meet over 88% of our energy needs. This costs us around €4.6 billion every year. We cannot allow this to continue.

I will shortly publish Ireland's first National Climate Mitigation Plan which will set out the measures already underway and those that are planned to reduce our carbon emissions and make our society sustainable.

Energy efficiency will be central to this plan. This is because using less energy and using it more efficiently is the most cost-effective and accessible way to tackle climate change. If we use less energy it makes it easier to replace our fossil fuels with renewable energy. If we use our energy more flexibly it makes it easier to integrate different types of renewable energy into our energy system.

Already, energy efficiency grant schemes have supported more than 300,000 home upgrades. Energy efficiency has also reduced the public sector's energy bill by more than a fifth and it has supported the construction industry through some of the most challenging times the country has ever faced. These achievements are only the beginning of our ambition.

In short, we need policies that can support more people to invest in an energy efficiency upgrade to their home or business.

To achieve this Government policy needs to be realistic, collaborative and citizen-led. The work of the Irish Green Building Council that developed the recommendations in this report is a tangible example of this new kind of policy development.

Through its drive and commitment the Council successfully brought together a wide range of diverse stakeholders to identify and propose solutions to the challenges and opportunities we face in upgrading our homes and businesses. This document represents the collective wisdom of this process and its conclusions will be pivotal to the creation of Ireland's climate and energy plans and the next version of the National Renovation Strategy.

Denis Naughten TD,

Minister for Communications, Climate Action and Environment.

IGBC CHAIR'S FOREWORD



Upgrading our homes so that they use less energy is one of the most cost-effective ways to reduce Ireland's greenhouse-gas emissions. Building renovation also has several side effects, often yielding substantial benefits –environmental, economic and social. These co-benefits can accrue to the building users (e.g. increased comfort and better health) but also to society (e.g. job creation and energy security).

As chair of the IGBC, I was involved in the consultation process which led to the publication of Ireland's first National Renovation Strategy in 2014. I clearly remember the small workshop organised in Dublin Castle in January of that year; and I am proud of our journey since that date. Close to 200 key stakeholders from a broad range of backgrounds have worked together for over a year to put together this comprehensive set of recommendations for a better national renovation strategy.

Progress has been made in accelerating energy efficiency in Ireland. For instance, SEAI's most recent annual report on the performance of public bodies showed that the public sector avoided €154 million spend through improved energy efficiency in 2015.

Of course, far more needs to be done if we are to reach our 2050 vision: "A fully decarbonised built environment that delivers a better quality of life for all". However, I am confident that solid foundations are in place, or to borrow the tree metaphor used throughout this document, that we have developed a strong root system below the surface.

I would like to extend my thanks to the Department of Communications, Climate Action and Environment, to Marion Jammet, Pat Barry and the IGBC team, and to the almost 200 stakeholders who have been involved in this innovative process. I believe that all these stakeholders have a significant role to play in making large scale deep renovation a reality in Ireland, and I look forward to seeing more cross-pollination of ideas –and lots more action.

Prof. J Owen Lewis Chair, Irish Green Building Council

EXECUTIVE SUMMARY

As Ireland's emissions across the transport and agriculture sectors are set to continue to increase over coming years, building-related emissions will play a critical role if we are to achieve the goal stated by the Paris agreement to remain between 1.5 and 2 degrees above the preindustrial level. Significant progress have been made over the last decades. E.g. the introduction of efficiency requirements in national building codes in Europe from the 1970's onwards mean new buildings today consume only half as much energy as typical buildings from the 1980's.

Yet, larger and quicker steps must be taken in relation to energy renovation if Ireland is to reach its climate targets. The key messages in this report are:



Beyond climate targets, large-scale deep renovation can have a positive impact on job creation and a myriad of social benefits. An integrated cross-departmental approach is thus needed to develop and implement an ambitious national renovation strategy.

Furthermore, retrofitting Ireland's building stock requires a comprehensive national framework that connects national and local initiatives and better support for crosssector engagement.



A stable and long-term framework is required to provide all players with certainty and generate confidence.

The Paris agreement and EU targets provide some predictability. Yet, the role of national and local targets should not be underestimated. The introduction of targets and interim performance targets for each building type (commercial, residential and public) is recommended. In order to better connect with local communities, these should be complemented by localised targets.

Targets and interim targets would also allow for transparent and regular tracking of progress.



