

Passivhaus concept isn’t a load of hot air

Low-energy home defined 30 years ago is still ahead of the times, finds *Arlene Harris*

Parents of teenagers will recognise how irritating it can be when their children take long showers and use up all the hot water. This isn’t a problem for Mel Reynolds, because his four teens could shower for up to one hour and 10 minutes between them before the hot water costs him a cent.

This amazing trickery is down to the fact that not only does his house have an official passive house rating, as monitored by the Passive House Institute (PHI), but it has also just received the first “passive plus” accreditation in Ireland.

Built last year and in the process of being sold, the 120 sq m house in Sandycove is an ultra-low energy house which doesn’t require a primary heating system, yet remains at a constant 21C downstairs and 18C upstairs all year round. There is also an endless supply of hot water and pure fresh air circulating around the property at all times.

As if this were not enough, Reynolds gets up to 10,000km of driving a year powered by the excess energy produced by the solar panels on his roof.

“I was somewhat cynical [about the possible benefits] before monitoring things and I have to say, I was amazed,” says the architect. “But the biggest difference between this house and a regular house is the air quality – it was astonishing to us to have this gorgeous fresh air circulating around all the time. It was a bit like the feeling you get when you breathe in country air and sleep like a log because the air quality is so good.

“Both my wife and my son are mildly asthmatic, so this has been great for them. The temperature is also fantastic. The heating is managed by using the heat from the kitchen and bathroom to preheat fresh air which is coming into the house – so we are getting 100% pre-warmed pure air. It is hygiene-ventilated, which is reassuring during Covid.”

Reynolds says building a house to the PHI standards was marginally cheaper than building a home with an A3 building energy rating, and his energy bills are coming in at a staggeringly low €300 a year. While Reynolds’s house is

at the top end of the scale, architect Darragh Lynch reveals that there are different ways in which to achieve a passive house rating.

“A [generic] passive house uses passive measures to create a comfortable home that uses very little energy,” he says. “This is based on using low-tech, good building practices to achieve good results. It is not clearly defined and there are no specific metrics associated with it.

“The PHI passive house or Passivhaus was defined by Wolfgang Feist, a building physicist in Germany. He was trying to work out what the optimal level of insulation in a house would be and plotted a curve of energy saved against building costs. As he increased the level of insulation, more and more energy was saved, but he reached a point where the cost of the insulation became more expensive than the energy saved because the amount of energy required to heat the house was so small.”

At a particular point the energy required to heat the house no longer needed a conventional heating system, according to Lynch. “This was the point where he set the Passivhaus standard.”

Since then, this standard has been recognised globally and is supported by various research institutes. According to Lynch, based in Dublin, there is no one-size-fits-all method as the certification is based on meeting performance criteria which are tried and tested on site.

“The classic Passivhaus is heated by the operation of the ventilation system. However, in some cases, supplementary heating may be required,” says Lynch.

Tomás O’Leary of MosArt Architecture says the first passive house in the English-speaking world to measure up to the PHI definition was built by his company in Wicklow in 2004. He has been involved in design, delivery and education relating to the PHI-rated concept ever since.

He defines the rating as a “super-efficient energy performance standard”.

“It provides year-round comfort, incredible indoor air quality and tiny heating bills,” he says. “And it’s achieved through doing the basic things really,



really well – so, continuous insulation without breaks, completely draught-proof, no thermal bridges, glazed windows and a mechanical ventilation system which recovers heat from the exhaust air taken from bathrooms and kitchen.”

Although it was developed 30 years ago, Feist’s Passivhaus still exceeds normal building regulations.

“If you build to the PHI passive house standard, you can be sure that your project is future-proofed in terms of efficiency, comfort and indoor air quality,” says O’Leary. “The home we built in 2004 measures 4,000 sq ft and costs just €250 a year to heat. Covid-19 has taught us a valuable lesson in terms of changing the air in our homes regularly, and with [a] passive house, the air is changed multiple times a day and is



Reynolds built a low-energy house, above, and has annual energy bills of €300

Paul McGrath puts up a solid defence for recycling

The former Ireland star reveals why he is happy to tackle environmental concerns with Repak

I was always active when I was younger, so had a general appreciation of my outdoor environment – and I have become more aware of the natural beauty of my surroundings, living in the Wexford countryside for the past number of years. I want to do all I can to do my bit to make sure it stays that way.

How has the world changed since you were a child?

I am from a generation which has seen a dramatic change in the games children play and, for all the benefits of enhanced technology, I encourage children to get out and active in the fresh air whenever they can.

They are being taught about climate change and environmental issues in school, and the work that Repak does helps our next generation play their part in a fun way, which is very positive.

What do you think is one of the biggest advances around the environment in Ireland?

In the past two decades, the Irish public have continually improved their recycling habits, making Ireland one of the most successful European countries for packaging recycling, and we keep getting better.

Do you walk a lot or are you reliant on the car where you live?

I live in the countryside but am pleased to say that I walk more than I drive – I have got in the habit of walking whenever I can.

My good friends Tracey and Pat have a regular 9km loop which we walk – you get to see so much more of the beauty around you, as well as keeping me, and my creaky knees, healthy.

Does climate change worry you?
I feel it’s important to be aware of climate and planet changes, as well as the role we can play in protecting it. Knowing about the Irish public’s packaging recycling achievements – over the past two years Ireland’s packaging recycling tons have increased by 9.1% to 57,000 tons – gives me hope rather than worry, as it shows just how much we care as a nation about our



climate and our planet, and how much we want to protect it.

