ENERGY HOUSE LABS

University of Salford MANCHESTER

ENERGY HOUSE LABS NEWSLETTER

ISSUE 12 OCTOBER 2023

/ 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:

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

/ CONTACT US

If you have any questions email us at energyhouse2@salford.ac.uk or call 0161 295 0073 / 0161 295 7165

@ehl_salford

@energy_house2

energyhouse2.com

Prof Richard Fitton explains one of the current projects around heating for refugee shelters to Amanda Solloway

/ Minister for Energy Consumers and Affordability pays visit to Energy House 2.0

In August, Amanda Solloway, Minister for Energy Consumers and Affordability, was given a special tour of Energy House 2.0. Minister Solloway was greeted by our former Vice-Chancellor, Professor Helen Marshall, before Technical Director, Professor Richard Fitton, guided her around our ground-breaking £16m research facility. Also in attendance were key representatives from the Department for Energy Security and Net Zero and partners of Energy House 2.0, including Barratt Development, Bellway Homes, Saint-Gobain, and Vector Homes.

Amanda Solloway was appointed Government Whip (Lord Commissioner of HM Treasury) in September 2022. She was appointed Parliamentary Under Secretary of State (Minister for Energy Consumers and Affordability) at the Department for Energy Security and Net Zero in February 2023.

Since its official opening earlier this year, our award-winning Energy House 2.0 has worked diligently to research and test, in tightly controlled conditions, new ways of powering, heating, and insulating homes, making them more energy efficient and helping to meet new standards which require a significant reduction in carbon emissions for new-build homes from 2025. An outstanding example of British academic innovation, its research has already benefited businesses, not only in Greater Manchester, but across the UK and internationally.

Nathan Feddy, Chief Executive of Vector Homes, welcomes delegates to the Vector Homes Launch

/ Celebrating the Success of Energy House 2.0 Public Tours

We are delighted to share the success of the Energy House 2.0 public tours that took place throughout the week of 4-8 September. We opened our doors to over 700 enthusiastic members of the public, allowing them a unique glimpse into the heart of innovation and sustainability.

Following our successful opening in January, the Energy House 2.0 team was thrilled to welcome members of the public to explore our state-of-the-art £16 million research facility. The turnout reaffirms the growing interest and urgency surrounding sustainable living and construction practices.

During the 30 minute guided tours, our visitors had the opportunity to delve into the intricacies of our environmental chambers. They learned about Energy House 2.0's cutting-edge capabilities and how we are leading the way towards Net Zero homes. Our dedicated team shared insights into the innovative low carbon technologies that are shaping the future of the construction industry.

We would like to thank everyone who attended the tours and share in our vision for a more sustainable planet. The overwhelming response from our visitors underscores the collective commitment towards a Net Zero world, and we look forward to future opportunities to engage with the community.

/ Vector Homes - Prototype Launch

In an exciting event on 21 September, Vector Homes, a pioneering startup based in Manchester, proudly revealed their cutting-edge prototype home within chamber 2 of our Energy House 2.0. This special open day drew in a crowd of 100 attendees, including industry professionals, clients, and partners, all eager to see the innovative design of Vector Homes.

Guests had an exclusive guided tour led by experts, offering a peek into the groundbreaking design concepts, eco-friendly construction techniques, and advanced systems that set these homes apart. Attendees had the opportunity of being among the first to witness Vector Homes' revolutionary home building system, meticulously engineered to redefine sustainable living. These homes are not only equipped with state-of-the-art technologies but also crafted from sustainable building materials, marking a significant stride towards a greener future.

Vector Homes expressed their delight with the event's excellent turnout and the warm reception, stating, “We were really pleased with the overall reception and grateful for all the feedback. It inspires our next development stages”.

/ Net Zero Terrace Project

We are happy to share exciting news about the Smart Meters>Smart Homes Lab's role in the Net Zero Terrace project, which has just been awarded funding under round two of the Strategic Innovation Fund (SIF) competition to address innovation challenge theme two, "Supporting a just energy transition".

