

Innovate UK

Results of Competition: Energy Catalyst - Mid Stage - Round 3

Competition Code: 1504_CRD_EGS_ENCATMSR3

Total available funding for this competition was £21.150M from Innovate UK, EPSRC and DFID (over all

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
Kite Power Solutions Ltd Keyvnor Morlift Ltd BVG Associates Ltd NCC Operations Ltd Imperial College London Bruce Banks Sails Ltd Artemis Intelligent Power Ltd E.ON UK PLC Shell UK Ltd	KES - Kite Energy Scheme	£1,499,670	£1,049,939

Project description - provided by applicants

Kite Power Solutions Ltd (KPS) is the UK's only developer of a technology to generate electricity from the wind using kites. KPS was formed in 2011 to develop this innovative disruptive wind energy technology. KPS predicts a market entry in 2025 for a 3MW floating offshore system which has a cost of electricity 50% of conventional wind turbines, lower than the wholesale price of electricity removing the requirement for subsidies. This project enables KPS to further scale the existing demonstrated technology with leading UK businesses. These collaborators are BVG Associates supporting the optimisation of the power conversion system; Artemis Intelligent Power providing support in the drive train development; Imperial College supporting aerodynamic development of the wings; The National Composites Centre optimising kite material and manufacturing processes; Keynvor Morlift Ltd to conduct mooring and installation assessments; Banks Sails as KPS kite manufacturing partner. The project will also involve engagement with the wider public and the environmental stakeholders to assess the impacts of the rollout of KPS kite energy technology.

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Spirax-Sarco Limited Howden Compressors Ltd Arctic Circle Ltd Industrial Power Units Ltd Dairy Crest Ltd Brunel University London	Low Temperature Waste Heat to Power Generation	£1,240,628	£805,345
Project description - provided by applicants			
This project will demonstrate on an Industrial scale, a new low temperature heat recovery cycle, the controlled phase cycle (CPC), that will convert waste heat streams in the temperature range of 70C to 90C to high value electricity and address the energy trllemma by reducing the reliance on fossil fuels, improving security by reducing the electricity demand from the grid and produce substantial cost savings for the user. Buiding on successful small scale trials the Innovate UK funding support will allow the consortuim of SpiraxSarco (Lead), Howden Compressors, Artic Circle, IPU Institute of Energy Futures of Brunel University to develop a commercial offering that will target the estimated 300 TWh of heat available in Europeam Industry and beyond. It will position the UK in a strong leadership position globally in low temperature energy recovery through the development of a number of patented innovations and commercialisation of the CPC technology.			

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HiETA Technologies Ltd Bladon Jets (UK) Ltd	High Efficiency Recuperator for stationary power Micro-Turbine (HERMIT)	£1,301,265	£910,886
Project description - provided by applicants			
The project aims to develop a novel recuperator technology for stationary power Micro turbine generators. MTGs already have a number of benefits compared to diesel or other reciprocating internal combustion engines (currently used for decentralised power generation) in that they are able to burn almost any gaseous or liquid fuel with significantly improved emissions. However current markets for MTG static power generators are limited by the inherent fuel-to-electrical efficiency, where the recuperator is a key driver of both engine efficiency and cost. This recuperator project looks to address both these issues to substantially increase the decentralised power market opportunity for MTG systems. Through the application of production Additive Manufacturing techniques, specifically high productivity Selective Laser Melting, the project will deliver a highly efficient integrated recuperator at a competitive cost.			

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Synaptec Ltd University of Strathclyde NPL Management Ltd Instrument Transformers Ltd Bellrock Technology Ltd	Wide-Area Instrumentation of Power Networks using Existing Infrastructure	£1,464,145	£1,108,346
Project description - provided by applicants			
<p>This project will conduct the substantial industrial R&D required to prototype and test a novel distributed photonic sensing technology for the power and energy industries. The unique sensing technology, developed by Synaptec Ltd, can provide wide-area monitoring of both electrical and mechanical parameters (e.g. voltage, current, temperature, vibration) from across the electrical grid from central locations such as transmission substations. By piggy-backing on pre-installed optical fibre on power networks, it will allow network operators to leverage existing infrastructure to improve the robustness of network protection, monitoring and control functions in order to bring on more distributed and renewable generation and reduce the risk and impact of faults or outages on the electrical system. This 36-month project will allow Synaptec to fully develop, validate and prototype a full suite of sensor systems (through both hardware and software engineering) based on this innovative technology platform in partnership with the UK's leading industrial, research and metrological institutions, and to prepare for commercial pilot installations with UK and EU electricity network operators.</p>			

