TOWARDS LARGE SCALE DEEP RENOVATION – UNLOCKING IRELAND'S POTENTIAL

DEVELOPING A FRAMEWORK FOR HOLISTIC ENERGY EFFICIENCY TRAINING OF BUILDING PROFESSIONALS

ECCoPro Report 4

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www.igbc.ie

IGBC
IRISH GREEN BUILDING COUNCIL

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ABOUT THE IRISH GREEN BUILDING COUNCIL

The Irish Green Building Council (IGBC), is the leading voice on sustainable building in Ireland. With a network of over 100 member organisations, the IGBC is working to transform the Irish construction and property sector into a global leader in quality and sustainability.

To do so, the IGBC has developed several sustainable building tools, including the Home Performance Index - Ireland's first national certification system for quality and sustainable residential development – and an Environmental Product Declaration Platform. The IGBC has also developed an extensive green building education programme, which includes BREEAM, LEED and LCA training courses.

See: www.igbc.ie

Acknowledgements
Thanks to all the organisations and individuals who have contributed to this report. In particular we would like to thank those who joined us for the ECCoPro kick-off meeting, and the two subsequent workshops on 19th October and 5th December 2017. We would also like to thank those who took part in the initial consultation process in November 2016 as part of the Build Upon project, as well as our workshop facilitator, Chris Chapman.

EccoPro workshop participants are listed page 13 of this report.

BUILD UPON

DISCLAIMER
The views expressed in this report are those of the Irish Green Building Council staff and do not necessarily reflect the views of all other parties listed page 13.

CONTENT

INTRODUCTION

Signals of climate change impacts are evident in Ireland. These include changes to key meteorological parameters such as average temperature, rainfall intensity and patterns, as well as ecosystem changes (1). With buildings responsible for 36% of CO2 emissions in the EU and most of our building stock predicted be still standing in 2050 increasing rate of the energy efficient renovation must be a top priority. As many as one million Irish homes are considered significantly energy inefficient and requiring upgrade work between now and 2050 (2).

Against this background, the Irish Green Building Council, in conjunction with the Department of Communications, Climate Action and Environment (DCCAE), run a comprehensive consultation process in 2016 to co-design an ambitious national energy renovation strategy for Ireland. During that process, workshop participants highlighted that, depending on training and engagement, construction workers and construction professionals can act as advisor or as negative influencer; hence the necessity to better incentivise them to upskill in energy efficiency and sustainability (3).

▶ PROJECT OVERVIEW

As the lack of investment in skills at all levels of the construction industry supply chain represents one of the main risks to large scale energy renovation in Ireland, the Irish Green Building Council started exploring the opportunity of introducing a user-friendly energy efficiency accreditation system for construction professionals (ECCoPro) in September 2017.

The objective of such a scheme would be to support closer alignment between professionals and to allow end-users to clearly identify construction professionals who have upskilled in energy efficiency related skills. This in turn should incentivise professionals to upskill in the area.

About building professionals

The term built environment professionals is generally used to describe all groups of stakeholders and professions that are directly and indirectly involved in the design, operation, preservation and development of the built environment.

Following extensive discussions during workshops 1 (4) and 2 (6), it was decided to speak about building professionals as opposed to construction professionals as this term is more inclusive. A list of professions who should be targeted as part of this project was subsequently established. These are architects, architectural technologists, contract managers, project managers, site managers, civil and structural engineers, building services engineers, mechanical and electrical engineers, property and facilities managers, building surveyors, clerks of works, valuers, estate agents and quantity surveyors.

The ECCoPro initiative primarily targets employed and unemployed building professionals. However, the findings of this work will be used to better inform higher education institutions, so that within 4 to 5 years all graduates emerge from third level institutions with the right skillset.