The project's main goal is to reduce carbon emissions from heating in terraced properties, especially in communities where opportunities for decarbonisation are limited, by introducing a comprehensive solution called the Smart Local Energy System (SLES). This system includes shared heating through Ground Source Heat Pumps, community-owned thermal storage, solar photovoltaics (PV), and Home Energy Management Systems (HEMS). The beauty of this approach lies in its ability to use energy flexibility services for the Distribution Network Operator, making it both innovative and practical.

Salford University will develop and test the criteria for evaluation of the HEMS providers in the Smart Meters>Smart Homes Lab and aggregate the benefits of thermal performance.

The project will also involve active participation in a local energy market. This will be facilitated through a ledger platform managing Power Purchase Agreement contracts between shared assets and individual homeowners. In simpler terms, it's about creating a sustainable and collaborative energy ecosystem.

This work will be funded by energy network users and consumers through the SIF, a programme from the UK's independent energy regulator, Ofgem, managed in partnership with Innovate UK and key partners will include ENWL, the University of Salford, Northern Powergrid, Urban Chain, Buro Happold, UK Power Networks, Centre for Energy Equality, Rossendale Valley Energy, Rossendale Borough Council, and Kensa Utilities.

For more information, click **here**.

Bill George (centre) receives his award from Professor Darryl Newport (right) and Professor Chris Gorse (left)

/ We are delighted to say that Bill won an award for best paper in the Energy Behaviour and Behaviour Change category at the International SEEDS Conference!

/ Success at the International SEEDS Conference!

Bill George, our newest Salford Energy House Research Assistant, recently had the opportunity to present a Salford Energy House case study on 'Intermittent vs Constant Gas Central Heating Usage' at the International SEEDS conference (Sustainable Ecological Engineering Design for Society), held at the University of Sussex, Ipswich.

Bill said, "As a new researcher attending and presenting at a conference for the first time was an exciting experience. The icing on the cake was engaging with other researchers from around the world. Having my work recognised has given me a huge confidence boost and I look forward to presenting more World leading research conducted here at Energy House Labs. Special thanks to paper co-authors David Farmer, Grant Henshaw, Diyar Alan, Dr Ioannis Paraskevas, and Professor Richard Fitton".

Salford Energy House

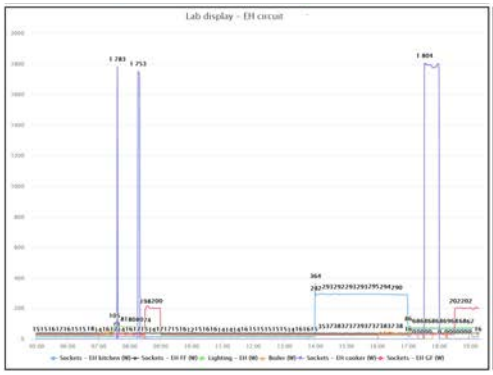
/ Salford Energy House: THOM Project

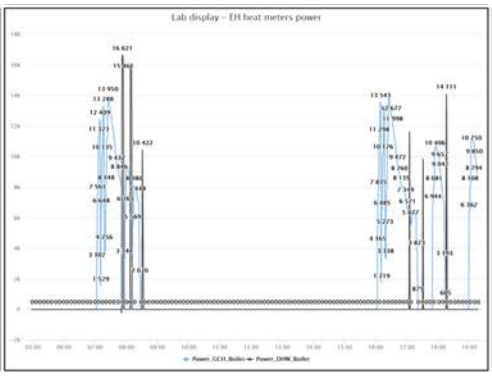
The Department for Energy Security and Net Zero (DESNZ) Total Home Optimisation Management (THOM) project is being undertaken in the Salford Energy House, in collaboration with Chameleon Technology, Evergreen Energy, EnAppSys, and TalkTalk Telecoms. The project will create a heat pump specialist Home Energy Management System (HEMS) supported by a full-package software solution, to help customers understand and maximise the benefits of their heat pumps whilst reducing energy bills and carbon emissions.

