Evaluation Report from Superhomes2030 Training Programme

Prepared by: **Electric Ireland Superhomes**

Technological University of the Shannon

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 890492 (Superhomes2030)

Contents

Abbreviations

COP	Coefficient of Performance is a metric of performance of a HP system
CEC	Comfort & Energy in Construction Webinar Series
CR	Croatia
D&C	Dissemination and Communication
DIY	Do It Yourself
EHPA	European Heat Pump Association
EISH	Electric Ireland Superhomes
EPG	Energy Performance Gap
ES	Spain
ESV	Energiesparverband Oberosterreich
FCTA	Fundacion Corporacion Tecnologica de Andalucia
HP	Heat Pump
IERC	International Energy Research Centre
NZEB	Near-Zero Energy Building
RDP	Regional Development Plan
RES	Residential
RINA-C	Rina Consulting SPA
SIE	Sustainable Innovations Europe
SME	Small Medium Enterprise
TUS	Technology University of the Shannon

Background and Context

In order for Electric Ireland Superhomes (EISH) to continue their success more contractors, in-house engineers and retrofit advisors are required. In order to ensure the EISH standard is kept, a training plan is required for in-house engineers, in-house retrofit advisors, and retrofit contractors that join the EISH team.
The EISH process is based off of the SEAI grant funding scheme for retrofit measures, as such the SEAI have minimum requirements for competency of installers of retrofit measures. This clearly states a minimum requirements for any installer that wishes to work with EISH.
Example for Heat Pump Systems, the minimum requirements for installers in the SEAI Grant scheme are:

1. FETAC / QQI Level 6 Advanced Craft in Plumbing
2. Certified Manufacturer training
3. Fetac/QQI Level 6 Heat Pump Systems course or equivalent
4. Registered Electrical Contractor (for electrical works)
5. F-Gas Regulation Compliant (for refrigerant line works)

For those wishing to join the in-house engineering team at EISH they must have one of the following:

- An honours degree (level 8) in a cognate discipline (e.g., Engineering, Architecture, Building Services, Construction Management etc.) or approved equivalent qualification.

- Or A level 7 qualification in a cognate discipline (e.g., Engineering, Architecture, Building Services, Construction Management etc.,) or approved equivalent qualification, with 1-year relevant work experience.

- Or Special Case Registrations: Prospective participants who do not meet the entry requirements above, but who may qualify for admission by meeting certain other equivalent criteria, including workplace experience, should apply to the EI Superhomes to undergo the procedure for consideration.

To further installer and designer knowledge a training plan was created to further develop contractors skills and competencies and was laid out in deliverable D3.5 Superhomes Training Plan and Resources, which outlined:

1. The Contractor Knowledge Hub / Self Learning: This online hub and recordings to contractor webinars are available for contractors to access. This method of delivery was chosen due to contractors preferring to access resources and training outside of normal working hours.

2. Homeowner Resources: Through the Superhomes Website homeowners have access to homeowner guides, best practice case studies, customer testimonies, and recordings of all webinars and events focused at homeowners.

3. The Education Training Board (ETB) and their Near-Zero Energy Building (NZEB) Centres of Excellence: The document includes instructions on how contractors can further improve their knowledge and skills, if required, by attending courses provided by the NZEB centres of Excellence.

4. In-House Engineer Training and masterclasses: Training materials have been created for the purpose of improving the base level of understanding for junior engineers, in particular on heat pumps and NZEB design. To further the knowledge and skills of the junior engineers, masterclasses from senior engineers are proposed to boost the understanding of a particular topic amongst the engineers.

5. The Digital Academy for the Built Environment (DASBE): If required to further the knowledge and skills of in-house engineers, engineers will attend course provided by the

DASBE project, courses include traditional building retrofit design, NZEB design, and retrofit engineering.

Evaluation of Training Programmes

This section outlines the methods and the evaluation of the training programmes used for each stakeholder throughout the lifetime project. Due to Covid-19, training delivery was delayed or was online. This provided plenty challenges, especially with contractors and homeowners that had no access to online events and webinars and those who have poor digital skills. On the other hand, the online experience worked in some installers and homeowners favour as the need to travel to and from locations (and lost time) was nullified.

