ENERGY HOUSE LABS

European Union
European Regional Development Fund

University of Salford MANCHESTER

ENERGY HOUSE LABS NEWSLETTER

ISSUE 3 JUNE 2021

/ 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
- Thermal Measurement Laboratory

/ CONTACT US

If you have any questions email us at energyhouse2@salford.ac.uk or call 0161 295 0073

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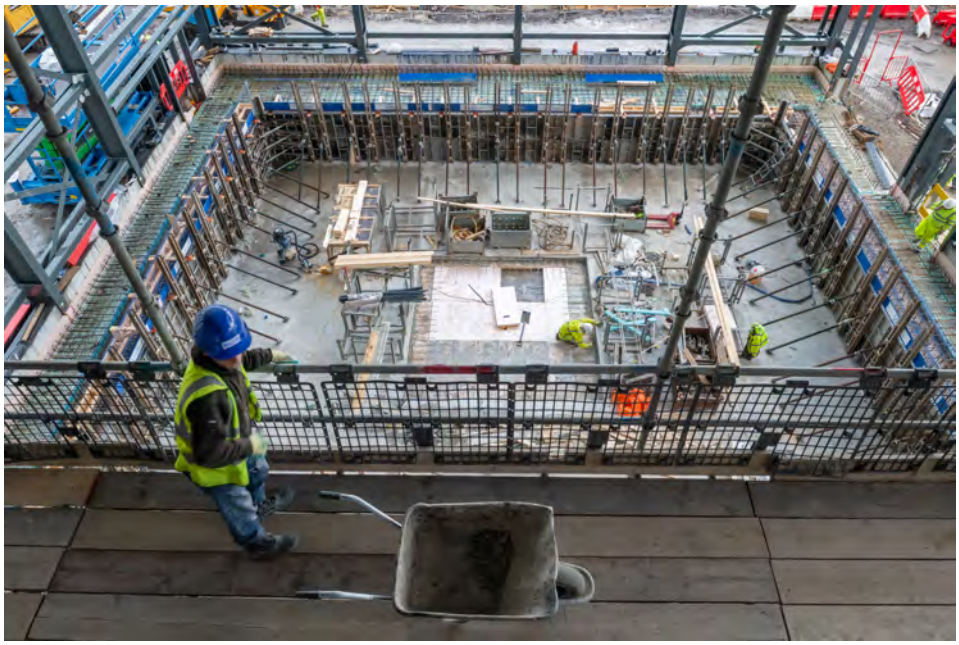
The Energy House 2.0 project is part-funded by the European Regional Development Fund



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/ Energy House 2.0 Research Collaboration

The Energy House 2.0 team are inviting expressions of interest for research collaborations to be undertaken at the launch of Energy House 2.0 in early 2022. The successful teams will be invited to construct a property on one of the four plots and undertake a programme of work that will help inform the future of housing, both in the UK and internationally.

The research collaborations will:

- Construct a house or houses within the chambers of Energy House 2.0
- Identify a programme of research work to be undertaken with the Energy House 2.0 team. This may be a single 3-month project or multiple projects using the same dwelling
- The collaborative partners, who may include multiple companies, are expected to contain at least one Greater Manchester Small or Medium Sized Enterprise as part of the team
- The projects should demonstrate high level of innovation and/ or potential for significant greenhouse gas savings.

Full details of how to get involved are available **here**; informal queries can be made to Professor Will Swan, **w.c.swan@salford.ac.uk**, or Joe Flanagan, **j.m.flanagan@salford.ac.uk**.

The closing date is 17:00 Friday 16 July 2021 with expressions of interest submitted to **energyhouse2@salford.ac.uk**.

/ IGNITION Living Lab Goes Live!

The University of Salford welcomes €4.6 million ground-breaking **IGNITION** Project's Nature-based Solutions Living Lab, as the construction of its second phase is now completed.

Professor Hisham Elkadi, PI and Director of IGNITION Living Lab, said: "We are delighted with the completion of the IGNITION Living Lab. This exciting development at the University campus demonstrates cutting edge green infrastructure technologies and that continue to provide data for further research on hydrology, biodiversity, heat transmission through the structures, as well as how people interact with those installed green infrastructures".

The Living Lab team at Salford is one of 12 leading partners working on IGNITION to deliver evidence to establish innovative ways of financing urban NBS for climate change resilience.

The £1.2 million Living Lab installation has become centre of much attention from the university's research and teaching communities, as well as business investors, green infrastructure (GI) organisations and public alike. The Lab offers tangible solutions for climate crisis mitigation through green infrastructure to inspire businesses and investors to increase their use of NBS, acting as a catalyst for the transformation of existing urban infrastructure to cope with climate emergency challenges.