INVEST IN DEEP ENERGY RENOVATION NOW

As it currently stands, Ireland is likely to be fined for not reaching its binding 2020 climate/energy targets. Instead of paying substantial fines in 2021, it is advised to invest money in deep renovation now.

Certainty and predictability should contribute to a higher level of investment in this sector. While there is a strong business case for the private sector to pursue deep energy renovation, legislative changes and financial incentives such as grants and tax incentives could accelerate market transformations.

In particular, the aggregation of projects should be supported as a way to lower costs, improve quality and facilitate access to funding.

Funding mechanisms should better support deep energy retrofit, including phased deep retrofits. This could potentially be achieved through more composite grants for homeowners and landlords, and multi-annual funding agreements under schemes such as the Better Energy Programmes. The extension of the Accelerated Capital Allowance (ACA) to retrofitting solutions, the inclusion of private landlords renovating rented accommodations, should also be considered.

While targeted and effective government incentives could be part of the solution, the scale of the challenge means that private investment will also need to be mobilised. For this reason, the introduction of green mortgages and building performance leases should be encouraged.

MAKE DEEP ENERGY RENOVATION DESIRABLE

Deep retrofit awareness, and more specifically awareness of specific interventions and deep renovation co-benefits, remain low at all levels of Irish society.

A comprehensive communication plan that leverages every channel to make more energy efficient buildings an assumed and aspired standard is required.

More specifically, coordinated awareness raising campaigns are needed at both national and local levels. Nevertheless, simple financial messages around energy bill savings are not appropriate for all end-users. In fact, multiple messages, strategies and routes to engagement should be used to better target various segments of society.

To achieve the highest impact, a combined top-down and bottom-up approach is suggested. Government leadership and clear political commitment are required. As highlighted in several pieces of legislation, the public sector must also play an exemplar role in promoting deep energy renovation. Yet, the power of community-based approaches and local champions should not be underestimated – People tend to trust their neighbourhoods and local communities more.



5 FACILITATE DEEP ENERGY RENOVATION

Quality energy upgrades must be made more convenient and accessible.

In practise this could be achieved through the publication of clear, comprehensive information and guidance, including high quality case studies, Publicly Available Specifications and Technical Guidance Documents for historic buildings based on research and industry engagement.

The development of common templates for evaluating energy renovation projects using a triple bottom line approach (i.e. quantifying environmental, social and economic impacts) would also be useful.

These actions should be complemented by the introduction of simple holistic energy assessment and /or building passports which would include a masterplan for retrofit and a record of works.

Residential end users and SMEs would also benefit from the development of a network of skilled, trusted local intermediaries who would support them at all stages of the renovation process.

Finally, the introduction of skills cards for construction workers and construction professionals, as well as a mandatory live register, would allow end-users to easily identify construction workers/professionals who have upskilled in energy efficiency.





The lack of investment in skills at all levels of the supply chain represents one of the main risks to the successful implementation of the strategy.

Depending on training and engagement, construction workers and construction professionals can act as advisor or as negative influencer - they interact with end-users at trigger points on a daily basis.

In particular, we recommend to embed basic building physics - including for traditional buildings, risk evaluation, BIM and consumer interaction into all relevant construction professional and vocational pathways.

As the construction industry is picking up, it becomes more and more challenging for construction workers and construction professionals to find time to upskill. Actions should be taken to better incentivise the construction industry to upskill in the area. End-users' insistence for high quality work could also act as a driver for upskilling.

Yet, educational institutions, trade associations and product manufacturers all have a role to play in upskilling the industry that needs to be clearly defined. It is thus recommended to incorporate a comprehensive section on upskilling in Ireland's National Renovation Strategy V.2.





Poor quality retrofits can cause bigger issues than the problems they seek to solve – E.g. They can potentially have a detrimental impact on a property and the health of its occupants, thus damaging the industry's reputation. High standards and robust quality assurance for projects from start to finish are key in building consumer confidence.

For all these reasons, we suggest to introduce standards for construction workers' and construction professionals' qualifications - 6, as well as elementary and deep retrofit overall performance standards.

Existing legislation, standards and guidelines must be consolidated and built upon to remove any contradictions. Some potential reforms should also be explored further.

