Department for Business, Energy & Industrial Strategy

BEIS Innovative Domestic Demand-Side Response Competition

Summary Projects Details (Phase 2)

- Demonstration projects;
- 13 projects;
- Total value of grants awarded: £8.57 million

Lead Company	Partners	Project Title	Brief Project Description	Grant Award
The Society for the Reduction of Carbon Ltd (Carbon Coop) Carbon Co-op	Megni Partnership, EV Parts Ltd, Great Places Housing Group Limited, Regen SW	OpenDSR	A partnership led by Carbon Co-op will deliver 'OpenDSR' a project assessing the feasibility and demonstrating the real-world potential for an open source, standards-based approach to a demand side response (DSR) management service. This project demonstrates controllable, flexible demand in real domestic environments, with the potential to reproduce such an approach at significant scale, via replication through the UK's widespread existing Community Energy sector.	£346,480.18
Energise Barnsley Limited Energise Barnsley	PassivSystems, Oxford Brookes University, Northern Powergrid	DSR for homes with air source heat pumps in Barnsley	The Barnsley Domestic Demand Side Response (DSR) project targets new build properties (Code 4 Sustainable Homes) with already installed dual purpose air source heat pumps (ASHP's) and solar PV, and adds a smart battery and control system, to generate analytical household energy demand data, which in turn, will form the basis of a demand side response commercial model, benefitting tenants, national grid and the wider low carbon community. A second set of homes built post war and fitted with dual-purpose air source heat pumps will provide an additional	£633,029.01

			subset of analytical data to test the DSR model.	
Energy Local CIC	NFPAS Ltd, Megni Partnership, De Montfort University, SP Energy Networks	Flexibility through Communities	The project enables communities to offer demand flexibility and to be rewarded for participation. Key elements are already in place in a pilot community of 100 households. This includes half-hourly settlement metering, time-of-use tariff, personalised web pages to help users match their demand to local generation or lowest tariff, back-office calculation of tariff and savings from local renewable power.	£243,626
Evergreen Smart Power Limited	Swansea University, MyEnergi, Energy Systems Catapult	The FRED Project (Flexibly Responsive Energy Delivery)	The project investigates and maximises the capability of grid services for domestic loads, focusing primarily on electric vehicle charging and electric heating (immersion heaters and heat pumps). Loads are managed using MyEnergi's Zappi and Eddi hardware. These devices control energy loads and are capable of both autonomous action on detection of signals from the grid and receiving commands sent remotely. The devices are registered within Evergreen Smart Power's Virtual Power Plant (VPP) software which optimises power usage to enable participation in grid services.	£940,509.17
GenGame Ltd	EnAppSys, Ecotricity Group Limited, DuckDuck Ltd, Teesside University, University of Newcastle upon Tyne	Nudge Nudge, Switch Switch	The project evaluates the potential for a holistic approach to domestic demand-side response. It investigates whether state-of-the-art techniques in digital marketing, consumer mobile application development, big data analysis, IoT technology, behavioural science and gamification can be combined to deliver a massively scalable and repeatable approach to deliver cost-effective DSR in the UK.	£765,548

Green Energy Options (geo) Ltd geo	Upside Energy Ltd, Cambridge Energy Group Ltd, UK Power Networks (Operations) Limited, Housing Associations' Charitable Trust, Everoze Partners Limited, EDF Energy Customers Limited	Core4Grid	Core4Grid connects active households with the emerging new energy service supply chain. It provides end-to-end case studies of domestic DSR market operation and consumer acceptability. The project installs an integrated DSR system as part of the fabric of the home, and therefore paid for via the mortgage or rent – as happens with a heating system. Furthermore, the specific focus of this project – the grid signal module – enhances the savings by accessing grid balancing revenues. The aim is to deliver a home with an energy bill that is half that of an equivalent standard home. Such homes, called 'Hybrid Homes' are cheaper to run – and to build, directly addressing the affordable home challenge.	£999,810
Greater London Authority SUPPORTED BY MAYOR OF LONDON	Element Energy, Moixa Technology Ltd, Repowering London, UK Power Networks	Home Response	Home Response demonstrates how electrical hot water heating and solar PV with battery storage technologies can be used in social housing to help Londoner's cut their energy bills, financially reward flexible use of energy, reduce emissions and contribute to a smarter, cleaner energy system for London. By using innovative business models and customer engagement approaches, combined with controlling when and how hot water heating and batteries are used, the project team aims to supply 0.5MW of additional, flexible electrical power to local and national electricity networks by December 2020 – increasing low carbon electricity capacity and improving security of supply to meet Londoners' variable demands for power, i.e. at peak times of the day.	£927,841.59