The installation includes a variety of solutions for green walls, green roofs, rain gardens and sustainable drainage trees, where the scale of experimentation ranges from traditional climbers to patented cutting-edge technologies that push the boundaries of green infrastructure innovation. This allows the project to inform a wide range of stakeholders on investment schemes and raise awareness of the economic, environmental and well-being benefits of GI for communities.

The IGNITION Living Lab was officially launched on 17 June 2021.

Follow IGNITION Living Lab **news** and **virtual tours**
Twitter: #IgnitionGM
Email: **uos-ignitionll@salford.ac.uk**

/ UK-Midwest (USA) Climate Action

Dr Richard Fitton recently presented at the UK-Midwest (USA) climate action.

This online conference was organised by Washington University in St. Louis. The panel discussed a range of topics including the upcoming COP26 conference, how the UK and USA can find synergies to the challenge of global warming. Richard presented the upcoming EH2 project and how this important research asset can be used to develop transatlantic links and research.

Full details can be found **here.**

/ Domestic Retrofit Workshops

Our series of online workshops on retrofitting buildings, part of the Energy House 2.0 project, had a very good initial sign up and exceptionally good attendance on the day.

The initial one-hour session was an introduction to retrofit, with the following four three-hour webinars focusing on key subject areas in the retrofit field:

- PAS 2035
- Measuring Building Performance
- Low Carbon Heating
- Smart Homes

Hosted and introduced by members of the Energy House Labs, the webinars also featured specially curated content from research and industry experts in their field.
The format of the sessions also allowed for a high degree of interaction and Q&A from participants to the relevant presenters and some polling on later sessions which indicated that participants left the sessions with a greater level of understanding on the retrofit specialist area than when they started.

Recordings of the sessions can be viewed **here**.

EHL DIRECTOR JOINS RETROFIT TASK FORCE

Professor Will Swan, Director of Energy House Laboratories, has been invited to be part of Andy Burnham's new Retrofit Task Force. The new talks force brings together both regional and national experts in the field of retrofit to address the role of the existing housing stock in delivering Greater Manchester 2038 zero carbon ambitions. The task force will aim to deliver 61,000 retrofits a year through fabric and heating systems improvements. The need to address the climate emergency is directly linked to the post-COVID recovery, as it is viewed that a growing retrofit market has a potential to deliver high quality local jobs and business growth. These two key issues will see the task force look to accelerate the delivery of retrofit for GM over the coming years, taking a strategic view of skills and finance.

Will Swan said, "The University of Salford has pioneered leading work around retrofit in the Salford Energy House and has made a clear commitment to working with Greater Manchester over the last 10 years. As a team, we see it is vital for Universities not just to be passive observers in the problems and issues of the places where we live, but to get involved and drive change. Our inclusion in the task force is a recognition of both our knowledge, but also our commitment to the city in which we live and work."

Over the last 10 years, the Energy House Laboratories team has worked with Greater Manchester on a wide array of GM focused projects including Green Deal Core Cities, Green Deal Communities, and the current Homes as Energy Systems ERDF project with local social housing partners including Stockport Homes and Northwards.

Will currently chairs the Low Carbon Buildings Challenge Group for GM and led the development of the Retrofit Accelerator.

/ Smart Meters > Smart Homes Lab

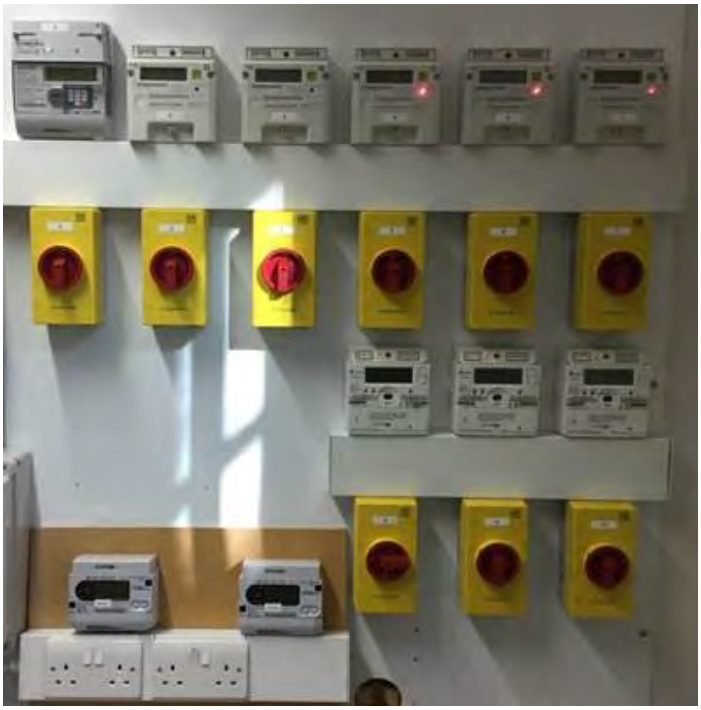
The balancing of electricity supply and demand will become increasingly difficult in the future as we become more dependent upon variable (and relatively unpredictable) generation sources, such as wind. At the same time, as we progress towards Net Zero, electricity demand is expected to rise as it replaces natural gas for home heating and electric vehicles become more common.