These include:

- Introducing statutory standards for indoor air quality
- Introducing standards for energy performance in all new/ long term public sector leases
- Introducing mandatory minimum energy efficiency improvements as part of any domestic renovation or extension where appropriate



In the private rental market, linking any lease changes to mandatory minimum energy efficiency retrofit or introducing a gradual ban on leasing of residential properties that do not meet minimum actual energy performance requirements

The legislative framework should encourage all stakeholders to make a real difference. In the public sector, this could be achieved through ring-fencing, i.e. by giving public bodies' discretion (post-renovation) to redeploy budget resources no longer needed within their annual budget allocation to pay for energy to other areas of their operating budget. Extending DEC to all commercial buildings and making this information widely available online, including for small lets. could lead to an increase in deep renovation in this sector.

Finally, all regulations and standards should be aligned with our decarbonisation objectives and fully up to date.



DEVELOP QUALITY DATA

Long-term quality data analytics are vital in dynamically informing the strategy and making sure it adapts to change.

The government and members of the supply chain collect significant amounts of data. However, these are not always captured in a useful way. While we acknowledge the need to protect consumers' privacy, energy, education and health data, as well as national and local data, should be married and studied in a more comprehensive way. If properly captured and used, this data could provide useful information to end-users and policy decision-makers.

Further renovation-related research is urgently needed in several topics, including on the existing building stock, actual building performances, best practice for Ireland, human behaviours and deep renovation co-benefits.

Research should be better coordinated between private organisations and research bodies to better translate into practical action.

COLLABORATE & ENGAGE

To reach its full potential, the national renovation strategy must be defined and implemented in a transparent, fair and inclusive way.

The publication of the strategy by DCCAE in April 2017 should mark the beginning, not the end of the process. We recommend that an open and collaborative approach is taken for the implementation of the strategy to provide all key stakeholders with opportunities to engage.

As continuous improvements will be needed to keep up with best practices, product development or new technologies, the ongoing strategy process should be smart and adaptive. This could for instance be achieved through a collaborative national implementation platform.



TOWARDS AN IMPACTFUL NATIONAL RENOVATION STRATEGY ENABLING LARGE SCALE DEEP ENERGY RENOVATION IN IRELAND



FEBRUARY 2017



TOWARDS LARGE SCALE DEEP ENERGY RENOVATION UNLOCKING IRELAND'S POTENTIAL

This section sets out key recommendations for a better national renovation strategy V.2 in greater details.



DEVELOP A COMPREHENSIVE NATIONAL FRAMEWORK

1.1 Beyond climate targets, large-scale deep energy renovation can have a positive impact on job creation and a myriad of social benefits.

An integrated cross-departmental approach is thus needed to develop and implement an ambitious national energy renovation strategy. The full involvement and commitment of the departments of climate action, housing, finance, public expenditure and reform, education, arts and heritage, health, social protection, as well as jobs in designing and implementing the strategy is necessary.

1.2 In order to avoid a piecemeal approach, national and local initiatives must be better connected through a planned, multiscale and long term strategy.

1.3 At project level, better cross-sector engagement is required. Designers, contractors, facility managers, end-users, etc. must be encouraged to engage with each other. Higher engagement could for instance be achieved through the introduction of building performance leases and skills cards.





2.1 A stable and long-term framework is required to provide all players with certainty - There is no time for ambiguity. In fact, certainty on the long-term direction would create the right conditions for securing investment.

2.2 The Paris Agreement and EU targets provide some predictability and confidence for key players. Yet, the role of national and local targets should not be underestimated.

Clear and concise goals can help with visualising the scale of the task ahead, hence helping the debate with key stakeholders. In particular, the introduction of targets and interim performance targets for each building type (commercial, residential and public) is recommended. These should be complemented by localised targets to better connect with local communities.

In the public sector, setting long-term targets at organisations level (e.g. at a department or agency level) would increase accountability.

2.3 Once an agreement on a destination and an implementation time period is reached for each building sector, one should back-cast from these targets. The process of back-casting is one of defining a vision of a desirable future and then articulating a pathway to that future from the present day. Back-casting can be a useful tool in dealing with uncertainty by developing a shared set of expectations among stakeholders. Through this process, a comprehensive cost-benefit analysis of all the potential pathways could be developed. 2.4 Targets and interim targets are key in allowing regular tracking of progress. As this process should be as transparent as possible the launch of an online dashboard showing progress for each building sector is suggested.
However, better quality data on the existing building stock is a prerequisite – see 8.



3.1 As it currently stands, Ireland is likely to be fined for not reaching its binding 2020 climate/energy targets. Instead of paying substantial fines in 2021, it is advised to invest the money in deep renovation now.

