Department for Business, Energy & Industrial Strategy

BEIS Smart ENergy Savings (SENS) Innovation Competition: Phase 1- Summary of Grant Funded Projects

Introduction:
In the BEIS Smart Energy Savings (SENS) Competition, launched February 2019, project teams could apply for a share of up to £4.4 million in grant funding[1] to develop and trial innovative products and services to deliver additional energy savings in homes through the use of smart meter data.

Competition applicants were required to present products or services that could be offered to households and have a reasonable expectation (e.g. from theory, evidence in other fields, or early piloting) of generating savings additional to those associated with the 'standard' smart meter product (i.e. a smart meter, an IHD and energy efficiency advice delivered by smart meter installers) for domestic customers.

Following assessment and moderation of applications received, 8 projects were shortlisted and awarded funding (through matched grants) for Phase 1 – Development of Smart Energy Savings Products/ Services: project teams to develop their products and/ or services to a state that they can be trialled with households in Phase 2.

The total value of grants awarded for Phase 1 is **£2,159,571.**

At the end of Phase 1, Competition Partners will be required to submit a revised proposal for Phase 2 - to trial their products and/ or services within households according to the trial design (as developed and agreed in Phase 1).

As a requirement of the grant funding, Competition Partners will work with a separately contracted independent expert, the Trial Design and Evaluation Lead (TDEL)- to develop a robust trial for them to implement in Phase 2, with the TDEL undertaking data analyses of energy consumption impacts to evaluate the trial findings. The appointed TDEL is a consortium headed up by Ipsos MORI working with the Energy Saving Trust and the University of Edinburgh.

Separately, BEIS has awarded a grant to the Smart Energy Research Laboratory (SERL)[2], based at University College London, for their provision of energy consumption data from trial households (with customer consent) to the TDEL for their analyses.

[1] Subject to State aid rules. The total budget is £6.25m and includes a programme of monitoring and evaluation.
[2] https://www.ucl.ac.uk/bartlett/energy/research/project-directory/smart-energy-research-lab-serl

Project Summaries:
Competition Partners were asked to provide a public description of their project (which could include describing the project objectives, key deliverables and expected project benefits). The following sets outs the project summary details provided by each Competition Partner successfully selected for Phase 1 Grant Funding, listed alphabetically (by project title).

Project Title	**Combining Gamification with energy insights to create an energy-saving mobile app.**
Competition Lead & Partners	Lead Partner: GenGame Limited. Other Partners: Loughborough University Enterprises Limited, Aprose Solutions Limited, Intelligent Data Technologies Limited.
Grant Award Value	£348,286
Summary of Project-Phase 1	GenGame, Intelligent Data Technologies Limited, Aprose Solutions Ltd and Loughborough University propose to evaluate the effectiveness of combining gamification and energy insights from smart meter data into a mobile app to deliver a step change in engagement and energy savings in UK domestic properties. The project builds on GenGame's IP, software and learning from an Innovate UK supported project investigating behavioural demand side response across 2,000 households in the North East of England, that delivered 11% reductions in peak time electricity consumption using a gamified mobile app. (Ref Newcastle University ACE Project reports https://www.npg-ace.com/) GenGame will leverage their gamification tools and techniques, user centred-design and agile development experience to modify their proposition to target and deliver overall energy savings rather than just peak time reductions, and enhance it with advanced analytics provided by integration with Intelligent Data Technologies' Lucid platform that provides bespoke energy insights, disaggregation and tailored advice based on smart meter data. Smart meter data will be provided by connecting Lucid to the DCC via Utiligroup's ASe-i DCC. This will enable access to information exposed by a range of services applicable to the DCC 'Other User' role - including the provision of consumption data and connection of a Consumer Access Device to provide more granular data, a more engaging consumer experience as well as more accurate insights in selection of homes. Aprose will enable access to DCC enduring test environments and other testing facilities to support end to end testing of connectivity to DCC enrolled devices.