Linking internet-enabled domestic appliances with smart meters opens up the possibility of individual households playing a major role in national load balancing. For example, in future at times of peak demand, an electric vehicle could export to the grid through its charging cable or non-essential users such as refrigerators or heat pumps could be temporarily switched off. These actions coordinated across millions of homes could play a major role in national load management and balancing. Combining these technologies with agile tariffs this could also bring major benefits to consumers in terms lower energy costs.

Housed in the historic Joule House on the University of Salford campus, the Smart Meters>Smart Homes (SMSH) facility has been established as a living laboratory to address the research challenges of a smart energy system. The SMSH laboratory comprises a living/kitchen area equipped with state-of-the-art smart appliances, heated either by gas or heat pump, connected PV panels, battery storage and EV charge point. Electricity and gas supplies can be routed via any one of a number of smart meters. Some of the major companies in this field such as Trilliant, Octopus Energy and the Data Communications Company (DCC) provided valuable inputs into the design of the laboratory.

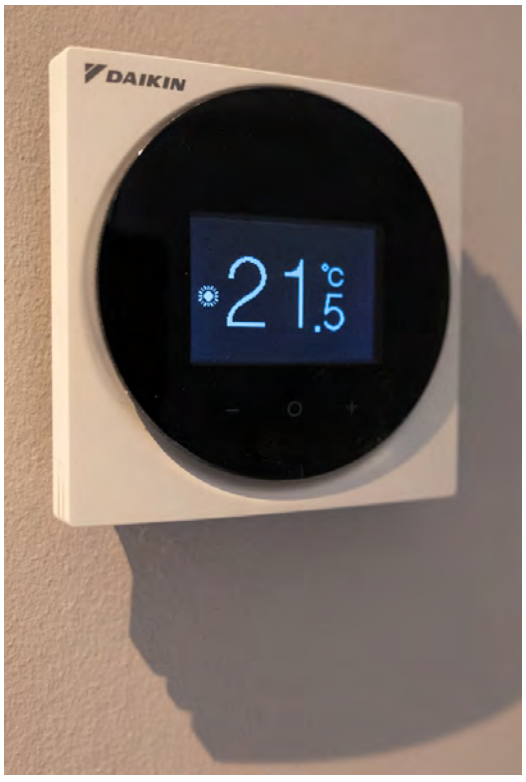
The 'living laboratory environment of SMSH provides an ideal testbed for both smart devices and software with an emphasis on data collection and analytics, combining energy data with other streams such as weather and occupancy patterns. A particular area of interest is the application of pattern recognition algorithms to electricity consumption data allowing automatic recognition of appliances from the electricity meter data stream. This technology has a major role to play in 'Smart Cities' agenda and our work in this area is described in a recent article in the IET Smart Cities journal which can be accessed at **here**.

Our aim is to be a major player the development of the next generation smart energy platforms. We are currently leading a number of commercial research projects and the laboratory has played a major role in the delivery of our Energy House 2.0 business engagement programme delivering workshops and providing one to one support product development support to local companies.