3.2 A long-term investment strategy for deep energy renovation, including of large public sector buildings such as hospitals and prisons is required. Where possible, large scale retrofitting should be considered as infrastructure investments.

3.3 The aggregation of projects should be supported as a way to lower costs, improve quality and facilitate access to funding. In the public and commercial building sectors, this would have a positive impact on the development of the ESCO model – see 3.14.

3.4 Assistance and coordination should be given to the public sector to access the full range of possible funding including EIB and EU cohesion funds. Significant funding for the energy efficient renovation of buildings is currently available under these schemes. E.g. the Picardie region in northern France recently secured €1.8 million from the EIB to develop its Pass Rénovation - a technical and financial tool to unblock the energy renovation market in private housing.

3.5 In the private residential sector, funding mechanisms should better support deep retrofits, including phased deep retrofits[1] where appropriate[2].

This could be initially achieved through more composite grants for homeowners and landlords, and multi-annual funding agreements. While budgetary cycles often lead to "rush projects", multi-annual funding agreements for programmes such as the Better Energy Programme could address this issue.

3.6 The number of people living in rented accommodation in Ireland is growing. More than 55% of the private rented dwellings are likely to be considered to have poor energy efficiency, with BERs between D and G [3]. There are a number of barriers to energy efficiency activity in the rented sector that, in the absence of Government intervention to address them, lead to rented properties typically being less energy efficient than owner occupied housing. Beyond grants, the extension of the Accelerated Capital Allowance (ACA) to landlords should thus be considered.

3.7 As energy renovation and Ireland's decarbonisation objectives are deeply connected, feed-in tariffs for homeowners to supply to the grid, if only on a pilot base, should be considered.

3.8 In the social housing sector, allowing funding to rollover (e.g. 3 years programmes) would allow for proper planning, deeper retrofit and ensure continuity of the funding stream. In particular, a mechanism should be in place to allow local authorities to assess funding and plan for long-term stock upgrades. In that regard, the publication of a spreadsheet similar to the one used by SEAI for domestic grants would be helpful.

3.9 In commercial buildings, where there is not enough data or where it does not make financial sense yet (e.g. due to the cost of the technology), deep retrofit uptake should be supported through tax incentives. In particular, the extension of the Accelerated Capital Allowance to cover retrofitting solutions and feed-in tariffs for private organisations to supply to the grid should be considered. 3.10 Prior to the introduction of new energy efficiency support schemes, it would be prudent to review existing national schemes, some international projects, and any potentially unintended consequences of suggested actions.

In particular, to ensure past mistakes are not replicated, grants and tax incentives should be tied to buildings (as opposed to people), property locations should be better taken into account and quality monitoring of both the renovation process and the completed dwellings should be increased.

3.11 While targeted and effective government incentives could be part of the solution, the scale of the challenge means that private investment will also need to be mobilised.

3.12 Banks and credit unions can both play a role in supporting large scale energy renovation. In the private residential sector, the introduction of low interest loans (green loans) for homeowners who undertake deep energy renovation should be supported. Beyond home buyers, green mortgages covering buy-to-rent and top-up mortgages could have a significant role to play. Loans for financing deep retrofit should be less risky for banks and homeowners as the lower operational cost and greater valuations over time reduce the risk of mortgage default. 3.13 While many private organisations do not own the building they are in, building performance leases could provide an opportunity to tackle the split incentive issue between tenants and landlords in the commercial building sector. A building performance lease is a lease agreement which is intended to ensure that a leased property is used and managed in a manner which fosters sustainability. This is a tool for engagement between landlords and tenants to facilitate the better sharing of data on the operation of the building.

3.14 Transferring technical and other risks through energy performance guarantees is a potential route to deep energy renovation. Energy Service Companies (ESCOs) use energy savings to fund solutions without upfront investment required from the building owner. Given the size of the Irish market and potential projects and the low energy intensity of our economy, project aggregation – see 3.3 - and facilitation is required if the ESCO model is to work here. As quality energy performance data (including post-occupancy) are vital to the success of this model, the use of the International Performance Measurement and Verification Protocol (IPMVP) is recommended.





4.1 Awareness of energy-efficient renovation, and more specifically awareness of specific interventions and deep renovation co-benefits, remain low at all levels of Irish society.

4.2 As a lack of awareness could present a major risk to the strategy, a comprehensive communication plan should be developed and incorporated into the final document.

