

ENERGY HOUSE LABS



University of
Salford
MANCHESTER

ENERGY HOUSE LABS NEWSLETTER

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/ WHO WE ARE

The University of Salford's Energy House Laboratories helps businesses understand how effective their products and services are in lowering consumers' carbon footprint and reducing energy bills. Our research facilities include:

- Salford Energy House
- Energy House 2.0
- Smart Meters>Smart Homes Laboratory
- Thermal Measurement Laboratory

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The Energy House 2.0 project is part-funded by the European Regional Development Fund



/ Chris Skidmore MP tours Energy House Labs

On Thursday 8 September, Chris Skidmore MP visited the University's Energy House Labs to hear all about the work we do to improve energy efficiency in the home. He was part of a group on a fact-finding mission from the **All-Party Parliamentary Group (APPG) for the Environment** which is a cross-party group of MPs, Peers, and external members aiming to raise awareness of environmental issues and contribute to policy development.

The team were shown around the original Energy House, a turn-of-the-century terraced house inside an environmental chamber, and heard about the valuable contribution this lab is making towards the retrofit agenda. The tour then carried on to the **Zed House**, a state-of-the-art net zero demonstration home that has been built on campus by Barratt Developments.

The main and final attraction of the visit was Energy House 2.0, the new testing facility building on the successful legacy of the original Energy House. This new lab can accommodate up to four detached houses in two environmental chambers and can recreate virtually any climate. Chris and his party were shown around the two houses that are currently under construction inside Energy House 2.0: eHome2 which is being built by **Barratt** working in partnership with **Saint-Gobain** and The Future Home being built by **Bellway**.



THE GADGET SHOW

Dave Farmer made a second appearance on Channel 5 show, The Gadget Show, on the 22 June. This time, Dave and Jon Bentley measured the effectiveness and energy consumption of air purifiers at the Salford Energy House. To catch up on the episode, click [here](#).

/ Energy House 2.0 Case Study: Progress In Practice

In November 2019, the Energy House 2.0 project hosted its first workshop around energy efficient retrofit. This was a very popular event with 21 delegates drawn from a variety of fields including property developers, architects, and suppliers of retrofit technologies. Hannah Dixon was one of the attendees and at the time was operating as a sole trader as an architect and Passivhaus designer.

“The workshop was quite a turning point for me; I made some really useful contacts which subsequently resulted in some quite significant work for me. I also gained really valuable insights into the practical issues around the energy efficiency aspects of retrofit which has been to the benefit of my designs. It was two days well spent.”

In 2021, with an increasing workload, Hannah established her business as a limited company, **Progress in Practice Ltd**, and now has four people employed in the business, with plans to expand. The company’s current portfolio is predominantly residential, both new build and deep whole-house retrofit, but Hannah sees opportunities for the Passivhaus approach in schools and commercial buildings.

Hannah is a firm believer in a co-design approach, working with clients and the community to achieve the best possible sustainable housing solutions. Hannah is also a founding member of a community housing group, **Manchester Intergenerational CoHousing**, and has recently joined the board of **Greater Manchester's Community Led Homes Hub**.



/ NWRCA success!

On Thursday 21 July, Energy House 2.0 was awarded the Manchester Sub-Regional Project of the Year and Project of the Year - Building at the North West Regional Construction Awards 2022.

The team included:

- Energy House Labs and University of Salford Estates (Client)
- Bowmer and Kirkland (Main Contractor)
- AECOM (Project Management)
- NG Bailey (HVAC Subcontractor)

The awards were held at the Hilton Hotel in Manchester and were designed to recognise the achievements of the construction industry over the last 12 months. The award recognised the unique nature of the project, as well as the significant teamwork in delivering a complex project to budget and time through a very difficult period for the industry.

Director of Energy House Labs, Will Swan, said, “Energy House 2.0 was a real challenge. There was no blueprint for this project, and it required great communication, decision-making and project management right the way through the design and delivery phase. It is an amazing facility and the team have rightly been recognised for delivering something special.”

