



SUPER STREAMED

GROWING SUPERHOMES SCHEME MAKING DEEP RETROFIT EASY

Home retrofit can be a messy process – an attempt to pull together a disparate bunch of suppliers and tradespeople, often without a clear understanding of how the upgraded building will perform, and of any potential unintended consequences. The streamlined, customer focused SuperHomes scheme is simplifying and de-risking the process for hundreds of homeowners all over Ireland.

Words by Jason Walsh

Everyone understands how a low energy house can be built—in theory at least: a design conscious of thermal energy, high levels of uninterrupted insulation and an airtight building envelope with suitable ventilation, topped-off with the use of renewable energy. What can be more difficult to understand is how existing homes can be upgraded.

Questions facing homeowners include how much can be achieved, what are the right measures to take, how extensive will the work be, and how to find contractors and suppliers who can be relied on. In addition, the thorny issue of how to navigate the often-complex grant aid programme is no small thing.

Tipperary Energy Agency thinks that it has

the solution, and it is working nationwide to prove it: SuperHomes. Frequent readers of Passive House Plus will be familiar with SuperHomes as a deep energy upgrade programme that goes far beyond the traditional ‘shallow retrofit’ approaches of insulating cavities, attics and boiler replacements – an approach evident in the impressive results posted from a monitoring study of heat pumps installed under the scheme.

Central to the programme is to look at houses as systems rather than an assemblage of unrelated elements, something that many people understand when it comes to new builds, but is something of a new frontier when it comes to retrofit – where the risks may be higher, depending on how well the

building was originally built, how it’s been subsequently maintained and what kinds of upgrade works have previously been attempted.

Dave Flannery, specialist in retrofit coordination, customer communications and home assessment for Tipperary Energy Agency says that ‘SuperHomes’ was a way of branding its efforts to make both the national and residential nature of the work clearer.

“We were doing deep retrofit before [but] we wanted to distinguish the residential side of our operations. This was a way of communicating throughout the country that was dedicated to residential retrofit,” he says.

The government’s climate action plan announced in July calls for a minimum of



Opposite Ali Sheridan's family outside their SuperHomes retrofit; **this page, clockwise from top left** Typical measures installed under the SuperHomes scheme include new air source heat pumps, solar PV panels, low temperature radiators and new heating controls; **p77** SuperHomes's Dave Flannery on site during a retrofit.

500,000 houses to be retrofitted to be more energy efficient by 2030, and SuperHomes has the potential to help define the process.

Houses as systems

Flannery says that looking at homes in a holistic sense is central to a serious deep retrofit—failure to do so often results in poorer than expected performance and, worse, serious problems.

"Retrofit has always happened, people have always done that: bought a home and gutted it, increased the insulation, changed the boiler. But a house has [typically] never been seen as a complete system, so carefully planned retrofits haven't happened," he says.

"When you approach, say, windows, people will get advice that the windows need upgrading. When they do so they find that the [only] ventilation was provided through their leaky windows. Suddenly, they're getting black mould around the windows. That's really clear evidence of a house as a system."

For Flannery, one of the key advantages of SuperHomes is that it is not a piecemeal approach. "We say what is required to improve the house in one go. That's our starting point."

"If we look at redbrick or mass concrete, there is a certain thickness, a certain U-value, that you want to achieve, [but] it's not about stuffing in as much insulation as possible. Whether we like it or not, all of the elements of a house interact with one-another and predicting what will happen is a big part of the process," he says.

In this regard, SuperHomes has already been a success as it communicates this message to homeowners who might otherwise be tempted to slowly work on their house, one element at a time, often starting with a new boiler or insulation.

"When you put it in those practical terms people understand it," says Flannery.

From D to A

When sustainability consultant Ali Sheridan and her husband decided to move home, both comfort and wider environmental issues were at the forefront of their minds.

"From myself and my husband's point-of-view, we were quite concerned about climate change and we wanted to build a home that reflected that," she told *Passive House Plus*.

The cost of buying a new home—where virtually all are A2 or A3 rated, thanks to changes to Part L in 2011—proved prohibitive, providing the impetus to look at renovation and energy upgrading.

"We had the choice of trying to find an A-rated house, but we had budget limitations, or finding a doer-upper," she says.

The house that Sheridan and her husband finally settled on, a semi-detached unit in north Kildare within commuting distance of Dublin, met most of the couple's criteria. Except one: it was an energy sink, with a D3 energy rating.

"It was losing heat everywhere and it's not hugely old so that just shows how far the regulations have come in recent years," says

Sheridan.

The work—by specialist retrofit contractor Sola Energy Solutions—included upgraded insulation in the floor, attic and walls, along with triple glazed windows, airtightness work and the installation of an Aereco demand controlled mechanical extract ventilation system. Heating is provided by a Mitsubishi Ecodan air source heat pump, with the house powered in part by a solar PV array.

The upgrade process was more extensive than the couple had expected, but the results were also better. "When we started, we didn't understand the full possibilities of what could be achieved," says Sheridan.

"The level of work you need on a semi-detached house was quite surprising—the whole build took around nine to ten months, including some aesthetic work that we wanted to do." The result, an A2 rating, has transformed the building—and caused a stir locally. "We already see the benefit of it in terms of the quality and comfort," she says.

