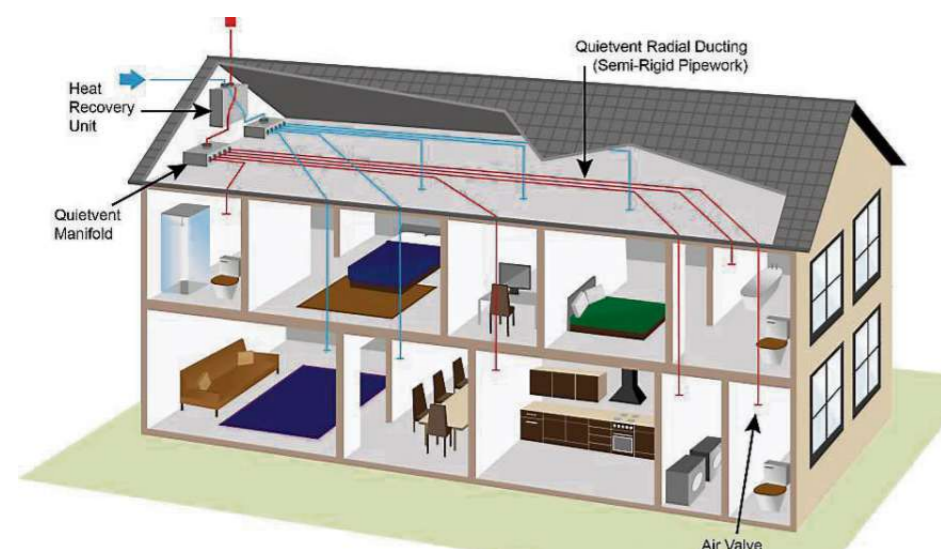


# How to give your home new lungs

**Kya deLongchamps** explores the potential of whole-house ventilation



Above, Blaubeerg single-room heat recovery install and right, fresh air is the single most important element in any living-space. There are ways to improve your situations and HRV retrofit — even to single rooms — are worth consideration.

**N**OW that temperatures are plummeting and rain is drifting by in a blinding cloak, we're blithely sealing ourselves up indoors for another long winter.

The discreet and potentially toxic issue of indoor air quality (IAQ) is something we've talked about before, and the dictum "build tight, ventilate right" has never been more relevant. Now with the prevalence of mechanical ventilation with heat recovery (termed HRV or MVHR) tied to low carbon air source heat pumps in new homes (ASHP) air quality is being addressed as a matter of public policy.

With MVHR, stale air with its odours, allergens and excess humidity is expelled from the home by a continuously running mechanical unit, and fresh filtered air supply is simultaneously drawn in. The outgoing air passes through a heat exchanger sipping back available (heat) energy which can be redistributed to the home. A boost facility allows for rapid extraction of waste air when needed. MVHR is designed to recover up to 95% of the heat normally lost through open windows, vents and other uncontrolled areas.

A holistic approach of deep retrofit with a range of whole house improvements from insulation through to sustainable heat sources has been identified as the way forward in increasing the energy efficiency and sensory comfort of second-hand homes. So, I wondered, what's involved in retrofitting a dedicated ventilation system as seen in new A-rated homes into an existing house? Is it worth the spend, and why would we be prompted to make the change? When is a retro-fit of MVHR as a whole house system truly appropriate? Which rooms should be targeted?

I asked Con Dempsey, general manager at renewable energy technology specialists Clean Energy Ireland, based in Aherla, Cork, to explain. The team is not simply passionate about the firm's proven success but true believers in the crucial place of IAQ both in building new and in improving the quality of life and health in an existing dwelling.

"One of the biggest oversights by many when weighing up whether to fit an MVHR or any mechanical system is that of the health benefits," Con reveals. "There have been numerous studies conducted in re-

lation to air quality both indoor and outdoor. In a 2014 study conducted by the International Energy Agency, it is estimated that the combined health impacts of poor indoor air quality in Europe account for 2.2 million disability-adjusted life years (DALYs) per year. When this is adjusted back to Ireland alone it is costing the exchequer €500 million per year."

Ireland has the fourth highest prevalence of asthma in the world and the third-highest rate of COPD in Europe. Respiratory disease accounts for one-third of emergency hospital admissions and lung cancer is a leading cause of cancer death, 1 in 10 due to radon exposure. "NUI Galway is currently conducting a study, 'Assessment of Ventilation effectiveness via a longitudinal indoor environmental study in A-rated Irish Dwellings,'" Con says.

"The purpose of the study is to investigate the quality of indoor air within homes that have an A-rated building energy rating certification. The results of this study should be available mid to late 2021."

If you do nothing else this weekend, find out more about the work at NUI Galway and direct advice from



Dr Marie Coggins, Exposure Science Lecturer at School of Physics, NUI Galway, on how to improve your IAQ from today, in my recent feature here: <https://www.irishexaminer.com/property/homeandoutdoors/arid-30985655.html>

We're used to wall vents, trickle vents in windows and mechanical fans in bathrooms and kitchens. Why would we vouch for retrofitting modern MRHR rather than winking open existing vents or just popping the windows more regularly?