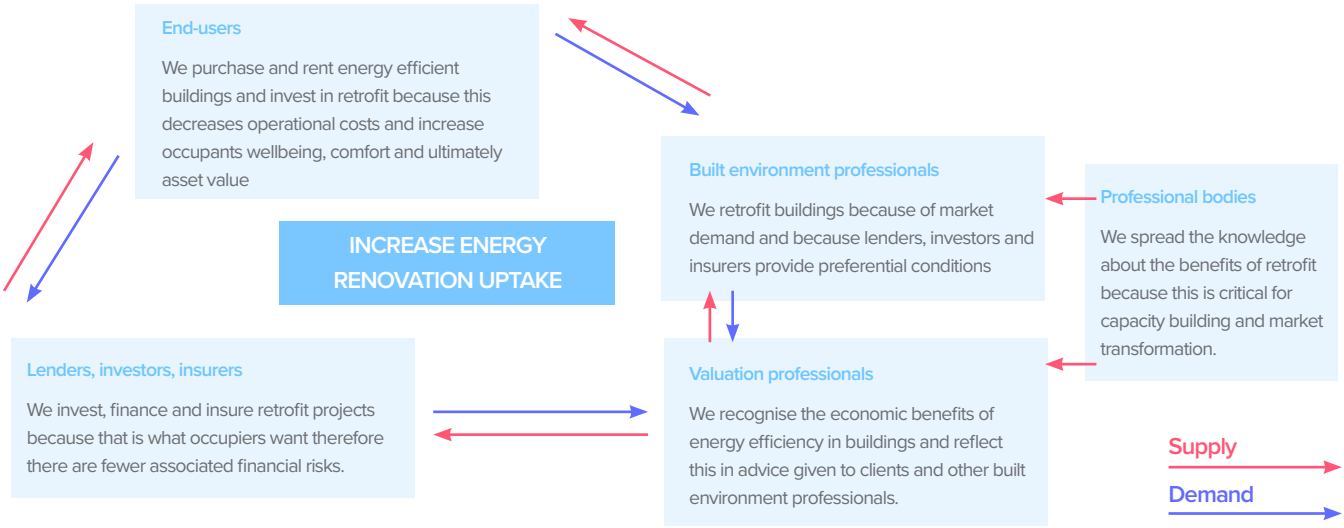

Fig. 1: Supporting Energy Renovation Uptake: The Role of Building Professionals – Adapted from Hartenberger and Lorenz, 2013

▶ The Dialogue Journey

A "Construction professionals' energy efficiency knowledge and upskilling – A short review" (6) document was published in September 2017. The report was developed to be used as a source of reference by all organisations involved in the development of a user-friendly holistic energy efficiency certification system for building professionals.

The IGBC is now hosting a series of workshops focusing on the design and delivery of this accreditation system.

▶ REPORT STRUCTURE

The aim of this report is to present the results of the first part of the ECCoPro consultation process: October 2017 to January 2018.

The first part of the report describes how a framework for holistic energy efficiency training of building professionals could operate. The second part presents an attempt to define key energy efficiency skills for each group of building professionals.

At the end of the report (in the conclusion section), next steps and current challenges are described in greater details.

Some of the more unusual but important words used are explained in the glossary of terms and acronyms. These words are in bold type throughout the report.

The project is due for completion in April 2018 and this is still very much a work in progress. Interested parties are invited to provide feedback on this document and process to Marion@igbc.ie.

A FRAMEWORK FOR HOLISTIC ENERGY EFFICIENCY CERTIFICATION OF BUILDING PROFESSIONALS

This section sets out initial recommendations for a framework which would provide users with greater certainty of the abilities of building professionals and incentivise these professionals to upskill in energy efficiency.

▶ 1.1 BUILD TRUST IN THE FRAMEWORK

1.1.1 To incentivise building professionals to upskill in that area, and ultimately to increase energy renovation uptake, it should not just be another framework. It must be THE framework.

1.1.2 It must be stable and trusted by all key stakeholders i.e. **users, building professionals,** professional bodies, third level institutions and the Irish construction industry in general.

1.1.3 In order to create that level of trust, the framework must be supported by organisations who can provide both leadership and authority.

1.1.4 Accreditation is only one part of the equation and policing the framework is equally important. The integrity and fairness of the accreditation system must be guaranteed. Beyond minimum knowledge and experience requirements, it is suggested that all certified professionals sign off to a code of practice.

1.1.5 Professional bodies are trusted by building professionals and have access to them. They must hence be highly involved in promoting and operating the framework.