Contractors

Training Background

From conversations with contractors, on-site training or training at a facility was deemed out of scope, time and the missed opportunity of income were the main barriers for contractors. In order to combat this, it was decided that short online training units were to be created and circulated to Electric Ireland Superhomes contractors and heating and cooling professionals wishing to join the EISH team. A list of leading experts in retrofit, insulation, ventilation, heat pumps and airtightness were invited to present a 20 minute presentation on their knowledge of the sector. This also acted as a dissemination event as all the speakers communicated the event across their channels.
A similar approach was used when offering information to homeowners, short online learnings were used. All training and materials are openly available on the Electric Ireland Superhomes and the TUS Research, Development, and Innovation YouTube page:
(www.youtube.com/channel/UCh4kmrVj3PC73XGn1Ds3jTw)

Training Programme

The 7 hours training was presented by various experts in the field of retrofit, building physics, and heat pumps to give the trainees the most up to date and relevant information available. Those who registered for the training, received the slides, contacts and link to recordings of the training that is openly available on YouTube. There were 282 registrations for the training who were all working in the domestic market and can be further categorised as:

Table 1 Comfort & Energy in Construction Webinar Series Attendance breakdown

Student	Educator	Installer	Designer	Local Authority Staff
6	13	154	75	34

Each of the webinars was recorded and uploaded to the TUS Research Development and Innovation YouTube page and is openly available. To date, there is over 1,800 views across all 14 webinars.
TUS also ran in association with Electric Ireland Superhomes and European Industrial Chillers Ltd. A non-domestic heat pump-oriented event with the main focus on hydronic systems, multifunctional heat pumps, district heating and large-scale heat pump applications. There was a total of 66 attendees, and similar events are planned to continue after the life of the project. This event was not recorded and uploaded due to a request from the speaker. The Attendees of the event can be categorised by the following:

Table 2 Hydronic System Designer Event Attendees Breakdown

Educator	Installer	Designer	Local Authority Staff
3	35	20	8

It was decided not to create a contractor log in hub/portal as part of the Superhomes2030 project. The hub/ web page set up for contractors (https://electricirelandsuperhomes.ie/contractors/) is open to the public. It was decided that there wouldn't be enough exclusive training and a log in hub would involve web development. This may be something to build in the future but it was decided that it would be out of scope at the moment.

Training Programme Evaluation

The Contractor knowledge hub is still being developed, so cannot be evaluated at this time. The contractor training webinar series was a success as it provides a good refresher course for contractors and showcases the other aspects of a retrofit well. However, asking contractors to take a step further and attending an ETB run course proved unsuccessful. The main reasons for not considering taking the ETB run courses, lack of time, too busy with work and lack of interest. The online approach is successful in the fact that it gives the contractor excellent information, however the practical element is lost. One aspect of the EISH retrofit process that provides this practical element is the on-site training that occurs when the retrofit engineer and the contractor are on site together, this day or 2 days of on-site training is not evaluated in this report as it happens naturally in the retrofit process.

Training Programme Recommendations

Recommendations to improve Contractor training programmes and to increase contractor buy-in for training:

1. Incentivise Training: Provide bonuses to contractors that have increased skills through courses and accreditation and communicate to all contractors on the contractor knowledge hub.

2. Training Requirements and Progression Requirements: Introduce training/progression requirements for contractors that have worked with EISH before, similar to the Engineers Ireland requirement for a certain amount of CPD hours throughout the year. This could help increase contractors willingness to attend events and trainings.

3. Masterclasses and Excellence Toolbox Talks: Highlight best practices undertaken by contractors and showcase to other contractors, similar to a train the trainer scheme.

4. Continuous training sessions: Continue the webinar series and dive deeper into each element of the retrofit process and explore new and emerging technologies that will be incorporated into the EISH list of retrofit measures.