Has joining Team Green with Repak changed your own recycling habits?
I’m delighted to be a leader of Repak’s Team Green, a role I’ve held now for three years. Protecting the environment is something I’m passionate about and, since becoming a Repak Team Green leader, I’ve become a packaging recycling aficionado.

In just three years, I have really seen the impact that all of us can have on the environment if we make just small changes to our behaviour and come together as a team. I am thrilled, as someone who knows how impactful teamwork can be, to have a chance to encourage the public to do just that.

Over the past few months, we have all been spending much more time at home. I myself have been eating more at home and generating more packaging waste.

It’s now more important than ever to get our recycling right in each household, and I am delighted to have improved my skills in this area.

Clean, dry and loose are three words that are in my mind when I enter the kitchen now.

What colour is your recycling bin?

Because I am in the country, I don’t have a pick-up bin for my recycling. We have a main recycling centre locally, and I take all my recycling there every week.

What’s the one tip you would give people to do their bit for the environment?

I would encourage those who haven’t joined Repak’s Team Green yet to do so. People can join by visiting repak.ie/teamgreen and clicking on the “Join Team Green” button on the webpage. It takes just two minutes to join and you’ll get all the information you need on recycling best practice.

For those who have joined Repak Team Green, I would encourage them to continue recycling correctly and leading by example.

Paul McGrath is an ambassador for Repak’s Team Green, an initiative to educate the public on how to recycle correctly, to help Ireland reach its packaging recycling targets. By joining Repak’s Team Green, people pledge to become better recyclers and can learn tips on how to recycle correctly; repak.ie/teamgreen



Energise your home’s rating with extra layers

Simple steps can help to make your pad more efficient, writes *Arlene Harris*

A building energy rating (BER) certificate measures the efficiency of a dwelling. It covers energy use for heating, ventilation, lighting and hot water, and is calculated on the basis of standard occupancy. Those with a good rating will be energy efficient and have the lowest utility bills.

The rating is based on a sliding scale from A to G – A1 being the best and G the worst. Completed by a registered BER assessor (these can be found on seai.ie, the Sustainable Energy Authority of Ireland’s website), the rating is a necessity for anyone putting their property on the market. However, you don’t have to be selling up to improve your rating.

“A more energy-efficient house is cheaper to heat. It is indicative of a better build quality, is less draughty and is more comfortable,” says architect Darragh Lynch.

“It is also worth pointing out that the BER measures the performance of your building fabric using a universal set of criteria for occupancy, such as hot water use. It is because of this that we are able to compare BER nationally, but it is not

the same as your actual energy usage. Very often your energy habits can save you much more money than insulating your house.”

John Neylon, a consulting engineer and BER assessor, says there are simple ways to improve your BER.

“The first thing to do is to cosy-wrap your house. In the same way as you would put an extra jumper on, you can give your house an extra layer,” he says.

“If you have cavity walls, you can have them pumped with Ecobead cavity fill, or similar. If your house is older, you will need to install dry lining or external insulation. A minimum of 300mm-thick attic floor insulation is also very beneficial.”

The next thing to do is to get rid of open fires and replace them with stoves, Neylon advises. “A stove will significantly improve the BER, as an open fire is 30% efficient compared with the 75% average efficiency of a stove,” he says.

New condensing boilers are 95% more efficient on average and will reduce your heating bills, adds Neylon. “Especially if time and temperature zone

filtered and tempered, making it a much more healthy indoor environment.”

Hugh Wallace, presenter of RTE’s *The Great House Revival* and judge on *Home of the Year*, believes not enough people are considering energy levels in their houses and this is something which needs to change.

“Some 70% of homes in Ireland are below a C rating in terms of their energy efficiency, which is appalling,” says Wallace of Douglas Wallace Consultants. “But new houses have to be built to a very high energy standard. The question is how we refit the million-and-a-half properties that don’t get a B or A rating.”

“My wife and son are asthmatic, so this has been great

The architect says there are obstacles surrounding the retrofitting of homes and a lack of grant support. “To achieve maximum grant aid, you have to go for the maximum A rating,” he says. “That means that a retrofit will cost somewhere between €60,000 to €100,000. The government gives 30% grants, so retrofitting is only for the wealthy. It needs to be for the people who aren’t wealthy, because they’re the ones who will benefit the most.

“I believe they should be going for a B rating. This will, in my opinion, have the most benefit in terms of the level of insulation achieved, the running cost and the benefits to the environment.”

Cost is usually cited as the biggest obstacle to measuring up to a passive house rating, but O’Leary thinks the benefits far outweigh any negatives.

“About five or six years ago, it was quite expensive to get the components needed for [a] passive house, such as triple-glazed windows and heat recovery ventilation,” he says. “But with the arrival of Nzeb, the nearly zero-energy building standard, in Ireland last year, these products are now commonly available and so the cost uplift for building a passive house is negligible. We’ve built several passive house projects that cost the same or even less than so-called normal construction.

“My advice to anyone considering this route would be to do research and find out everything there is to know about it. Seek professional advice from experienced people to see if it is right for you. Building a passive house was the best decision we ever made. My wife summarised it very well recently when she said, ‘Living in this house is like being away’ – and that’s 14 years later.”

mosart.ie; darraghylynch.ie; douglaswallace.com; weswichtu.ie