4.3 Coordinated awareness campaigns should be run at both national and local levels. However, this won't be enough on its own, high standards and upskilling of the industry are prerequisites – see 6 & 7.

4.4 Multiple strategies are required to better target various segments of society. Awareness campaigns should be well targeted and avoid jargon. For instance, simple financial messages around energy bill savings are not appropriate for all end-users. Better promotion of deep renovation cobenefits and higher emotional engagement are needed.

4.5 Likewise, different communication channels must be used to target various groups of society. E.g. chambers of commerce or local enterprise boards may have a role to play in promoting energy efficiency among SMEs. The inter-departmental approach suggested in 1.1 is key in raising energy awareness among different demographic profiles. E.g. the Department of Education could play a significant role in behaviour changes among students.

4.6 However, a prerequisite to 4.4 and 4.5 is a better understanding of various groups' motivations and behaviours, as well as routes of engagement and influence – See 8.

4.7 The public sector have a leadership role to play in promoting deep energy renovation (SI No. 426/2014). The diversity of public buildings means that it's a microcosm of what will need to happen in other sectors.

It should thus play an exemplary role in showcasing good high-quality solutions in public buildings and social housing. Local authorities are responsible for 144,000 homes. These homes offer a unique opportunity to deliver deep retrofit at scale, as well as to showcase its potential. Retrofitting schools to high quality standards could also have a multiplier effect on the level of deep retrofit awareness in Ireland.



Furthermore, where public buildings are retrofitted, a lessons learnt approach should be taken from these projects to enable a more robust roll out of future retrofits. In brief, retrofitted public sector buildings should themselves be used as learning and demonstration tools.

4.8 To achieve the highest impact, a combined top-down and bottom-up approach should be taken.

Government leadership and a clear political commitment are needed. In the public sector, clear leadership from centralised agencies and departments would allow for adequate energy efficiency goals to be set from planning stage, better postoccupancy performance monitoring and higher accountability in terms of energy targets.

However, community-based approaches and local champions (e.g. local authorities and energy agencies) have a key role to play too. Research conducted by the nZEB-RETROFIT team in NUI Galway on rural one-off household's motivations for involvement in a renovation scheme found that formal and informal community networks are vital. The power of word of mouth and local champions should not be underestimated as people tend to trust their neighbours and local community more. High quality local case studies and open house type events should be developed and organised across the country.

4.9 Developing and sharing better quality data would also make energy renovation more desirable – see 8. E.g. putting accurate monetary value against the co-benefits of deep energy renovation in the commercial sector and communicating it would help in building the business case for same; including infographics on how one household's energy use compares with similar dwellings in the area in monthly electricity / gas bills or providing every dwelling with a provisional BER (based on the type of building, floor area and the year of construction) as it has been done in the Netherlands could also be useful.

4.10 To sum up, the communication plan should leverage every channel to make more energy efficient buildings an assumed and aspired standard in Irish society.



5.1 Quality energy upgrades must be made more convenient and accessible. Beyond financial support – see 3 – this could be achieved through various mechanisms listed in this section.

5.2 In all sectors, the publication of clear, comprehensive and up to date information and guidance, including high quality case studies and Publicly Available Specifications (PASs) based on research and industry engagement should contribute to an uptake in deep energy renovation.

All official guidance should be assessed for compliance with surface condensation risk factors.

5.3 For traditional buildings, Technical Guidance Documents should be developed to ensure appropriate methods and materials are used. E.g. materials used in energy efficient renovations of historic buildings must be hygrothermally appropriate.

Conservation guidelines to minimise the impact of modern renovation systems on the cultural significance of historic buildings should be introduced. The guidelines should not be prescriptive or technically specific, but they should clearly identify the main issues and consider relevant conservation principles. International guidance models already exist and ICOMOS Ireland could perhaps support the government with the development of these guidelines.

5.4 The development of common templates for evaluating energy renovation projects using a triple bottom line approach (i.e. quantifying environmental, social and economic impacts) would also be useful. Such templates could be used by local authorities and other social housing providers for making the business case for deep renovation as part of funding applications, but also by investors willing to weigh the opportunity of retrofitting multi-unit buildings. 5.5 For large scale projects, the implementation of more automated approaches such as Building Information Modelling (BIM) and Building Energy Management System (BEMS), allowing for more accurate, time-saving, and collaborative project management should be encouraged.

5.6 These should be complemented by the introduction of simple holistic energy assessment and /or building passports which would include a masterplan for retrofit and a record of works, thus allowing for a step-by-step approach to deep renovation.

