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MEDIA RELEASE

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The UK's largest domestic Demand Side Response trial gets off the ground as first residents move in

FLATLINE, an industry led research project aiming to demonstrate the viability of a demand-side approach to energy management at domestic level, has reached a major milestone as residents move into three pilot homes at [The Mill](#) site in Cardiff.

Backed by the Department of Business, Energy & Industrial Strategy, the 'Fixed Level Affordable Tariffs Led by Intelligently Networked Energy' (FLATLINE) project aims to significantly reduce residents' energy bills, using a combination of domestic Demand Side Response and demand shifting for both heat and electricity.

The specially built pilot homes at The Mill development site in Cardiff will be closely followed by a further 46 homes at a separate site, [Parc Eirin](#) in Tonyrefail - which will see first residents move in this autumn as the first phase of the 225 new home scheme is complete.

The project is being coordinated by [Sero](#) which will provide its intelligent home comfort service to the residents, working collaboratively with energy optimisation software developer PassivSystems. A number of other industry partners are involved in the project including Tirion Homes, Pobl Group, Western Power Distribution, Sonnen and Mixergy. The energy partner will be Octopus Energy, supplying 100% renewable electricity and facilitating half-hourly tariffs through their Agile API.

The new residents will be the first to experience using Sero's user-friendly app, which will control the energy network for each home, and intelligently draw, discharge and anticipate energy demands, almost completely avoiding the National Grid at peak times using Octopus's proprietary Agile API, saving money and carbon intensive energy. To achieve this the schemes will use a mix of energy technologies including ground source heat pumps, thermal and electrical storage in the homes, photovoltaic generation and smart controls for residents.

Using residents' preferences - such as their chosen room temperature, hot water needs and overall lifestyle – Sero will forecast energy demands as well as generation using intelligent

software. This will control in-home energy storage to shift the impact of energy demands on the grid, using factors like weather and behaviours, to inform the algorithms that run the systems.

These measures will optimise performance yet be practically imperceptible to residents, apart from through lower energy bills. Through integration of all the technologies into a whole home energy system, it is anticipated that the raw cost of the energy for the homes, excluding management costs, could drop by more than half and therefore drive residents' fuel bills down.

Sero will manage the energy systems of the homes flexibly, through a combination of buying energy at cheaper times and opening up the benefits of grid balancing payments. This will enable energy demands to be effectively matched to grid generation - reducing both carbon emissions and the cost of energy to occupants.

James Williams, Managing Director of Sero, said: "Hitting Zero Carbon requires a dramatic change in our approach to energy and housing. The homes at both The Mill, and then Parc Eirin, will provide a demonstrable blueprint for this agenda - leading the way in showing, at scale, how we can better complement the electricity network as it moves to more intermittent, low carbon energy sources such as wind and solar.

"The FLATLINE concept proposes a win-win-win scenario: flexible and intelligently-managed energy use resulting in significantly lower bills to home occupants - practically eliminating the risk of fuel poverty; electrical demands on the National Grid being shifted entirely off-peak to help support renewables on the grid; all whilst delivering lower carbon emissions in a new UK business model that can lead to growth at home and abroad.

"This demonstration phase of FLATLINE will show the world what we can achieve using the technology we have today, providing a springboard to evidence the viability of this future 'comfort as a service' business model."

Colin Calder, CEO of PassivSystems, said: "Having the opportunity through FLATLINE to demonstrate a whole home energy management solution, bespoke for newbuild homes, has been a great opportunity for us. Seeing first residents beginning to use the intelligent control systems installed at The Mill is a real highlight in our journey to help decarbonisation, and a culmination of many months of hard work. It draws on our extensive expertise of delivering optimum comfort at minimal costs for residents, while reducing the impact on the grid and the environment.

"The government has been challenging home builders to put the environmental credentials of homes at the heart of the design, and FLATLINE provides a real world blueprint for how this could be done."

Phil Steele, Future Technology Evangelist at Octopus Energy, said: "The residents moving into The Mill pilot homes are pioneers in a consumer-led renewable energy system. Using our Agile API, the FLATLINE project will benefit from cheaper, greener energy at off peak times, perfect for sustainably charging a battery and testing out how we can reach net zero faster through consumer level engagement. With more homes to follow, this first phase is just the beginning of a green home transition that is long overdue."

The project is supported by the UK Government's Department for Business, Energy & Industrial Strategy competition for Domestic Demand Side Response. The Welsh Government's Innovative Housing Programme has also supported delivery of The Mill pilot homes and Parc Eirin.

ENDS

NOTES TO EDITOR:-

Media interviews with Sero are available on request, and should be directed to Clare Jones: 07793 382 021, clare@grasshopper-comms.co.uk

About Flatline

The FLATLINE project will deliver typical domestic energy consumers with set price heat and power fuel bills through an innovative integration and management structure between the collaborators' systems. Stable monthly bills will be possible by using a combination of domestic Demand Side Response and demand shifting (for both heat and electricity) across networked districts of homes, operating to control domestic appliances, heating, photovoltaic generations and battery storage in combination. In aggregate across the homes, the energy load will be managed between generation, supply and demand times as well as energy forms, with the goal of achieving a flat line energy demand placed on the Distribution Network Operator and better value to the consumer.