Project Title	**Energising Consumption Data with Alexa**
Competition Lead & Partners	Lead Partner: SENS 2019 Limited (a subsidiary of ONZO Limited) Other Partners: ONZO Limited.
Grant Award Value	£407,341
Summary of Project-Phase 1	ONZO has developed unique technology that analyses smart meter data and turns it into meaningful insights that allow the energy retailer to offer personalised products and services, which greatly benefit the consumer and enable them to reduce their energy consumption. The proposed solution requires no additional hardware to be installed within the home, fully maximising benefits from existing investment in Smart Metering. This service provides energy retailers with a cost-effective method of delivering a service that is focused on energy saving for all of their consumers, without the need for any additional capital outlay. Project Objectives: The main objective of the project is to deliver groups of personalised interventions that help to deliver reductions in energy consumption for residential consumers. Trial participants will only interact with their energy retailer through Amazon Alexa devices. The purpose of the trial is to demonstrate and test that a household can achieve reductions in energy consumption, by utilising technology that is already widely available and affordable across the UK. The proposed interventions are all derived from disaggregation of consumption data. ONZO use a number of different processes and algorithms to build up a rich picture of each individual household by producing a Consumer View of different attributes which enable the delivery of a personalised service to each individual household. ONZO then take certain subsets of those attributes to create interventions which engage with the consumer, clearly illustrating ‘how, when and on what’ they consume their energy and encouraging behavioural change that reduces overall consumption. The secondary objective is to demonstrate the business benefits of these interventions to an energy retailer, in order that they will

	choose to deploy those services at scale to all of their consumers. Without those tangible business benefits, an energy retailer will not make a further investment. These benefits include; reduction in churn, increased NPS scores and reduction of inbound calls. Key Deliverables: ONZO are proposing a series of interventions across multiple categories, to demonstrate the breadth of the ONZO service and its effectiveness in reducing energy consumption for an entire consumer base, not just a limited subset.

Project Title	**IDEAS (Intelligent Digital Energy Advisory)**
Competition Lead & Partners	Lead Partner: Eliq Limited. Other Partners: Bristol Energy Limited.
Grant Award Value	£229,897
Summary of Project-Phase 1	Intelligent Digital Energy Advisory Service – IDEAS – is a collaboration between Eliq Limited and Bristol Energy, with the Centre for Sustainable Energy as subcontracted energy advice partner. The aim of the project is to develop and trial intelligent software, which uses smart meter and home profile data to create personalised energy advice. Consumers are matched with the most relevant advice for their home and circumstances, and the advice is personalised based on smart meter data and motivations, then delivered to customers through a mobile app. A key aspect of this project is a self-learning algorithm, which will select the most relevant advice for each home and the personalisation of the incorporated content, as well as adapting the style and tone of such messages using customer segmentation data. The consortium brings together a range of skills in development of innovation services. Eliq has extensive experience from building digital products that provide consumers with feedback on their energy usage. The company released its first energy consumption web portal and mobile apps in 2011 for the Swedish smart metering programme and today provides apps and web portals for consumption feedback, billing and self-service to 15 utilities internationally, including four UK energy suppliers with a total customer base of over a million. Bristol Energy is a national energy supplier that is a force for social good. Bristol Energy has over 170,000 residential meters on supply nationwide (July 2019) and is growing quickly. Bristol Energy invests in the development to support the decarbonisation of the UK energy system. At the heart of its customer-centric ethos is accessibility and inclusiveness. This project aims to ensure consumers with a variety of backgrounds & circumstances benefit from smart technology. CSE is a national charity that helps households and communities take action on energy, alongside undertaking research and

	analysis to inform local and national policy. CSE has provided independent home energy advice services for more than three decades and employs a team of expert professional advisors, who help about 12,000 customers a year, adapting approaches to client needs and circumstances. CSE also hosts a home energy advice website (www.cse.org.uk/advice) providing extensive existing advice fact sheets and videos to help people save energy, money and improve comfort of their home.