The project has been put forward for the Building Project of the Year at the National Constructing Excellence Awards taking place on Friday 18 November 2022. We expect this to be the first of a number of awards for a globally leading research and innovation facility.



/ Busy Bees Nursery

Energy House 2.0 was a huge construction challenge, taking two years to complete. During this period, we were lucky to have some very patient and tolerant neighbours.

Directly adjacent to the facility, Busy Bees Nursery has put up with dust, vibration, and probably a certain amount of loud music from builders’ radios, so we thought it would be nice to help them out in return. Having undergone a transformation of their outdoor play spaces and requiring some extra kit, Professors Swan and Fitton helped fund the purchase of some furniture and learning equipment as a thank you. The children can’t wait to see it snow in the chamber (neither can the housebuilders!).

/ Energy House 2.0 Update

The construction of the houses in chamber 1 of Energy House 2.0 is going according to schedule. **Bellway Homes** are building 'The Future Home' and the property being built by **Saint-Gobain** and **Barratt Developments** is known as eHome2. These are both modular build construction with the main structures now complete and both houses are now weathertight. Work continues at a pace with the next phases, internal partitioning, external cladding, and M&E work, now well underway. Testing and research programmes are expected to commence in early December.



/ RUHR SUMMIT

Will Swan from Energy House Labs (EHL) was invited on a delegation led by Andy Burnham, Mayor of Greater Manchester, to the Regionalverband Ruhr. The purpose of the delegation was to discuss potential collaboration opportunities for both regions to explore how they can drive change in a post-industrial era, with EHL invited to share knowledge on projects around retrofit and zero carbon new build. The visit led to the signing of a Memorandum of Understanding between the two city regions to share best practice on climate change adaptation and mitigation, sustainable mobility and transport, digitisation, and regional devolution. This focuses not only on business and trade but also civic, cultural, and educational links.

The delegation visited sites around the region exploring how the Ruhr has responded to the challenge of zero carbon buildings and how former heavy industry sites could be brought back into use, focusing not only on energy but nature-based solutions, place-making, and economic growth. The event ended with a workshop and conference where the invited cities shared ideas and discussed future collaboration.

Will Swan said, "The Ruhr and Greater Manchester have a lot in common. It was a great opportunity to not only promote what we are doing in GM but also see the best practice in Germany. Whether it is demonstration projects or research, both regions have a lot of great activity and some fantastic opportunities for sharing ideas."



/ Emmaus Salford: People's Pod

The Energy House 2.0 team and Rochdale based construction company, **Casey**, have recently been working with **Emmaus Salford**, a local charity, on their 'People's Pods' initiative that will support people who are sleeping rough. The aim will be to upgrade and refurbish site cabins to provide a warm and safe place to stay on a temporary basis.

The thermal properties of a cabin were evaluated in the Energy House 2.0 under winter conditions, with the team making recommendations in terms of upgrading the structural insulation and the heating system to provide a warm and comfortable environment with low running costs.

AEW Architects are currently developing a design for transforming the cabin into a sleeping pod with the refurbishment expected to be completed within the next two months. Lancashire-based **Protectal Ltd**, who have previously worked with Salvation Army on a similar initiative, have also provided valuable design inputs.

Jackie Smith, Business Development Manager at Emmaus Salford, said: "Our first four pods opened in May 2020 and have helped many people off the streets, access support and into more permanent housing. Casey has kindly donated eight more cabins which we plan to refurbish to a high standard, both for the people who will be using them and for the planet. We're delighted to be partnering with the University of Salford and their Energy House 2.0 team to help us develop the specification for a prototype pod."



ENERGY SAVING TIPS!

As the summer ends and the heating season rapidly approaches, many people are starting to consider their upcoming energy bills. Our energy bills always rise over the winter but this year they will be coupled with an upcoming price cap rise of 80% in October, bringing a typical energy bill to around £3549 per year.