This would be particularly useful in better incorporating shallow retrofits into deep retrofit as research has shown that households and SMEs who have engaged in shallow measures are more likely to consider other energy efficiency actions.

5.7 Beyond the publication of impartial information and guidance, residential end-users and SMEs would benefit from the development of a network of skilled, trusted local intermediaries who would support them at all stages of the renovation process. The network should be sustainable in the long term and could be made of local energy agencies and / or local partnerships between architects, banks and organisations such as Citizens Information.

5.8 The introduction of skills cards for construction workers and construction professionals, as well as a mandatory live register, that would allow end-users to easily identify construction workers/professionals who have upskilled in energy efficiency could also be part of the solution – see 6.

5.9 Finally, in order to make quality energy upgrades as convenient as possible, strategic planning and scheduling for minimum disruption should be used.





6.1 The lack of investment in skills at all levels of the construction supply chain represents one of the main risks to the successful implementation of the strategy.

6.2 Depending on training and engagement, construction workers and construction professionals can act as advisor or as negative influencer.

They interact with end-users at trigger points on a daily basis and could play a significant role in ensuring a high number of building material alterations taking place in Ireland are low carbon.

Yet to act as powerful channels, estate agents, architects, valuers, surveyors, construction workers, bankers and solicitors all need to be trained and to gain a good understanding of deep renovation co-benefits.

6.3 In the construction industry, we recommend to embed basic building physics - including for traditional buildings, standards, risk evaluation, BIM and consumer interaction into all relevant professional and vocational pathways. Better trained construction workers and construction professionals will be able to better advise end-users at key trigger points.

6.4 Where insufficient research, industry engagement and agreement on best practices has occurred to date, PASs should be published to allow for the development of appropriate training programmes. For instance, the publication of PASs for internal and external wall insulation, indoor air quality, air tightness and ventilation would be useful.

6.5 As the construction industry is picking up, it becomes more challenging for construction workers and construction professionals to find time to train in energy efficient renovation. As such, actions should be taken to better incentivise the industry to upskill in the area. End-users' insistence for high quality work could act as a driver for upskilling. Yet, this can only be achieved if deep renovation awareness is raised – See 4.

On the other hand, public bodies and larger private organisations could first include appropriate skills requirements in their tender documents as it is already done for heritage contractors. Retrofitted public buildings could subsequently be used as learning and demonstration tools.

6.6 The introduction of skills cards for construction workers and professionals and the launch of a mandatory live register should make that process easier – see 5.8. Skills cards provide proof that individuals working on a construction project have the required training and qualifications for the type of work they carry out. While the live register should be well supervised, the registration process should not be too burdensome in order not to fuel the black market.

6.7 As mentioned in 6.1 and 6.2, the whole construction supply chain needs to upskill and not only construction workers and construction professionals.

In the public sector, further training in the administrative and technical part of procurement may be required as staff must understand how both construction and public procurement work. This could potentially be achieved through higher cooperation with the private sector and / or through a more centralised procurement process involving the creation of a centre of excellence in deep renovation and public procurement.

6.8 Educational institutions, trade associations and product manufacturers all have a role to play in upskilling the industry and in better promoting lifelong learning. As this role needs to be clearly defined, it is recommended to incorporate a comprehensive section on upskilling in Ireland's National Renovation Strategy V.2.



7.1 Poor quality retrofits can cause bigger issues than the problems they seek to solve – E.g. They can potentially have a detrimental impact on a property and the health of its occupants, thus damaging the industry's reputation.

7.2 High standards and robust quality assurance for projects from start to finish are key in building consumer confidence.

7.3 For all these reasons, the introduction of statutory standards for construction workers' and construction professionals' qualifications – see 6, as well as elementary and deep retrofit overall performance standards are suggested.

7.4 While existing legislation, standards and guidelines must be consolidated and built upon to remove any contradictions, and to better take into account the various needs of occupants, other potential reforms should also be considered. These include:

- 7.4a Introducing regulatory standards for indoor air quality
- 7.4b Introducing standards for energy performance in all new/ long term public sector leases
- 7.4c Introducing mandatory minimum energy efficiency improvements as part of any domestic renovation or extension where appropriate.

Similarly, Part L should be changed to cover extensions of protected dwellings.