Sheridan's previous house was also a relatively similar semi-detached home, so the transformation is easy to notice. "It was very cold [and] trying to manage the heat was an issue: you'd come home to a cold house, have to blast the heat then, within an hour, you'd be too warm. It was hitting us in the pocket."

The improvement in terms of energy bills is welcome, but quality of life has also improved in the newly renovated house. "You do feel it [the change]. People notice the air quality. The odour of cooking dissipates so quickly. You'd



hope it's something everyone else could get to experience."

In a sense, the building has become a model for neighbours concerned about endlessly rising energy bills and, often driven by their children, tending to see climate change and energy use not as long-term questions but immediate issues. Given this, the success of the project, and relative simplicity of the funding process, is particularly notable for them.

"There's a constant flow of neighbours coming in to see what it's like. People are interested in the cost savings and energy savings but are probably a bit nervous of the technology."

Nervousness about the complexity of applying for multiple grants is something that SuperHomes helps to deal with, by supporting homeowners throughout the process.

"There's a lot to take in, in terms of the paperwork. Tipperary Energy Agency held our hand on a lot of that and gave us very clear guidelines. They were always on the end of the phone and always talking to our architect."

For Sheridan, the scheme could represent a major contribution to meeting climate change-driven energy use targets: after all, as a typical Irish home it provides a model that can be replicated.

"We hoped to get the house to an A3 but, in the end, achieved an A2. If you think about houses of this scale and all of those in north Kildare and the greater Dublin area, similar upgrades would do a lot for the climate," she says.

Some aspects do raise questions for the uninitiated, both homeowners and contractors, and chief among them is the heat pump, which despite its use in many one-off low energy homes – and its emergence over the last year to outstrip gas boilers as the main heating appliance in new homes – remains a relatively uncommon technology in existing homes.

"A lot of contractors were not comfortable with the heat pump, but if you're going to do this level of work, for me, to go to gas just makes no sense," says Sheridan. "It's about having those wider, longer term conversations." As far as she is concerned, though, the

conversation is happening.

"The benefits are proven. It's just about getting people to understand it and make it a bit easier to achieve – and think about how many similar homes are out there [that could be upgraded] – maybe a million."

Measuring progress

Despite its importance for the industry and homeowners alike, SuperHomes does not chase energy rating figures. Instead, it looks to improve the building as a system, ensuring that it does not leak heat.

"The key thing is the Heat Loss Indicator (HLI)," says Flannery. Calculated using SEAI's Deap software, the HLI is the total amount of heat loss per square metre of a given home's floor area. "The challenge for us is not to get to, say, B2, but to reach the HLI [target] in a way that's affordable and doesn't require huge intervention and disruption for the homeowner. "The BER will follow that," he says.

Flannery says that the scheme, and deep retrofits in general, poses an interesting challenge for the construction sector because much of the work will be bespoke. It also provides an opportunity for lasting growth, though.

"This is an entirely different industry to what [the] construction sector has been used to. Every home is different and there isn't a one-size-fits-all. Even if you take an estate that was built in, say, 1977, if you go in with a one-size-fits-all system it won't work as, over the years, people will have made changes to their homes.

"Even within that archetype you will need bespoke solutions," he says.

As a result, SuperHomes take care to ensure that the right retrofit approach is designed for each and every house – with a SuperHomes engineer visiting to survey the house, and correctly size the heating system, etc. The organisation also maintains a list of approved contractors that are skilled and experienced in retrofits. This is essential because quality control has a dramatic impact on results.

"We've an approval system for contractors that is based on experience and reputation. Where you have a contractor that is approved,

we can work with them more efficiently, and, in terms of pricing, they know what they're doing.

"We spec out the works and the contractor is primarily responsible for the day-to-day works. We do take on new contractors, and we're keen to take on ones who see the value of retrofits," he says.

Contractors that see the value in retrofits will, ultimately, reap the benefit of security. "It [deep retrofitting] will endure a long time past any construction boom," says Flannery.

Given Ireland's recent history of boom and bust, the likelihood of the current housing shortage being met with a building boom that once again topples is something that will certainly be at the fore of many builders' minds, and retrofit is one way the industry can put itself on more solid ground.

Naturally, government targets and support from the likes of SEAI's Better Energy Homes grant scheme will play a role in this, and SuperHomes has a sterling record: Tipperary Energy Agency has a 100% success rate when it comes to grant aid for SuperHomes projects – and over 200 homes completed.

It also uses its knowledge of the funding landscape to ensure that the minimum standards are not only met at both the design and build stages, but often exceeded.

"We would source the best grants for the homeowner and make applications on behalf of them, spec-out the work with that with the grant standard as a minimum, and [then] carry out inspections," says Flannery.

"It could be understood that we project manage the whole thing."

As a social enterprise, Tipperary Energy Agency isn't simply in it for the money, Flannery says. Instead, it sees leading the energy transition in Ireland as its true mission. The reverberations can be felt well outside the Tipperary county boundaries, then.

"That's the core purpose of the agency, but we are run along commercial principles."

In 2019 alone, SuperHomes projects have been carried out not just in Ireland's urban centres, but in counties as far apart as Kerry and Donegal.

"We're in every corner of Ireland. The SuperHomes brand is a way of demonstrating that we work nationwide."