Project Title	**More Effective and Efficient Thermal comfort with Smart Meter Data (MEETS)**
Competition Lead & Partners	Lead Partner: Lightbulb ES Limited (trading as Igloo Energy Supply Ltd) Other Partners: Built Test Solutions Limited, University College London Energy Institute.
Grant Award Value	£236,836
Summary of Project-Phase 1	At Igloo Energy we are developing a new business model that breaks the link between profit and volumes of energy sold, instead concentrating on the provision of energy services to our customers. To this end we have been developing systems that can analyse energy, property and household data and identify opportunities for energy saving. We have also been working a strategy to engage our customers in the most effective manner and provide an end to end service that removes the hassle of managing their energy use. In collaboration with the UCL Energy Institute and Build Test Solutions, the MEETS project will focus on opportunities around the control of heating in the home. The project will use smart meter data, in combination with Igloo's existing data platform develop new algorithms that identify those who will benefit most from new control technologies. Real-time analysis of smart meter data will be used to coach our customers on their heating controls in order to help them use their heating as effectively as possible in order to be comfortable in their homes while minimising energy use.

Project Title	**Proving domestic customers with tailored social comparison and smart energy savings advice in near real-time via an on-line tool.**
Competition Lead & Partners	Lead Partner: Element Energy Limited. Other Partners: Accent Marketing and Research Limited
Grant Award Value	£183,326
Summary of Project-Phase 1	Smart meters are being widely deployed to residential customers across Great Britain creating valuable new opportunities to help households engage with their energy use and to achieve energy savings. These can be realised by providing more meaningful feedback to each household on their energy consumption and tailored advice on energy saving opportunities that are relevant to their specific circumstances. In recent work, Element Energy has developed an online tool that is able to provide households that have a smart meter with near real-time social comparison feedback on their electricity consumption (i.e. how their current consumption compares to the historical consumption of similar households at that specific time of day and season) along with tailored energy saving advice. Recent studies have shown that social comparison feedback is able to deliver energy savings as high as 6%[3]. In Phase 1 of this project, we will build on our existing web-based (and mobile friendly) tool to provide a wide-ranging package of energy saving interventions for domestic customers. Work in Phase 1 will include expanding the range of tailored energy saving advice provided to include estimates of the potential energy and cost savings available from installing various energy efficiency and renewable energy technologies (specific to the household's smart meter data and other characteristics). We will also investigate opportunities to expand the tool's near-real time social comparison functionality and energy saving advice to include gas consumption. In this phase of the project we will also add other complementary interventions to the tool including regular summary emails, the ability to schedule reminders relevant to different energy saving measures and to assist with energy monitoring and budgeting, guidance videos and links to reputable external organisations for additional information. We will also undertake small-scale piloting and user-

[3] P. Dolan and R. Metcalfe, (2013). "Neighbours, Knowledge, and Nuggets: Two Natural Field Experiments on the Role of Incentives on Energy Conservation", London School of Economics and Political Science.

	testing to optimise the tool for user-friendliness.

Project Title	**Smart Energy- Smart Thermostat (SEN-ST)**
Competition Lead & Partners	Lead Partner: Green Energy Options (GEO) Limited Other Partners: Hudson Energy Supply UK Limited
Grant Award Value	£300,000
Summary of Project- Phase 1	According to a 2018 report from YouGov[4], 6% of UK households (1.7 million homes) own a smart thermostat, making it the second most popular smart home technology behind smart speakers. The main factors contributing to this market success are not just the convenience of controlling heating and hot water, but also the cost savings delivered by smart thermostats through more sophisticated control (e.g. “away mode”, weather compensation, etc.) which are generally estimated to be around 12.5%. Given that space heating and hot water account on average for 66% and 17% of total domestic energy use respectively, this is a very significant benefit to consumers and the environment. Surprisingly, the current generation of smart thermostats is completely unaware of the energy used or its cost. In the absence of real energy data, smart thermostats typically use the amount of time that they are “calling for heat” as a proxy for energy used. For example, one of the leading products in today’s market, provides users with a bar chart view showing how many hours the system was asking the boiler to provide heat, labelling this (incorrectly) as “Energy History”. Especially with modern modulating boilers, the number of hours the boiler is on is a poor proxy for the amount of energy used – in fact, if operating efficiently the boiler will be on for much longer than if it is running for short bursts at a much higher temperature setting. And clearly, without an understanding of how many kilowatt hours are used, the current smart thermostats cannot provide users with information on how much is spent. The purpose of the SEN-ST project is to develop and trial a truly “energy-aware” smart thermostat, delivered as a bundled, cost-effective solution that also includes a SMETS-compliant in-home display. With apps for iOS and Android, voice control via Amazon Alexa and Google Assistant, and a simple user interface on the