1.1.6 However, it seems that users' trust in the system would increase if it was endorsed by a neutral, nationally trusted organisation such as SEAI, the Department of Housing or the Irish Green Building Council. Public bodies' endorsement is particularly needed if the framework is to become a framework of reference. Furthermore, a public body is likely to have more resources to maintain, promote and police the system.

▶ 1.2 CREATE A SIMPLE & MANAGEABLE SYSTEM

1.2.1 With recent policy developments such as NZEB, the Irish construction sector is confronted with the urgent need to update the energy efficiency skills of its workforce (6). However, as the construction industry is picking up and as most building professionals work in small organisations (7), it can be challenging for them to find time and/or resources to upskill. Against this background and given the voluntary nature of the framework, it must be kept simple to create a momentum.

1.2.2 In the context of the Paris agreement, of EU's targets, and with NZEB coming into force shortly focusing on energy efficiency skills first – as opposed to broader sustainability skills - makes sense. Yet, energy efficiency on its own can be risky. E.g. it can lead to moisture or radon issues. Furthermore, users are also often more interested in other aspects associated with energy renovation, such as comfort or property values (8, 9). For all these reasons, a holistic approach to energy renovation upskilling should be taken[1].

1.2.3 Given the need to raise energy efficiency knowledge across the board, it is suggested to launch the framework with a single level of certification to create a momentum for upskilling. Other levels of certification could be developed in the next few years for professionals who wish to specialise in the area, but this should not be the priority.

1.2.4 The energy efficiency skillset required by architects is obviously very different from what is required for valuers or facilities managers. Nevertheless, as multidisciplinary skills and cross-sector approaches are key for all **building professionals** (4, 10), it does not make sense to create too many separated pathways to accreditation - This would also be highly unpractical.

1.2.5 To keep the system simple and manageable, it is hence suggested to cluster **building professionals** into

[1] If successful, the framework could be further developed in the next few years to cover sustainability in its wider sense.

three groups with separate pathways to certification. These groups are 1. Registered Architect, Chartered Engineer and Chartered Building Surveyor listed under BC(A)R as competent to design and certify buildings, 2. Other construction professionals i.e. architectural technologists, contract managers, project managers, site managers and facilities managers, and 3. Property professionals i.e. valuers, estate agents and quantity surveyors. A list of key energy efficiency skills identified for each of these 3 groups is available in the "key energy efficiency skills for building professionals" section below.

▶ 1.3 DRIVE UPSKILING DEMAND

1.3.1 As previously mentioned the overall framework must be simple and manageable if it is to be successful. Likewise, the certification process should not be too burdensome for building professionals.

1.3.2 More specifically, when it comes to theoretical knowledge requirements (2), prior learning must be recognised.

1.3.3 The framework must be designed to allow building professionals to easily identify the skills they are missing[2] and how they can acquire them through small incremental steps. The list of training courses put together in September 2017 (6) should thus be further developed to allow building professionals to easily identify steps to take.

1.3.4 Training and education programmes recognised as part of this certification process must be of high quality and highly practical. They may for instance include case studies of exemplar energy renovation project or site visits.

1.3.5 As most building professionals have limited time available, training and education programmes should be delivered in a flexible way (e.g. online or with option of training in the evenings and weekend) and, where possible, tied to building professionals' work.

1.3.6 Where training gaps were identified (e.g. communication skills, whole building approach, energy renovation of non-residential buildings) (5), it is anticipated that training and education bodies will cover these gaps when it becomes a requirement for certification.

1.3.7 As the certification system is unlikely to become mandatory in the short term, other way to incentivise building professionals to upskill in the area may be considered. These include initiatives by professional bodies to raise awareness and financial support for upskilling. In the medium term, one suggestion is for professional bodies to only accredit academic courses which fully cover these topics [3] or to make that certification mandatory as part of the chartered process.

▶ 1.4 OTHER CONSIDERATIONS

1.4.1 Taking into account legal considerations, it won't be possible to guarantee that a certified building professional is competent in energy renovation. Yet, the certification process will guarantee that they have completed a certain number of hours of training / education in that field and that they have x years of experience.

1.4.2 Although the focus of the framework is on energy efficiency, the certification scheme should be designed to be compatible with other programmes such as LEAN Construction Ireland and the conservation accreditation.