Levelise Limited	Baxi Heating UK Limited, Ecuity Consulting LLP, Durham University, Engenera Renewables Limited, Energy Systems Catapult	Ubiquitous Storage Empowering Response (USER)	The project seeks to widespread the prosumer role in the domestic sector by means of AI-led hot water tanks. Currently, there are 9 million hot water tanks, which if appropriately managed, represent realising a 27 GW demand response latent opportunity. Through addition of communications infrastructure, sensor technology, AI-led optimisation services and consumer settlement infrastructure, these hot water cylinders could be cost-effectively turned into grid-interactive water heaters. The water heater can be set to run using the electrical immersion heater during periods of excess supply on the national, district or local electricity system, and release the heat when required. Through aggregation of domestic storage assets, grid services could be provided by hot water systems, generating revenue for the consumer and delivering benefit for the energy system.	£658,226.37
Mixergy Ltd	REstore N.V.	Flexible Energy Efficient Tanks (FLEET)	The project proves the viability and scalability of a domestic DSR service involving intelligent hot water tanks in the UK, deliver a responsive and reliable DSR capability whilst reducing energy consumption; a feature which is enabled through the novel top-up topology of hot water heating, alongside intelligent control, and identify the key propositions to the installer, householder or landlord whilst also creating sufficient incentives for the utility/aggregator	£673,092
PassivSystems Limited	EDF Energy Customers Limited, Energy Systems Catapult	No Regrets Renewable Responsive Heating Project	The projects tests whether new hybrid heating consumer propositions that incorporate value from DSR can find a viable unsubsidised high-volume route to market, achieve future carbon targets and are acceptable to	£ 1,000,000

			consumers. The project takes a multi-vector and whole system approach to considering the role of domestic DSR in the decarbonisation of heating by installing commercially funded bivalent heat pump and gas/oil boiler heating systems with advanced DSR controls and aggregation and rewarding customers for the DSR services provided. This includes a demonstration that the additional power capacity demand on the energy system for meeting security of supply standards caused by the daily volatility in renewable generation and occasional long periods of no daily generation can be fully mitigated. It also seeks to quantify the benefits of transferring billions of value from investment in rarely used centralised capacity to converting UK homes from high carbon to flexible low carbon heat.	
Powervault Ltd POWERVAULT	Sustainable Venture Development Partners, Cornwall Insight	Whole House Energy Management for DSR	The project integrates hot water controllers with the new Powervault 3 system. These are deployed in trial homes in the UK to test the ability for Powervault to control water heating devices, and to assess the subsequent benefits which are achieved for customers based on dynamic tariff integration. The new product helps expand the addressable market for domestic DSR, provide extra value for consumers, and help align electric heat loads with the needs of the system.	£359,702
Sero Energy Limited sero homes	Passivsystems Limited, Minus7 Limited	FLATLINE - Fixed Level Affordable Tariffs Led by Intelligent Networked Energy	The project develops the management platform and implements the aggregated system on 50 new pilot homes in South Wales. These new low energy homes are equipped with a live trial of the integrated FLATLINE system. The	£619,371.17

			management system then operates in passive "learn" mode for an initial period, before switching to full active "management" trial operation, when both performance data and occupant feedback are collected to inform future progress and the wider potential of domestic demand side response in this format.	
Voltalis UK Limited VOLTALIS	Electric Heating Company Ltd, DELTA EE	Power of HOMEs	The project demonstrates how domestic properties can deliver highly valuable demand-side services to the electric grid and contribute to energy efficiency and cost optimization for consumers. It is a joint project between organisations from across the DSR supply chain: Voltalis, a European leader of residential demand-side management; Electric Heat Company, a manufacturer of electrical heating; and Delta Energy & Environment, a market research company focused on demand side energy developments, including demand-side response. The project equips 500 homes to aggregate the most common flexible appliances such as electric storage heaters and direct electric heating. Other appliances such as heat pumps, electrical vehicle charging points and water heaters, and similar appliances in small/medium commercial buildings, are also included.	£396,925