In-House Engineers

Training Background

Superhomes engineers have highly technical and project management skills at their core, gained from a combination of higher-level education and work experience. Due to the dynamic nature of retrofits projects engineers must be able to work in a multidisciplinary team, as the projects will involve many stakeholders from homeowners, BER assessors, principle and sub-contractors, fellow engineers, SEAI and the wider Superhomes organisation.

Training Programme

The In-house engineers training programme consisted of providing masterclass sessions by senior engineers to showcase best practice case studies and signposting to The Digital Academy Sustainable Built Environment (DASBE) project & TUS Higher Diploma in Residential Energy Retrofit Management. This higher diploma is made up of 3 special purpose award courses that can all be done individually, each lasting 15-weeks with a blended approach. These special purpose awards include:

1. Certificate in Residential Energy Retrofit Fabric:

2. Certificate in Residential Energy Retrofit Systems:

3. Certificate in Residential Energy Retrofit Management

When a student completes all three certificates, they are awarded the Higher Diploma in Residential Energy Retrofit Management. The aim of the higher diploma is to up-skill building professionals to develop knowledge and skills that allow them to design and deliver high quality, energy efficient retrofitting to existing buildings while complying with Ireland's latest Building Regulations. The course can be accessed here: https://lit.ie/en-ie/courses/certificate-in-residential-energy-retrofit-managem

Training Programme Evaluation

No masterclass session has been conducted to date. This is due to the lack of time senior engineers have, due to the high levels of retrofits being conducted by EISH. There are plans to provide these sessions in the future.
To date, the 15-week certificate Residential Energy Retrofit Fabric was completed between September 2022 until December 2022 and the learning outcomes of the course are as follows:

- Building Physics and Fabric: Modes of heat transfer, thermal Bridging, heat loss calculations, properties of insulation materials, insulation Systems, assessment of fabric upgrade option

- Air Tightness: air tightness membranes, thermal comfort and air quality, moisture management, and designing air tightness solutions.

- Building Defects, Detection and Analysis: Digital Tools for identifying building defects, condition assessment, building fabric defects identification and Analysis for Energy Upgrades, hygrothermal risk evaluation and modelling, U-value calculations, and maintenance and repair.

The certificate in Residential Energy Retrofit Systems will commence in January 2023 and will run until May 2023. The learning outcomes of this certificate are:

- Heating and DHW for residential retrofit: Space heating, domestic hot water (DHW), heating and DHW renovation, policy, and legislation

- Ventilation systems for energy retrofit: Ventilation, ventilation systems, comfort and indoor air quality, ventilation and heating systems relationships, commissioning and testing of systems

- RES Electricity and Smart Buildings: RES Electricity, and mart buildings and system integration

The final certificate, 'Certificate in Residential Energy Retrofit Management' will commence in September 2023 until December 2023 and the learning outcomes of this certificate are shown below:

- Project Management for Residential Energy Retrofit: Introduction to project management, project risk management, project management processes, retrofit health and safety management, quality management strategies, and supply chain management.

- Retrofit Business, Planning and Finance: The business plan process, cost classifications as an aid to decision-making, budgeting and financial analysis, and human resource.

- Circular Economy and Procurement: Introduction to the circular economy for construction projects, introduction to sustainable and responsible procurement in the construction sector, product labelling and certification, introduction to the principles of life cycle assessment, resource, and waste management plans

- Energy Retrofit Project: Research techniques, report writing, residential energy retrofit project.

Training Programme Recommendations

Recommendations to improve In-house Engineer training programme and to increase buy-in for training:

1. Subsidise Training, Training Funding Schemes : Provide the funds for engineers to attend courses, and to recoup the funds, the engineer will be charged small regular instalments from their gross salary similar to the 'Bike to Work' scheme.

2. Progression Requirements: Introduce progression requirements for engineers that have, similar to the Engineers Ireland requirement for a certain amount of CPD hours throughout the year.

3. Third Level Connections: Work with third level institutions to provide Internships and work experience opportunities to third level students and newly graduates.

Homeowner

Training Background

Homeowners will require training on their new heating systems, as retrofit measures such as insulation, airtightness, etc are out of their control. Homeowner heating system training is very important as it ensures that the designed heating system a is working at its maximum efficiency.