Con explains: "Retrofitting MVHR may be considered in an existing dwelling for several reasons. Some older dwellings can have mold issues due to a lack of ventilation. This can be particularly prevalent in bungalows as they tend to be more air-tight by design.

If extensive renovation works are being carried out it may also be a good time to examine fitting HRV. (worth noting if extensive renovation work is being carried out you are bound by current building regulations."

"Currently the regulations covering renovations and extensions are set out as all new buildings will become near-zero energy buildings (NZEB) with A-rated efficiency and existing homes undergoing major renovations are to be brought up to a minimum BER rating of B2. Major renovations are classified as 25% or more of the dwelling."

It's unlikely in that case that retrofitting MVHR will be installed in isolation, but more probably during serious and positives improvements. What does Con feel

would make a house ultimately MVHR-ready?

"As a rule of thumb MVHR is most efficient in an air-tight house," Con responds. "It should have no greater than three air changes per hour for MVHR to operate efficiently. The first port of call for sizing up a retrofit MVHR is to carry out an air-tight test."

"The result would inform the homeowner of the suitability of the system."

"The house may not be suitable, but the tester could make recommendations which would improve the overall air-tightness thus decreasing heating cost, air infiltration can account for up to 30% of heat loss."

I wondered how intrusive is the fitting process — where does the unit actually go? Con specialises in the entire project, from de-

sign to handover. "The unit can go either in the attic or inside the envelope of the house depending on space. For servicing purposes, it is easier to have the unit within the envelope, but this is not always possible. Retrofitting to a bungalow or dormer is generally straight forward with a few compromises. Two-storey houses can be a little bit more difficult and would usually be part of a more extensive renovation."

What about cost implications? It's a big, but important spend and in probably in addition to the cost of wider improvements. "The cost of MVHR varies depending on house type and size. Different house types and designs will require different units. An average 200sq m house would be somewhere between €4500 and €5500. The

benefits from an appropriate ventilation system on both the comfort and health of the occupant can far outweigh any costs of installation."

With that sort of spend, single room MVHR is gaining a lot of interest. Single units target the principal problem areas to lift IAQ. What is involved for a standard fit without structural complexities?

Con outlines the process: "A single-room heat recovery unit is a ventilation unit that is applied through the wall and is designed for a one-room installation."

"It works in the same way as the whole house solution, by extracting moist air and supplying fresh air that has been warmed by the heat exchange cell."

and provide a much more energy-efficient solution. Single room units can vary a little on price depending on some added little features. Supply only price (site assessment is vital before ordering) vary between €300 and €500."

So with the system in, what's involved in terms of servicing? Does MVHR simply breathe away quietly for years on end?

"Full-house HRV and single-room units require very little maintenance" Con explains. "Filters should be changed annually at approximately €50 a set. It is good practice to have the unit cleaned every three or four years, this can be a DIY job or done by a professional."

With thanks to Con Dempsey and his team at Clean Energy Ireland, [cleanenergyireland.ie](http://cleanenergyireland.ie)

## Getting to grips with systems



■ If you have mechanical ventilation with heat recovery (MVHR), don't turn it off summer or winter. Your indoor air quality (IAQ) relies on the system's constant use to maintain a healthy environment. Having a house with such a system that's not used consistently could impinge on the IAQ. If the MVHR is excessively noisy have the system professionally investigated

■ Roof windows including Velux Integra (Net-atmo control), can be detailed with ventilation sensors, prompting them to open a small amount to allow stale air, excess carbon dioxide and humidity out. The trouble is that just like leaving a window open for any length of time, any purge or uncontrolled air exchange system costs kW energy to be lost to the house in colder months

■ Demand Control Ventilation (DCV) is an-

other retrofit solution for a clean supply of fresh air to high humidity areas. Nylon strips open and close according to the moisture level in the indoor air, or are activated by motion.

Ducted whole-house DCV with sensors, controllers and fans or individual trickle vents, DCV can be fitted into standard ventilation holes

■ If you're living in a standard "leaky" home with manual extractor fans, chimney flues, windows and trickle vents as your discreet ventilation, ensure vents, fans and any filters are maintained, working properly and free of any debris indoors or out. There should be a number of (draught-free) healthy air exchanges in your home, every day, morning and night. Look for low-noise fans when replacing extractors

## Air purifiers



The HoMedics TotalClean Air Purifier includes three speed settings (Low/Medium/High), replace filter indicators that illuminate when it is time to replace the filter, oil tray with three essential oil pads and a night mode allowing you to turn off the display light during use. Great for a home office, at 11.9sq m of service, €159, Harvey Norman



Dyson Pure Cool Me uses their Core Flow technology to cool and/or just purify the air. The timer can be set for up to eight hours, so you can drift off to sleep cool and comfortable. Focus the airflow by adjusting the dome's position or set to rotate from side to side. The LCD screen shows readings at a glance. From €350, [dyson.ie](http://dyson.ie)