The project is divided into two phases. The completed feasibility phase of FLATLINE has undertaken detailed investigations, modelling and prototyping in order to demonstrate that there is a viable business model that can deliver these FLATLINE goals of very low, fixed bills to occupants whilst providing domestic Demand Side Response services to the grid. The extensive work has included the systems architecture for the management platform, occupant user interfaces, cyber security, underpinning business model rates, legal and regulatory boundaries, and data storage and relevant data rights and protections. This feasibility has also undertaken a pilot site modelling of 58 homes, assessing their detailed energy demands and generation potential.

This FLATLINE phase 1 feasibility report concludes that there is a strong, viable and well-evidenced case to suggest that the FLATLINE project can deliver meaningful Domestic Demand Side Response services to the National Grid, whilst achieving very significant fuel bill reductions to residents, in an economically sustainable business model.

The second phase of the project, FLATLINE's demonstration phase, will then develop the management platform and implement the aggregated system on around 50 new pilot homes in South Wales. These new low energy homes (themselves separately funded to already have heat pumps and photovoltaics) will be equipped with a live trial of the integrated FLATLINE system. The management system will then operate in passive "learn" mode for six months, before switching to full active "management" trial operation, when both performance data and occupant feedback will be collected to inform future progress and the wider potential of domestic demand side response in this format.

About Sero

Established in 2017, Sero is an energy service provider working with developers and landlords of existing homes, offering the UK's first comfort based energy service model simultaneously providing customers with lower energy bills whilst providing domestic Demand Side Response (DSR) services to the National Grid.

- [Sero Projects](#) works with developers and landlords to assist them through the unfamiliar elements of enhancing their homes to include low/zero carbon technologies and enables them to have background smart energy management systems installed. These typically include energy storage, renewable generation, low carbon heating as well as electric vehicle charging.
- Once commissioned by Sero and operational, the residential customer has an opportunity to join the [Sero Life](#) home comfort service. A fixed monthly energy bill based on selected preferences such as their choices of room temperature, vehicle charging requirements and lifestyle. Sero monitors and operate the core systems in the home to deliver these preferences in the most cost or carbon efficient fashion (the customer can choose which), using weather, behaviour patterns and many more factors to inform self-learning algorithms that run the home energy management.
- Sero's model takes the home into an aggregated energy model that accesses half hourly tariffs from strategic licensed supplier partners. Through forecasting and demand shifting, the customer benefits from a lower bill than would be possible with any traditional residential energy tariff (these have flat energy prices throughout the day).
- This complexity is managed by Sero, with the customer simply setting familiar lifestyle preferences that, provided they remain reasonably aligned, gives them a fixed, lower energy bill.

[Sero Homes](#) also builds zero carbon homes that are quality, well designed, larger than typical new build homes set in places that promote community and ecology, and which favour active travel, car sharing and electric vehicles. It is a disruptor in the existing house building market, operating on a purpose-built rental model (currently used extensively across Europe) and will offer long-term, index-linked tenures that provide security and stability, as well as peace of mind over the operation and maintenance of the homes.

Sero is led by Managing Director James Williams, who has considerable experience in the renewable energy markets and development, with Director of Design and Innovation Andy Sutton, an architect and advisor to Welsh Government with considerable experience in zero carbon development. They lead a growing team currently operating primarily in South Wales but with ambitions to expand across the UK.

About PassivSystems

PassivSystems, an award-winning company, has developed a secure, scalable cloud-based 'PassivEnergy' smart home energy management platform for collecting and optimising data collected from smart meters, solar PV systems, batteries and all types of residential heating systems, including district heating. Its smart heating service has been demonstrated to

significantly reduce lifetime operating costs to UK households worth hundreds of pounds a year per household. PassivSystems is the leading provider of domestic solar PV asset management services and its technology has been selected by leading utilities to differentiate their supply services.

The intermittent nature of renewable sources like wind and solar is challenging grid operators to maintain stable electricity networks that can manage both highly variable sources of supply and demand. PassivSystems' vision is that every household can benefit from cheaper, cleaner energy by playing their part in balancing the grid. By developing and operating smart data services that manage equipment in homes, PassivSystems' mission is to create sustainable value from energy systems.

www.passivsystems.com

About Octopus Energy

Octopus Energy launched to the public in April 2016. It supplies 100% renewable electricity and gas to over 1.5 million UK homes. Octopus Energy is the only Which? Recommended energy supplier for a third year in a row, topping the table in 2020. It also recently won Best Utility at the Utility Week Awards. Founded by e-commerce entrepreneurs, Octopus Energy has a different starting point to other suppliers, aiming to redefine what is possible for consumers and the system by using technology and data to deliver the best products and experiences.

Octopus Energy is backed by Octopus Group, a financial services and energy firm, which manages more than £8.6bn of funds. Octopus has invested more than £2.7bn in renewable assets across Europe, while its ventures arm has backed UK success stories like Zoopla, Depop, Secret Escapes and SwiftKey. In April 2020, Octopus Energy became a UK tech unicorn, valued at £1 billion following an investment from leading Australian energy company Origin Energy.

For more information, check out our [website](#).