Training Programme

TUS has been working with local authorities and the consensus is that a homeowner leaflet is perfect for providing an overview of a system and can get across key messages to homeowners with little to no experience with heat pumps or heating systems. Resources for homeowners will be available on the Electric Ireland Superhomes Website and will include:

1. Videos, Webinars

2. Podcasts

3. Case Studies and Customer Testimonies

A similar approach to the contractor short learning webinar series was decided upon for the homeowner training. This training would be less technical and more digestible for homeowners. The

series included an NZEB presentation from Laois Offaly ETB, a retrofit presentation from another One Stop Shop Envirobead, and presentations from heat pump suppliers on their range of products and how homeowners control and use their heat pump systems. This webinar series gained 119 registrations for the series and an average attendance of 40 at each webinar. The breakdown of registrations is shown below:

Table 3 Homeowner Webinar Series Attendees Breakdown

Educator / Student	Homeowner	Contractor	Designer	Local Authority Staff
17	45	15	18	24

As part of the Comfort & Energy in Construction webinars series, 3 webinars in particular were also orientated towards homeowners along with installers, these being, retrofit management, customer handover and SEAI inspection checks. These webinars provided a clear-cut explanation of the works required to provide a retrofit, the handover process with the installer and the SEAI grant funding inspection checks and common issues seen.

All training and materials are openly available as links on the Electric Ireland Superhomes webpage and are available on the TUS Research, Development, and Innovation YouTube page: (www.youtube.com/channel/UCh4kmrVj3PC73XGn1Ds3jTw)

There were no Podcasts completed to date, this is due to start later in 2023. These podcasts are set to include conversations with customers, installers, designers, and policy makers, and will mainly focus on retrofit management from the perspective of the engineer, installer-customer handover, retrofit policy, retrofit funding and personnel experiences from customers, engineers and installers.

Further to the above mentioned, future webinars and events are planned to take place at the end and after the lifetime of the project. These include but are not limited to the 'multi-homes and multi-block buildings retrofit information series' which is set to take place in February 2023 and March 2023 . This series is being undertaken by TUS and Electric Ireland Superhomes to provide information to multiple building owners like apartment blocks or estates. The event will provide information on the process of retrofitting multiple buildings / apartments and will dive into the financial, technical and economic aspects of multiple retrofits. There are 4 main cohorts that are being targeted with these events,

1. Local Authorities: Local Authorities across Ireland are planning retrofits to multiple units they currently possess, where up to 95% of the retrofit will be funded by the Irish Government.

2. Approved Housing Bodies: Similar to the local authorities only the funding stream is through the Retrofit One Stop Shop scheme where up to 50% will be grant funded.

3. Private Landlords and Building Owners: These may own multiple buildings or singular rented buildings. These again will be funded under the Retrofit One Stop Shop scheme.

4. Corporate Landlords: These building owners are not eligible for funding under the Retrofit One Stop Shop scheme but instead must look for other funding offered through SEAIs other grant schemes such as Support Scheme for Renewable Heat (SSRH) or EXCEED certified grant.

Training Programme Evaluation

The video/webinars is a good method to transfer simple knowledge to homeowners and other participants and also to provoke engagement from the homeowners with leading experts. The bite sized webinars allowed for questions at the end and the presentations were also shared afterwards. The podcasts will provide a similar transfer of knowledge and also a way for EISH to disseminate and grow their business.

The Case Studies and Customer testimonies are received well by homeowners, by showcasing the success of EISH retrofits in multiple building types, building sizes and the level of retrofit required.

Training Programme Recommendations

Recommendations to improve homeowner training programme and to increase buy-in for training:

- Homeowner Knowledge Hub: A dedicated Knowledge Hub for successful applicants of a EISH retrofit, with all the resources orientated towards homeowners and explanations of the reasons why for, the process and the result of retrofit measures.

- Requirement with Retrofit: A requirement for homeowners to view the materials available, before or during the retrofit. The engineer and installer should promote the materials in order to fill in any knowledge gaps that the homeowner might have.