Understandably, this is extremely concerning, particularly when it is considered alongside the current cost of living crisis with the Consumer Price Index Inflation figure at 8.8% already causing people's income to be stretched.

Over the past 12 years, Energy House Labs has been researching energy efficiency in homes at the Energy House. Here we have some of the top energy savings advice that is backed by scientific evidence:

1. Loft insulation – the first government backed loft insulation program in the UK started in 1978, and we still have around 32% of lofts in the UK that are not insulated to a good standard. A typical home upgrading their insulation from 100mm to 270mm will save around 6% on the heat loss from their home (1, 1b).

2. Reduction in boiler heating flow temperature – if a combination boiler is installed in your home (generally a boiler that does not have a hot water cylinder) then these tend to work better when not set to their maximum temperature. A recent study at the Energy House found that when the heating flow temperature is turned down from 70°C to 55°C then around 12% less gas will be used on a typical winter's day. An easy-to-use guide of how to do this can be found [here](#).

3. Closing curtains and blinds – some of the thermally weakest parts of a home are often the windows. When we look at a building like the Energy House, a small Victorian end terrace, we find that if curtains are drawn during the heating periods, then we find a reduction of energy usage of around 2% over a typical year (2)

4. Installation of heating controls – the ability to control each individual room in the home presents a great way of saving energy (3). This allows rooms that are occupied a lot, such as the living room, to have a higher level of comfort, and rooms such as halls and landings to have a lower temperature. This can provide significant energy savings when compared to a system that only has a central room controller.

More advanced controls can allow schedules to be added. This allows for rooms to only be heated at certain times, which can be very effective for home workers and families. A simple guide to heating controls can be found [here](#).

5. Carpets and underlays – whilst many people do not buy carpets specifically for their heat retaining qualities, they can make a difference to heat loss through the ground floor of a home. Research at the Energy House showed that when carpets are replaced in tandem with a good quality underlay, this improves the thermal performance of a typical home by around 5% (4).

6. Smart meters – smart meters are now present in well over 50% of homes in the UK. Nobody should be under the impression that they can help save huge amounts of energy; however, they can help in the following ways:

- they can help spot wasted energy, e.g., whether your heating is on when you are not at home
- identify how much appliances are costing to run
- identify whether the things that you are doing to save energy are working

In terms of saving money, smart meters can possibly help here as well. The smart meter installation allows for advanced tariffs to be used; if the occupier is willing to shift energy intensive tasks, such as tumble drying and charging of EVs, then this technology will allow for the companies to charge you less in off peak periods. Some advice on smart meters can be found [here](#).

(1) Swan, W., Fitton, R., Gorse, C., Farmer, D., Benjaber, M., 2017. The staged retrofit of a solid wall property under controlled conditions. *Energy & Buildings* 156, 250–257. <https://doi.org/10.1016/j.enbuild.2017.09.033>

BEIS, 2021. Household Energy Efficiency detailed release: Great Britain Data to December 2020. London. <https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-detailed-report-2020>

(2) Fitton, R., Marshall, A., Benjaber, M., Swan, W., 2017. A study of the thermal performance of tweed curtains under controlled conditions. *PLEA 2017*. pp. 1079–1087. <https://plea2017.net/#programmes-container> (Vol II)

(3) Fitton, R., Swan, W., Hughes, T., Benjaber, M., Todd, S., 2016. Assessing the performance of domestic heating controls in a whole house test facility. *Building Services Engineering Research and Technology* 37, 539–554. <https://doi.org/10.1177/0143624416634070>

(4) Marshall, A., Fitton, R., Benjaber, M., Swan, W., 2018. Investigating the Impact of Renewing Floor Coverings on the Energy Performance of Dwellings with Suspended Timber Floors, Tested under Controlled Conditions. *Sustainable Design of the Built Environment SDBE 2018*. <http://usir.salford.ac.uk/id/eprint/48985/>