Innovate UK

Results of Competition: Smart Local Energy Systems: Demonstrators

Competition Code: 1804_ISCF_SMART_ENERGY_DEMO

Total available funding is £51.3 million

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
HABITAT ENERGY LIMITED	Energy Superhub Oxford: Unlocking scalable solutions for EV charging, battery storage and heat through transmission connection and machine learning	£2,942,174	£1,323,978
KENSA CONTRACTING LIMITED		£2,479,711	£1,115,870
Oxford City Council		£1,615,169	£1,615,169
PIVOT POWER LLP		£11,908,859	£5,358,987
REDT ENERGY (UK) LIMITED		£1,281,985	£448,695
University of Oxford		£402,798	£402,798

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Funders Panel Date: 23/10/2018

Project description - provided by applicants
The Energy Superhub Oxford (ESO) project will demonstrate practical solutions to battery storage, EV charging and heat, by applying innovative machine learning approaches and direct connection to a transmission substation to alleviate or bypass distribution network constraints. Our East Oxford transmission connection point offers 60 MW of capacity from 2019 for a broad range of applications, unlocking the potential for private investment to then flow to a further 44 such sites already secured across the UK by Pivot Power that would deliver a vast 2.2 GW of battery storage, up to 4500 rapid EV chargers and £1.6bn of private investment. **Energy storage** will be installed adjacent to the National Grid transmission substation comprising 47.4 MW of lithium ion technology, and 2.5 MW of redox flow energy storage supplied by UK-based manufacturer redT. The flow battery will be the first of a new class of technology, demonstrating a 'pulse' function that can double nameplate power rating for up to 30 minutes. All energy storage will operate primarily a merchant energy trading business model, buying and selling power in the wholesale market and balancing mechanism with an innovative algorithmic trading approach developed by Habitat Energy, proving out the investability of what we expect will be a 5-10 GW battery storage business model in the UK. **Electric vehicle charging** will also be enabled at scale using 10 MW of connection capacity. Innovative new commercial models will be developed in cooperation with the Oxford City Council, offering abundant and lower-cost power - sub 10-20 pence per kWh - to a range of local electric fleets including buses, taxis, dust carts and commercial fleets, in turn enabling them to accelerate the electrification of their fleets by overcoming obstacles to charging and improving the economic case. The project can also deliver power for rapid charging of private vehicles at car parks and motorway services, where as many as 100 ultra-rapid chargers can be powered. Renewable Energy Guarantees of Origin (REGO) scheme certificates will be bought to provide transparency to consumers about the proportion of electricity that suppliers source from renewable generation. **Heat solutions** will also be developed as part of the project, with machine learning optimising the operation of 320 single loop ground source heat pumps to be installed by Kensa, proving out the ability to shift demand to periods of low prices, minimising consumer bills and overcoming local network constraints.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Innovate UK

Results of Competition: Smart Local Energy Systems: Demonstrators

Competition Code: 1804_ISCF_SMART_ENERGY_DEMO

Total available funding is £51.3 million

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
THE EUROPEAN MARINE ENERGY CENTRE LIMITED	ReFlex	£2,458,290	£2,458,290
AQUATERA LIMITED		£7,073,103	£2,829,241
COMMUNITY ENERGY SCOTLAND LIMITED		£1,654,084	£1,654,084
DOOSAN BABCOCK LIMITED		£2,184,812	£546,203
Heriot-Watt University		£804,353	£804,353
Orkney Islands Council		£399,373	£399,373
SOLO ENERGY LIMITED		£14,063,897	£5,625,559

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Funders Panel Date: 23/10/2018

Project description - provided by applicants
The energy system in Orkney is subject to specific constraints, and its independent location means it is the ideal location to demonstrate the capabilities of a self-contained smart energy network, and the potential impact it can deliver. Orkney is a representation of energy supply problems which energy networks find difficult to solve using traditional technology. Specifically; Orkney produces 130% of the electricity it needs through existing installed renewable generation, yet 63% of Orkneys residents live in fuel poverty. Project **ReFLEX** will install **FLEX**ible technologies to address the restrictions which cause this imbalance and demonstrate a **Re**sponsive Virtual Energy System which links these networks together. Thus, allowing production to be maximised, efficiencies to be recovered, and new business models to be proven, meaning energy can be supplied at minimum cost to the consumer and generating knowledge which will allow us to replicate activity and impact across the UK and internationally. The project will last for 36 months and include the installation and operation of multiple technologies including: *Hydrogen Fuel Cell for the provision of electricity and heat *Domestic energy storage *Commercial energy storage *Vehicle to grid charging infrastructure *Ground source heat pump systems *Building management systems *Virtual power plant systems *Integrated Grid-smart community-led transport system and infrastructure A Virtual Energy System will combine the above infrastructure alongside existing infrastructure on Orkney to demonstrate the capabilities of a smart energy system; linking together the electricity, heat and transport energy networks to create a system of maximum efficiency and value for consumers, generators, suppliers and operators within the energy system.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Innovate UK