/ The Modular Home Road To Wigan Pier

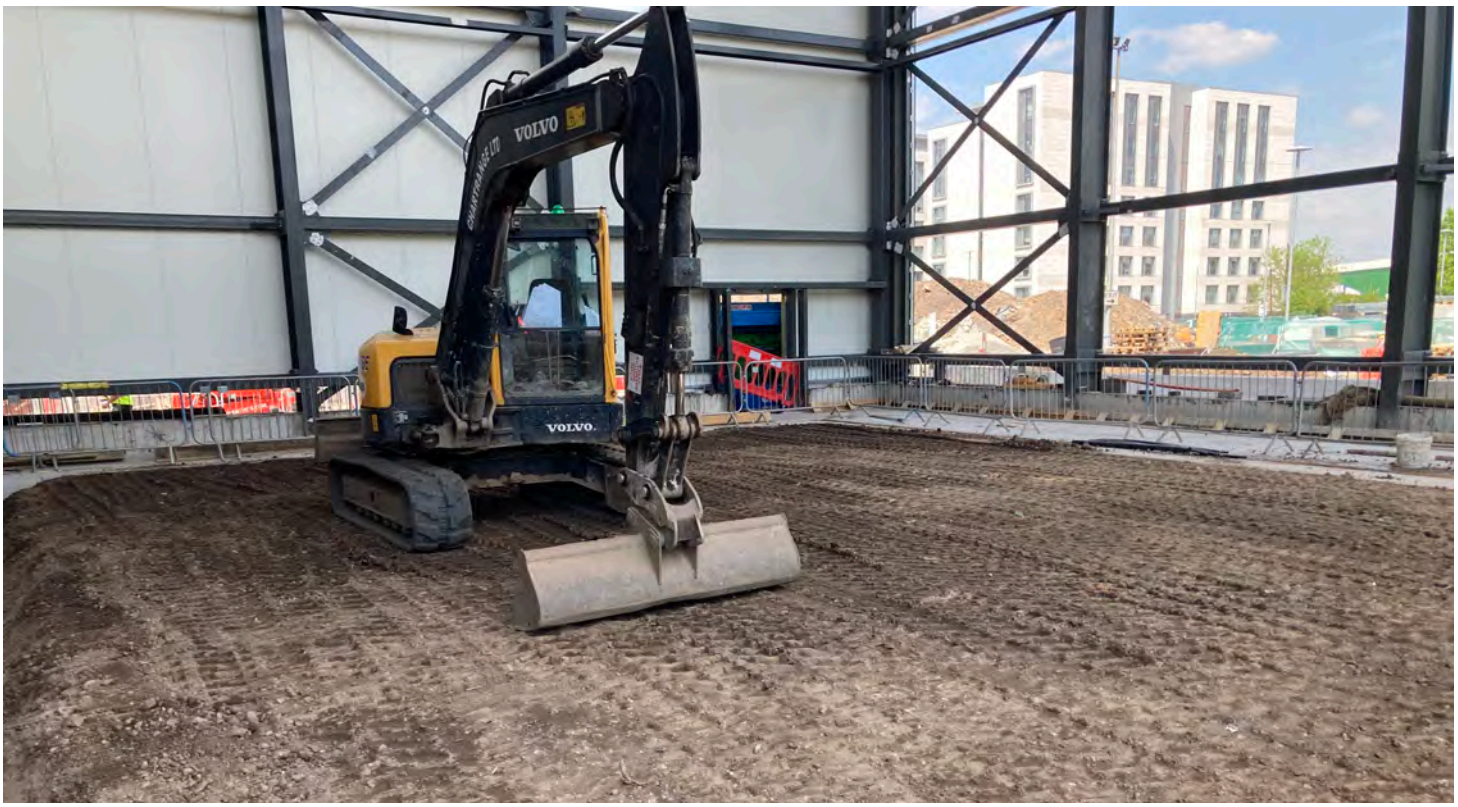
In the drive to build new homes to an exceptionally high standard, including energy efficiency, the spotlight has fallen on the off-site construction of modular homes. These buildings are constructed as much as possible in an off-site factory location, where a skilled workforce is permanently based, and quality can be controlled much more easily. The finished components are then shipped to the final build site for installation and assembly. For example, Sweden is now building 45% of their new homes by this method and the UK is set to increase the percentage of homes it constructs by this modern method. While the quality of construction is higher, how can you assess the buildings performance in the real world as compared to the computer modelled figures?



The answer for Step Places was to undertake some collaborative research with the University of Salford via the Energy House 2.0 project. The University's researchers undertook detailed measurements over a three-week period to assess the buildings actual performance.

Gareth Smith, Director at Step Places said, "The work the University of Salford has undertaken for us at Wigan Pier has allowed us to validate our new design and highlight the areas to improve in an already very airtight shell for marginal improvements in key areas allowing us to use the data collated and be ready for when we roll out our next modular homes scheme in Rochdale later this year".

For more info on Step Places, click **here**.



/ Energy House 2.0 Construction Update

Since the last newsletter, many things have been happening at the site; we now have the full roof on the building and the walls are currently being added, so soon we shall see a waterproof structure.

The testing pits are complete and one is filled with a made-up ground material. Underneath this are the heat flux and temperature sensors that we will use to measure energy transfer into out of the testing pit to allow for a more accurate measure to be taken of ground-based heat transfer for homes.

The HVAC equipment has been delivered to site and work has begun on the installation; much of this is contained in the energy centre to the rear of the building, which is now complete and contains the two large screw compressors that will provide cooling to the facility.

To keep up-to-date on the build's progress, visit **here**.