1.4.3 As developing such a scheme will be complicated, it is suggested to start with a small pilot, to assess it and to reiterate the process until all parties are mostly satisfied.

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[2] See "key energy efficiency skills for building professionals" section below.

[3] This would ensure that this knowledge is embedded in future building professionals right from the beginning of their carreer.

▶ 1.5 SUMMARY

A framework for holistic energy efficiency certification of building professionals.

Neutral, nationally trusted organisation e.g. SEAI, IGBC

Administrate and Police the framework - Promote it among users

Professional Bodies

Define / Improve pathways to certification - Certify building professionals

ASHRAE ACEI CIBSBE Engineers Ireland Institution of Civil Engineers Institution of Structural Engineers RIAI SCSI	ACEI ASHRAE CIBSBE CIF CIOB Engineers Ireland Institution of Civil Engineers Institution of Structural Engineers RIAI	SCSI IPAV

Define pathways to certification
Promote certification
Certify building professionals

Provide feedback on pathway to certification

Group 1
Registered Architects
Chartered Engineers and
Chartered Building Surveyors
listed under BC(A)R

Group 2
Architectural technologists
Contract managers
Site managers
Project managers
Facilities managers

Group 3
Property professionals i.e.
valuers, estate agents and
quantity surveyors.

KEY ENERGY EFFICIENCY SKILLS FOR BUILDING PROFESSIONALS

▶ 2.1 INTRODUCTION

2.1.1 Building professionals are interdependent specialists. Multidisciplinary skills and a cross-sector approach are needed, so that all of them have a broad enough knowledge to identify potential issues. They must also know what other members of the supply chain know and where to go to find solutions to any issues that may raise.

2.1.2 Based on an extensive literature review (6) and feedbacks received at workshops 1 and 2 (4, 5), a list of key energy renovation skills and knowledge was developed for the three groups of building professionals defined in 1.2.5.

2.1.3 Skills and knowledge are set at one of four levels for each group:

- Awareness: a person should be aware that specific regulations, issues, concepts, procedures, etc. exist and should also understand where they are relevant or might apply.
- Knowledge: a person, in addition to being aware that a concept, regulation, issue, procedure, etc. exists must also have some degree of knowledge of how it applies and be able to apply it independently at a basic level.
- Understanding: means that the person has a comprehensive knowledge of a concept, regulation, issue, procedure, etc., including how it applies, and can apply it at a complex level.
- Ability / Competence: means that the person can bring all their knowledge and skills to bear in the successful delivery of that particular element of a professional service.

2.1.4 Paragraphs 2.2, 2.3 and 2.4 provide an overview of key energy renovation skills required for each group of building professionals identified in 1.2.5. However, this list will need to be further refined by professional bodies and updated on a regular basis to keep up to date with policy and technology developments.

▶ 2.2 GROUP 1: REGISTERED ARCHITECT, CHARTERED ENGINEER AND CHARTERED BUILDING SURVEYOR

2.2.1 This group is made up of building professionals who can act as design and assigned certifiers under the S.I.9. Building Control (Amendment) Regulations (11). These are registered architects, registered building surveyors and chartered engineers.

2.2.2 Among all building professionals, they are the group which require the highest level of knowledge in relation to energy renovation.

2.2.3 More specifically, they must:

- Be able to practice the principles of sustainability and of sustainable design.
- Have an excellent understanding of the basics of building physics and construction types, including traditional buildings.
- Understand building pathology and be able to diagnose and differentiate sources of damp and moisture.
- Have a good understanding of energy use in existing buildings, energy reduction and energy production (including renewables) solutions, as well as of their interdependencies and effectiveness.
- Be able to assess and manage risks associated with energy renovation.
- Be able to interpret building standards and regulations in relation to energy efficiency and understand Building regulations compliance software.
- Be able to use energy modelling tools.
- Be able to assess buildings for energy efficiency and quality retrofit
- Be able to cost retrofit.
- Have a good understanding of energy management solutions and of post-retrofit, building operation and maintenance.
- Have a good understanding of the value of energy renovation (including its co-benefits) and of the users' needs and motivations.