 7.4d As the split incentive issue and the short length of leases in Ireland currently prevent the take up of deep energy renovation in the private rental market, some specific measures should be taken. This could include linking any lease changes to mandatory minimum energy efficiency retrofit or introducing a gradual ban on leasing of residential properties that do not meet minimum actual energy performance requirements where appropriate. However, any new legislation in that direction should be complemented by appropriate financial support – see 3.6. 7.5 The legislative framework should encourage all stakeholders to make a real difference.

7.6 In the public sector, this could be achieved through ring-fencing, i.e. by giving public bodies' discretion for a limited number of years post-renovation to redeploy budget resources no longer needed within their annual budget allocation to pay for energy to other areas of their operating budget.

Furthermore, a better enforcement of green public procurement rules should be supported. More specifically, design and construction service briefs should be extended to include requirements for monitoring and soft landing services. Making long term performance targets mandatory – as suggested in 2.2 – would assist in changing the current outlook.

7.7 In the commercial sector, it is suggested to extend Display Energy Certificate (DEC) to all commercial buildings and to make this information widely available online, including for small lets.

7.8 Besides, S.R. 54 should be extended to cover nonresidential buildings. However, it should first be thoroughly revised and subjected to a systematic hygrothermal analysis.

7.9 Given the risks that inappropriate deep energy renovation of historic buildings may pose to human health and physical fabric, specific clauses and waivers may be required.

7.10 Finally, all regulations and standards should be aligned with our decarbonisation objectives and brought fully up to date.





8.1 Long-term quality data analytics are vital in dynamically informing the strategy and making sure it adapts to change.

8.2 The government and members of the supply chain collect significant amounts data. However, these are not always captured in a useful way. While we acknowledge the need to protect consumers' privacy, energy, education and health data, as well as national and local data, should be married and studied in a more comprehensive way. If properly captured and used, this data could provide useful information to end-users and policy decision-makers. This would also increase trust and confidence in the sector.

8.3 Although this should not lead to "analysis paralysis", further renovation-related research is urgently needed in several topics. These include:

- 8.3a The existing building stock: Comprehensive data is key for accurate baselining and planning, hence the need to collect good quality data on the existing building stock in terms of buildings' age[4], building materials and systems, energy efficiency, ownership as well as temperature profile, relative humidity and CO2. These data will help to inform a more effective retrofit strategy.
- 8.3b End-users' main motivations, behaviours and preferences.
- 8.3c Actual building performances: Good quality studies have been conducted on this topic in several countries (e.g. in the UK and in Germany). Although this information is useful, monitoring and verification studies of retrofit projects completed in Ireland and with good historical energy use data with which to analyse the impact of the retrofits are needed. This will help in identifying technologies and upgrades which are working best in Ireland, and inform guidance documents and PASs development.
- 8.3d On deep renovation co-benefits: Putting accurate monetary values against asset appreciation, health

and wellbeing, productivity increase, as well as energy savings would help in building the business case for deep renovation.

This would allow us to better understand, for instance, how the impact of BERs on the residential market could be improved or why the Energy Performance Contracting (EPC) framework hasn't gained traction in Ireland yet.

8.4 Finally, research should be better coordinated between private organisations and research bodies to better translate into practical action. E.g. specialised publicprivate labs/teams could undertake specific collaborative projects on renovation related issues.





9.1 To reach its full potential, the national renovation strategy must be defined and implemented in a transparent, fair and inclusive way.

9.2 Ireland's National Renovation Strategy V.2 must include a detailed implementation plan assigning responsibilities, thus allowing for accountability.

9.3 The publication of the strategy by DCCAE in April 2017 should mark the beginning, not the end of the process. We recommend that an open and collaborative approach is taken for the implementation of the strategy to provide all key stakeholders with opportunities to engage. 9.4 As continuous improvements will be needed to address weaknesses and to keep up with best practices, product development or new technologies, the ongoing strategy process should be smart and adaptive.

9.5 This could for instance be achieved through central coordination and the setup of a collaborative national implementation platform.

The coordination role could, for example, be play by a Minister or the state architect with dedicated central resources to "conduct the dance".

In parallel, the national implementation platform could play an advisory role, making sure all key players remain involved. This role could be played by SEAI or the IGBC with potential connections with the energy citizen forum. Key actions would include updating and consulting the Build Upon Community on a regular basis, as well as monitoring and evaluating progress.

[1] This would be further supported by the introduction of building passports – see 5.