Results of Competition: Smart Local Energy Systems: Demonstrators

Competition Code: 1804_ISCF_SMART_ENERGY_DEMO

Total available funding is £51.3 million

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SOUTHERN ELECTRIC POWER DISTRIBUTION PLC	Project LEO (Local Energy Oxfordshire)	£13,089,096	£3,272,274
EDF ENERGY R&D UK CENTRE LIMITED		£881,845	£220,461
NUVVE LTD		£1,024,330	£460,948
OPEN UTILITY LTD		£1,198,000	£539,100
ORIGAMI ENERGY LIMITED		£1,222,203	£427,771
Oxford Brookes University		£508,822	£508,822
Oxford City Council		£176,380	£176,380
Oxfordshire County Council		£797,031	£797,031

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Funders Panel Date: 23/10/2018

THE LOW CARBON HUB C.I.C.		£19,421,791	£5,826,537
University of Oxford		£1,566,053	£1,566,053

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Project LEO (Local Energy Oxfordshire) delivers a transformative integrated smart local energy system to maximise prosperity form local energy systems and demonstrate new value creation opportunities. The local power infrastructure is at capacity in Oxfordshire. SSEN will demonstrate a neutral 'Market Integrator' that provides information to allow a local energy market place to function effectively with the existing infrastructure. Three companies will develop and deploy market platforms for local energy trading and services provision. Up to 90 plug-in projects, (solar, heat networks, smart neighbourhoods, micro-grids, EV and transport hubs, new housing developments and large flexible loads) - demonstrating new models for investment. LEO is continually improved through the collection and analysis of data to provide insights to the team and to inform the County's energy strategy. This strong evidence base will enable rapid rollout across the UK and beyond. The six key outputs of the project are: 1. **Markets** - accelerating the development of a mature flexible energy market of Distributed Energy Resources that provides solutions to energy needs, constraints and decarbonisation. 2. **New Investment Models** - for Distributed Energy Resources that reflect the value of their assets and their flexibility. 3. **Model for DSO** - the Distribution System Operator is a new type of organization that facilitates the effective use of the local power infrastructure. In LEO, SSEN will demonstrate the DSO's core role of neutral facilitation of markets, to enable the utilisation of Distributed Energy Resources, and how it resolves possible conflicts of interest. 4. **Assets for Strategic Planning** - developing the tools needed to make effective and efficient whole-system decisions about the energy ecosystem. 5. **Datasets for Research** - sharing understanding so the experience can be replicated elsewhere both in the local context but also nationally through the Electricity Networks Association (ENA's) Open Networks project. 6. **Community of Skilled People** - improving the skill sets of participants and enhancing the social capital of the local energy sector in Oxfordshire and more widely across England's Economic Heartland (the Cambridge-Milton Keynes-Oxford Growth Corridor). With the support of the Local Enterprise Partnership (LEP) and in consort with other bodies based in the region such as the Energy Systems Catapult, the Faraday Institute and the Hydrogen Hub, workshops and networking events will be held to foster a rich innovation sector focused around the clean energy sector.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Innovate UK

Results of Competition: Smart Local Energy Systems: Demonstrators

Competition Code: 1804_ISCF_SMART_ENERGY_DEMO

Total available funding is £51.3 million

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
CLOUD INFINITY PROJECTS LIMITED	Smarthubs SLES	£249,611	£112,325
CONNECTED ENERGY LTD		£15,000,000	£3,150,000
FLEXITRICITY LIMITED		£337,408	£84,352
HONDA MOTOR EUROPE LIMITED		£0	£0
ICAX LIMITED		£2,116,496	£634,949
ITM POWER (TRADING) LIMITED		£4,897,141	£1,713,999
MOIXA TECHNOLOGY LIMITED		£7,189,094	£2,156,728
Newcastle University		£633,285	£633,285

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

PASSIVSYSTEMS LIMITED		£1,952,470	£585,741
SWITCH2 ENERGY LIMITED		£9,527,974	£3,334,791
THE CARBON AND ENERGY FUND LIMITED		£0	£0
West Sussex County Council		£550,000	£550,000

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Smartgrids have not been deployed at scale due to the lack of 1) open architecture IoT systems linking generation and demand 2) stable markets for storage and demand shifting and quantifiable service revenue streams 3) local leadership in the deployment of smart grids enabling demand assurance and multi-vector approaches (IET2018, ADE 2018).Smarthubs SLES will tackle these innovation challenges via a large scale demonstrator. This demonstrator deploys hybrid systems across heat, power & transport connected via interoperable IoT layers that functions as a highly heterogeneous Virtual Private Network (VPP). The consortium is targeting a 30% reduction in future SLES deployment costs across the portfolio of technologies and business model innovations. The outputs of this demonstrator will lower provide evidence for the maintenance, operation and revenue profiles for these technologies and lead to SLES becoming self-fundable by the early 2020s.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results