- Have a good understanding of financing options.
- Have a good understanding of sustainable materials and resources.
- Be able to connect the individual performance to a team performance.
- Be able to communicate and transfer all this information clearly to members of the supply chain, building users and clients.
- Be able to collaborate with cross-trades.

▶ 2.3 GROUP 2: OTHER CONSTRUCTION PROFESSIONALS

2.3.1 The second group is made up of other construction professionals, i.e. architectural technologists, contract managers, project managers, site managers and facilities managers.

2.3.2 These professionals typically work on energy renovation projects as part of a team and as such require a slightly lower level of upskilling in that field.

2.3.3 More specifically, they must:

- Understand the concept of sustainability and sustainable design.
- Have a good understanding of basic building physics, building pathologies and construction types, including traditional buildings.
- Have a good understanding of energy use in existing buildings and of the most common energy reduction and energy production (e.g. renewables) solutions, as well as their interdependencies and effectiveness.
- Have a good understanding of risks assessment and management in relation to
- energy renovation.
- Have a good knowledge (understanding for facilities managers) of energy management solutions, and post-retrofit building operation and maintenance.
- Understand building standards and regulation in relation to energy efficiency.
- Understand the value of energy renovation (including co-benefits) and building users' needs.
- Have a good knowledge of sustainable materials and resources.
- Be aware of retrofit costing and financing.
- Be able to communicate effectively with clients and other members of the construction chain.
- Be able to connect the individual performance to a team performance.
- Be able to collaborate with cross-trades

▶ 2.4 GROUP 3: PROPERTY PROFESSIONALS

2.4.1 This last group is made up of property professionals, i.e. valuers, estate agents and quantity surveyors.

2.4.2 When it comes to energy renovation, property professionals must:

- Understand the value of energy renovation, including its co-benefits, as well as users' needs.
- Have a good knowledge of the concept of sustainability and be aware of climate change targets, as well as their impacts on the real estate market.
- Be able to integrate energy efficiency considerations in valuations.
- Have a good understanding of the cost of retrofit and of financing options.
- Be aware of the risks associated with energy renovation and how to manage them.
- Have a good knowledge of building regulations in relation to energy efficiency.
- Be aware of building physics, building pathologies and construction types, including traditional building.
- Be aware of most common retrofit and renewable solutions.
- Be aware of sustainable materials and resources.
- Be aware of energy use in existing buildings, energy management solutions and post-retrofit building operation and maintenance.
- Be able to communicate effectively on energy renovation with clients and members of the supply chain.

▶ 2.5 SUMMARY

In line with some of the core recommendations made as part of Ireland's national renovation strategy consultation process (3), the framework was designed to allow for closer alignment between building professionals. As described in this section, this means that all construction and property professionals certified under the framework will at the very least reach awareness level in relation to energy renovation skills and knowledge.

▶ CONCLUSION & NEXT STEPS

Almost 90 organisations and individuals have taken part in the ECCoPro consultation process to date – see p. 13. These include Ireland's main building professional bodies, as well as various educational organisations.