[2] In some cases surface condensation risks could be exacerbated during an interim phase of an energy efficient renovation. As long term value may only be apparent after 3 or more years, thought could be given to phased release of grant aid. Building fabric can take time to dry, savings may only be proven after more than one heating season.

[3] Strategy to Combat Energy Poverty 2016-2019

[4] A dataset similar to Waag in the Netherlands would be useful. http://code.waag.org/buildings/.



RISKS & CHALLENGES

Several risks to a successful implementation of the strategy were identified during the consultation process. These are listed in this section

Lack of investment in upskilling of the construction supply chain

Skills failure at any level of the construction supply chain could significantly jeopardise a successful implementation of the strategy. In fact, lack of skills could lead to a lack of coherent advice, poor quality work and ultimately to a general lack of confidence in the process as cases of building / health damages from inappropriate upgrading works emerged in the press.

Lack of investment in communication

Workshop participants expressed concerns at the lack of funding for communication. Irish Water's current situation shows the importance of investing in communication.

A non-functioning housing market

A non-functioning housing market could have a negative impact on the implementation of the strategy. While new builds are important, one should not forget that two-thirds of our existing properties are likely to be standing in 2050.

Lack of cross-party political buy-in

A lack of full political buy-in could lead to inertia, to a lack of funding, and to a lack of long term strategic thinking, leading to the development of conflicting policies and legislation over time.

Changing demographics and economics

The intersection between housing, planning, and demography is complex. Future demographic changes need to be considered to ensure past mistakes are not repeated.

At the macro-level, changes in the economic path and direction could threaten the strategy. For all these reasons, over dependence on governmental funding or over reliance on the market should be avoided.

Finally, low energy prices could potentially limit large scale deep renovation uptake in Ireland as financial savings would not be perceived by end-users.

Future technological changes

The speed of change as technology advances also presents specific challenges. We must ensure that standards, guidance and advice are able to stay current and relevant.

ABOUT THE CONSULTATION PROCESS

In 2016-17, Ireland hosted a series of workshops focusing on the design and delivery of its National Renovation Strategy V.2. These have been a mixture of national events, local events and European events connecting national leaders with other European leaders working on their national renovation strategies.

This drawing explains how the content of this document was developed. Please click on the drawing to see a short video of the process.



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THANK YOU TO ALL OUR WORKSHOP PARTICIPANTS



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GLOSSARY

Build Upon Community: The Build Upon community is made up of the close to 200 key stakeholders who took part in this consultation process across Ireland. These are listed p. 22 of this report.

Building performance lease: is a lease agreement which is intended to ensure that a leased property is used and managed in a manner which fosters sustainability. Building performance leases are a tool for engagement between landlords and tenants to facilitate the better sharing of data on the operation of the building. These can range from legally enforceable lease clauses which are integrated into the lease, to non-legally binding Memorandums of Understanding (MoUs) between the parties.

Carbon dioxide (CO2): CO2 is a compound of carbon and oxygen formed when carbon is burned, including when fossil fuels are used for heating, transport and electricity generation. It is one of the main greenhouse gases (GHGs).

Better Energy Programme: The Better Energy Programme is administered by the Sustainable Energy Authority of Ireland (SEAI). This includes the Better Energy Homes scheme, the Better Energy Warmer Homes scheme, the Better Energy Warmer Homes Area based programme and the Better Energy Communities programme. Further information on these schemes is available at www.seai.ie.

Deep retrofitting: is an extensive package of building energy efficiency improvements that have a high upfront cost, but can lead to significant energy savings. Examples include external insulation, installation of heat pumps, and installation of triple glazed windows.

Energy Performance Contracting (EPC): An energy performance contract is an agreement between a nondomestic energy consumer and a vendor whereby the vendor implements energy efficiency improvements and guarantees the energy savings. An EPC can overcome the need for upfront capital investment by the host organisation, as the investment is paid for over time by the value of the energy savings achieved. The capital investment is often financed by a third party financier. **Energy poverty:** A person can be said to be in energy poverty when he/she is unable to adequately heat or power their home. It is a function of the thermal efficiency of a person's home, the cost of energy and his/her income.

Poor quality retrofits: refer to poorly designed and specified retrofits, well-built but poorly specified retrofits, as well as to well-specified but poorly built retrofits.

Greenhouse gases (GHGs): Greenhouse gases refer to a wide range of gases that contribute to climate change. These include carbon dioxide, methane, nitrous oxide and a group of gases known as F-gases.



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