[4] http://campaign.yougov.com/rs/060-QFD-941/images/YouGov_UK_2018_08_smart_homes.pdf

	display device, it provides the consumer with unparalleled understanding of their whole home energy consumption as well as control over their heating and hot water. Because space heating and hot water account for most of a typical UK household's energy consumption and spend, the actionable insights provided should enable consumers to achieve significant savings. The other unique feature of the solution is that it can be installed by a smart meter installer during a smart meter installation visit, significantly reducing the cost of providing a smart heating solution to the consumer (compared to the typical retrofit approach requiring a separate installation visit). This radically changes the return on investment equation for energy retailers interested in providing smart heating as a value-added service as a way to attract or retain customers, and is thus likely to accelerate adoption, with its associated environmental and economic benefits. Here, any activities will be conducted in line with the Smart Meter Installation Code of Practice (https://www.smicop.co.uk/).

Project Title	**Smart Energy Savings (SENS) through Switchee**
Competition Lead & Partners	Lead Partner: Switchee Limited
Grant Award Value	£347,729
Summary of Project-Phase 1	Switchee is a supplier of Internet of Things (IoT) devices and analytics to the social housing landlord market. Our products are based on smart heating controllers that reduce residential energy consumption in an automated way. This project aims to further enhance the energy saving capabilities of our devices by combining smart meter data, weather data and building performance data, allowing the resident to make simple but informed decisions. Our aim is to be able to inform a resident about how much their heating is forecast to cost them the following week and allow them to make informed adjustments to their heating schedule. The aim is to develop algorithms that would allow us to display a message on the Switchee screen or app. For example, “Last week you spent £22 on your heating. Next week is forecast to be colder and it will cost you £5 more to maintain the same level of comfort. Would you like to reduce the temperature in your home by 1deg to maintain spending at £22? Yes / No.” Project objectives: • Deliver and trial innovative products/services to deliver additional energy savings in homes through the use of smart meter data; • Increase residential energy efficiency and reduce domestic energy demand; • Ensure that solutions are attractive and valued by customers. Key Deliverables: • Development of Smart Energy Savings products/services: GEN 3 CAD and resident application; Expected Project Benefits: • Delivering energy savings / net reduction in household energy consumption • Contribution to Fuel Poverty Reduction • CO^2 reduction • Empowerment of consumer through sense of control over energy use, bills and indoor environment

	• Greater consumer understanding of energy use and energy markets.

Project Title	**Smart Local Energy Markets with Smart Meters**
Competition Lead & Partners	Lead Partner: Energy Local CIC Other Partners: Repowering Limited, Connected Response Limited, TMA Data Management Limited, Octopus Energy Limited.
Grant Award Value	£106,156
Summary of Project- Phase 1	Smart metering offers the potential for domestic customers to have an active stake in the electricity market, to improve energy efficiency and comfort and save carbon emissions. However, to exploit this opportunity and to use them to their full potential, we need to develop suitable business models and supporting technology and IT systems to take these to scale. Energy Local CIC is developing Energy Local Clubs to deliver additional benefits of smart metering by creating local markets for renewable generation and flexibility in household demand. It benefits suppliers, generations and communities. A key element to the business model is smart metering. Phase 1 work will cover: 1. Developing supplier internal processes and/ or software to deliver Energy Local at scale. Understand the value stack of Energy Local to a supplier; 2. Working with suppliers and developers to develop an offering for new generation as a package with a long-term Power Purchase Agreement (PPA) and Energy Local customers signed up to provide additional income to generators; 3. Working with suppliers and developers to develop a suitable package of improved heating control, interface and tariff to benefit those with electric heating, with or without an Energy Local Club; 4. Work with partners to develop the new packages for those in danger of fuel poverty. This is to ensure those that need it most can participate in Energy Local and benefit from better electric heating control; 5. Refine the technology required for all of the above; 6. Find suitable participants to test those which are feasible and (working with the Trial Design and Evaluation Lead) decide how to demonstrate and evaluate them in phase 2. This includes human response, social and environmental benefits as well as economic.