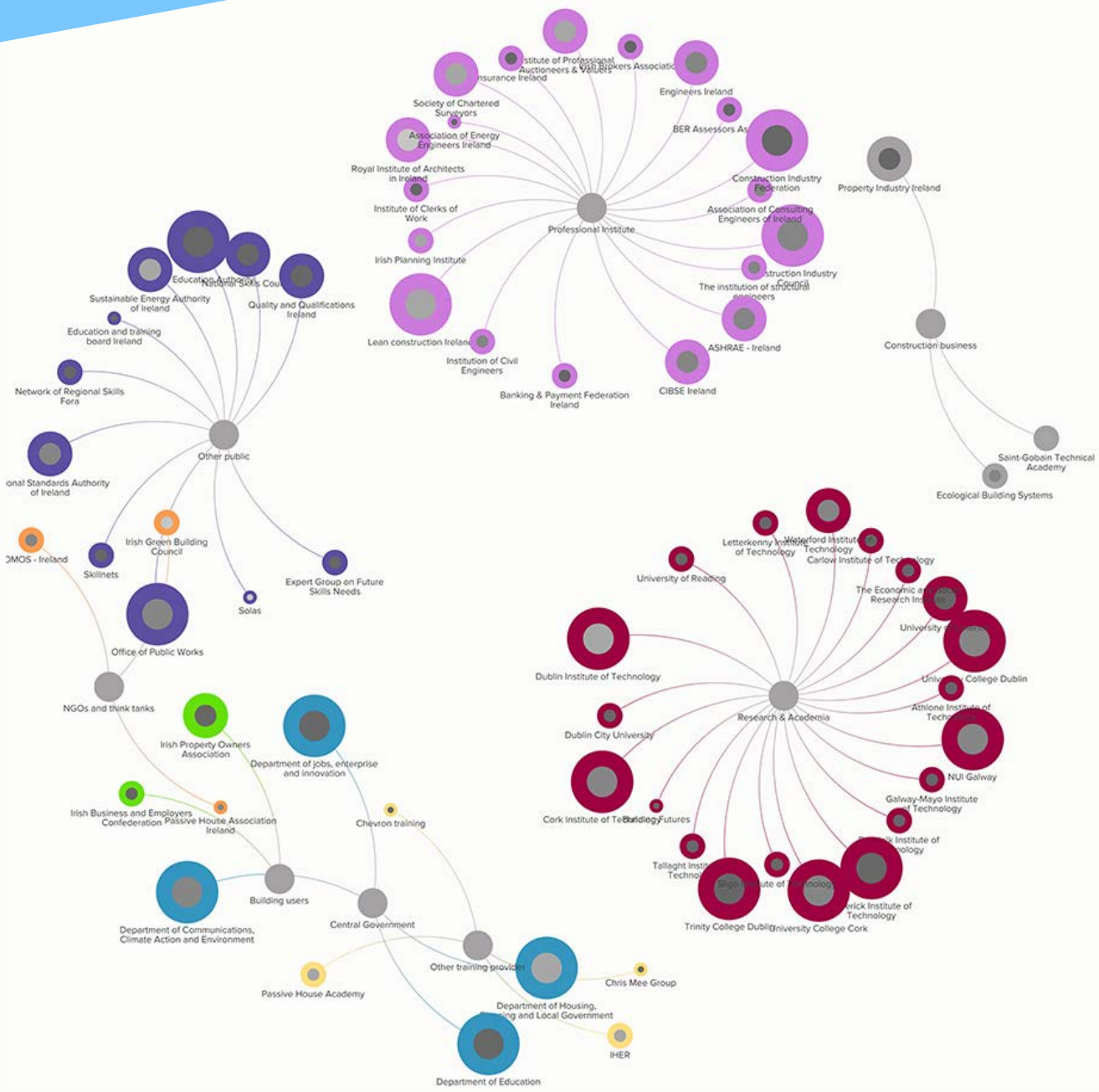
This section sums up our initial set of recommendations for a user-friendly holistic energy efficiency certification system for building professionals:

- The framework must be stable and trusted by all key stakeholders i.e. **users, building professionals,** professional bodies, third level institutions and the Irish construction industry in general. In practical terms, this means that all key professional bodies, as well as a neutral, nationally trusted organisation must be involved in developing and operating it.
- The framework must be kept simple and manageable to create a momentum for upskilling. It is hence suggested to launch it with a single level of certification for each of the 3 groups of building professionals identified (Registered architects, chartered engineers and chartered building surveyors; other construction professionals and property professionals).
- The framework must be designed to allow building professionals to easily identify the skills they are missing to reach certification and how they can acquire them through small incremental steps.
- Prior learnings must be recognised as part of the certification process

In the second phase of the consultation process (January – April 2018), the focus will be on exploring how the framework could be complemented by a user-friendly accreditation system that fully empower users (from individuals who want to retrofit their homes to public bodies and larger organisations who procure work).

Finally, the list of training courses compiled in September 2017 (6) will be further developed to allow building professionals to easily identify steps to take.