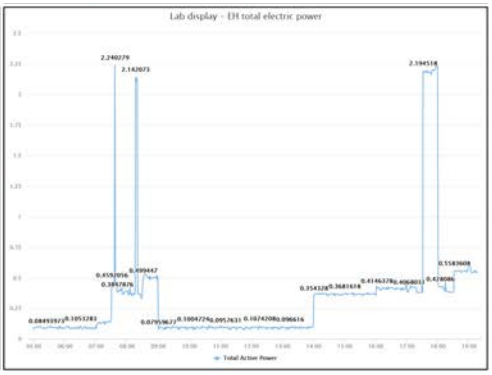
Over the last month, the Salford Energy House automation systems have been put through their paces simulating occupant energy use behaviour inside the house (space heating, hot water use, window opening, appliance use, metabolic gains) while the chamber control systems have been replicating a real-world weather data file outside the house (air temperature, solar gains). THOM analysis of smart meter, in-home display, and broadband data collected throughout this period will be used to assess whether the fabric energy efficiency of the Salford Energy House is suitable for air source heat pump (ASHP) installation. THOM's findings will be validated against separate thermal performance measurements performed by the Energy House Labs team.

These tests will be repeated as the fabric efficiency of the Salford Energy House is incrementally improved, culminating with the installation of external wall insulation. THOM's aim is to identify when the fabric efficiency of the Salford Energy House reaches the point at which installation of an ASHP is recommended. THOM will then be used to assist ASHP sizing and optimise the performance of the ASHP once it has been installed.

Click **here** for more details.







Energy House Labs New Starters

Dr Juan A Ferriz-Papi

Juan is a Lecturer in Building Surveying and the programme director of the MSc Sustainable Buildings at the University of Salford. He has an extensive background in academia, having previously worked at the University of Wales Trinity Saint David (2015-2020) and the University of Alicante in Spain (2001-2013). During these years, he combined teaching with professional work in the construction industry for over a decade. His primary research area is sustainable materials, with a particular focus on circular economy principles and embodied carbon assessment. Currently, Juan is actively involved in a Horizon Europe project (RECONMATIC).

Dr Özlem Duran

Dr Özlem Duran is a Lecturer in Sustainable Construction Technology. After Özlem held her degree in architecture, she worked in practice in companies such as Arup until taking on a researcher role at the Applied Sciences University of Stuttgart, Germany, where she completed her MSc. Özlem was awarded MRes and PhD (2018) at Loughborough University where she also worked as an assistant lecturer. This followed lecturer and senior lecturer roles at Nottingham Trent University and the University of Lincoln. She is a Retrofit Coordinator and a co-founder of CarbonLEAF Consultancy focusing on building performance analysis, and life-cycle carbon analysis. Her expertise area and research interests include energy efficiency, thermal comfort, retrofit, off-site construction, building performance analysis, life-cycle carbon analysis and post-occupancy evaluation.

Dr Chris Tsang

Chris has recently joined us as part of the University Fellowship Programme. Prior to this, Chris was a Research Fellow at Leeds Beckett University, where he played a pivotal role in thermal bridging and energy modelling for the DESNZ DEEP project. Chris holds a PhD in Built Environment from Loughborough University, during which he conducted energy simulations for residential building retrofits in China. His research interests focus on energy efficiency, retrofitting, and moisture resilience. As Chris begins his journey with us, his research will primarily involve model calibration.

Ahmad Wadee

Ahmad is working with us as a research assistant to assess the environmental impact of construction materials and products. Ahmad studied a MSc in Petroleum and Gas Engineering at the University of Salford in 2014–2015 and was delighted with the opportunity to return to the University 12 months ago to work on the Construction Circular Economy Project. In addition to his current role, Ahmad is a PhD candidate at the University of Bath, where he is researching the optimisation of phase change material use to make buildings more energy efficient.

Kelsey Kenny

Kelsey is joining the team as a Project Support Administrator and is thrilled to work closely with the team. Kelsey previously worked at The University of Manchester's Humanitarian Conflict Response Institute, where she handled finance, events and administrative responsibilities. She is truly fascinated by the exciting research happening here, and feels grateful to be a part of it.