As this is still very much a work in progress, interested parties are invited to provide feedback on this document and process to Marion@igbc.ie.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Engineers Ireland
Association of Energy Engineers Ireland
Royal Institute of Architects in Ireland
Institute of Clerks of Work
Irish Planning Institute
Lean construction Ireland
Institution of Civil Engineers
Banking & Payment Federation Ireland
CIBSE Ireland
ASHRAE - Ireland
Professional Institute
Construction Industry Federation
Association of Consulting Engineers of Ireland
Property Industry Ireland
Construction business
Saint-Gobain Technical Academy
Ecological Building Systems
Sustainable Energy Authority of Ireland
Quality and Qualifications Ireland
Education and training board Ireland
Network of Regional Skills Fora
Other public
Irish Green Building Council
Skillnets
Solas
Expert Group on Future Skills Needs
Office of Public Works
NGOs and think tanks
Irish Property Owners Association
Department of jobs, enterprise and innovation
Irish Business and Employers Confederation
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University College Cork
NUI Galway
Galway-Mayo Institute of Technology
Athlone Institute of
Central Government
Other training provider
Other Public
NGO's and think tanks
Professional Institute
Representative body
Research & Academia
Size = Potential to influence the process
Shade = Current involvement in the process

THANK YOU TO ALL THE ORGANISATIONS AND INDIVIDUALS WHO HAVE TAKEN PART IN THIS CONSULTATION PROCESS

ACEI Association of Consulting Engineers of Ireland

AERECO

ARUP

ASHRAE Ireland Section

CIT Institiúid Teicneolaíochta Chorcaí Cork Institute of Technology

Colliers International

Cork City Council

Roinn Cumarsáide, Gníomhaithe ar son na hAeráide & Comhshaoil
Department of Communications, Climate Action & Environment

DIT Dublin Institute of Technology

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

dlr Comhairle Contae County Council

Dutch Green Building Council

ecological Building Systems

Energy Action The Warm Charity

Energy Elephant

Engineers Ireland

An Chomhairle Oidhreachta The Heritage Council

ICOMOS Ireland

iERC International Energy Research Centre

IHER Energy Services Ltd

The Institution of Structural Engineers

ipav Institute of Professional Auctioneers & Valuers

Irish Planning Institute
Institiúid Pleanála Na hÉireann

Knight Frank

Limerick Institute of Technology
Institiúid Teicneolaíochta Luimnigh

LJM

Murphy Mulhall

NICER National Irish Centre for Energy Rating

NSAI

OPW Oifig na nOibreacha Poiblí The Office of Public Works

Passive House Institute

Regional Skills Dublin Partnerships for Skills

RIAI

Rickaby Thompson Associates Architects+ Energy Consultants

Saint-Gobain

Society of Chartered Surveyors Ireland

seai Sustainable Energy Authority of Ireland

sirus Building Energy Solutions

SOLAS An tSeirbhís Oideachais Leanúnaigh agus Sc Further Education and Training Authority

SURECON

sustneo Towards a low carbon future

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GLOSSARY OF TERMS AND ACRONYMS

ACEI: Association of Consulting Engineers of Ireland

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers

Building professionals: Although the literature does not offer a definite list of built environment professionals, a list of professions who should be targeted as part of this project was established. These are architects, architectural technologists, contract managers, site managers, civil and structural engineers, building services engineers, mechanical and electrical engineers, property and facilities managers, building surveyors, clerks of works, valuers, estate agents and quantity surveyors.

CIBSE: Chartered Institution of Building Services Engineers

CIF: Construction Industry Federation

CIOB: Chartered Institute of Buildings

DCCAE: Department of Communications, Climate Action and Environment

IGBC: Irish Green Building Council

IPAV: Institute of Professionals Auctioneers and Valuers

Retrofit: Retrofit is the term used to describe measures undertaken to improve the energy and thermal efficiency of a building.

RIAI: Royal Institute of the Architects of Ireland

SCSI: Society of Chartered Surveyors Ireland

SEAI: Sustainable Energy Authority of Ireland

Users: Users refer to individuals and organisations that may benefit from this framework, i.e. individuals (e.g. owners, tenants, small landlords) who want to retrofit a small dwelling or an office and are looking for trusted advice, public bodies and larger organisations who procure works, as well as investors, lenders and insurers who need to ensure building professionals have the appropriate skills from a risk mitigation point of view.

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Email Us: Marion@igbc.ie

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