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Johnson Matthey PLC Ilika Technologies Ltd Williams Grand Prix Engineering Ltd University of Oxford University of Warwick	Protected Anodes for Litium Sulfur Batteries (PALIS)	£1,514,722	£1,053,888
Project description - provided by applicants			
The Protected Anodes for Lithium Sulphur Batteries Project (PALIS) will project will develop an innovativeprotected lithium anode component for use in Li-S batteries. The technology will mitigate detrimental sidereactions in the cells, delivering higher performance, high energy density and lower cost Li-S cells for use insmart grid energy storage applications. The approach also enables replacement of critical metals such as Co/Nicurrently used in Li-ion batteries with lower cost carbon, sulphur and lithium. The consortium of JohnsonMatthey, Oxford University, Ilika Technologies Ltd, Warwick Manufacturing Group and Williams AdvancedEngineering combines skills in novel materials and electrode design, PVD and polymer composite coating, scaleup of electrodes and industrially relevant sized pouch cells, also cell, module, pack testing and system design.The project will ultimately deliver a module design study, assessing the performance of the new technologycomponents interlinking performance of project cells with usage patterns/cycles for energy/power in mainmarket applications in the energy storage sector.			

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Smar-Azure Ltd Offshore Renewable Energy Catapult University of Glasgow	Engineered Textile Blade with Actively controlled surface/profile	£1,396,604	£1,098,934
Project description - provided by applicants			
This project seeks to develop, test and verify in simulated environments a prototype of the innovative ACTBlade. It follows on from an Early Stage Catalyst project that successfully validated the potential energy production gains (+9.7%) in wind power generation and the reduction in the levelised cost of energy (-8.7%) associated with the innovative blade design. SMAR Azure owns the full intellectual property; a patent application has been filed (Application No. 1518041.7) covering the design and construction method of the ACT Blade. A further patent will be filed to cover the active shape control system before completion of the project. The project team, SMAR Azure (SA), ORE Catapult (CA) and University of Glasgow (UG), has the technical skills, engineering/experimental tools, commercial expertise and management experience to successfully deliver the project.			

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UK Grid Solutions Ltd Gnosys Global Ltd University of Southampton	NanocompEIM Phase II- Nanaocomposite Advanced Electrical Insulation System for Enhanced HVAC and HVDC Energy Networks	£1,475,023	£1,061,476
Project description - provided by applicants			
NanocompEIM Phase 2 will develop pre-commercial nanocomposite material formulations and component manufacturing processes scaled to full sized components for future power transmission networks including HVDC and HVAC converter and substation equipment for new smaller and more efficient network installations to meet the needs of future low carbon smarter energy grids. The project will produce selected full size components nanocomposite-based prototypes for specific HVDC and also HVAC applications to support the reliable operation of on and offshore renewable energy power networks. The project includes a dissemination phase, designed to support whole industry adoption of nanocompEIM materials technology. This is a vertically integrated project, which engages the complete supply chain from materials producers to equipment manufacturers to end-users in the form of all three Transmission System Operators in the UK who will ultimately use the components containing the materials made by the processes that this project will produce.			

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Camfridge Ltd Imperial College London Beko PLC	Improving the reliability, longevity and lifetime performance of Magnetic Cooling technology	£1,410,000	£1,048,996
Project description - provided by applicants			
The main objective of this mid-range project is to enable magnetic refrigeration technology to meet the needs of the domestic cooling appliance market. The primary goals are to reach levels of reliability and lifetime performance required for this mass market. The project outcomes will enable lower cost high-efficiency appliances for consumers, helping to reduce household energy bills. Furthermore, the energy savings (in Europe), plus the avoidance of polluting gases (in the Americas) will enable a substantial reduction in CO2 emissions. The solution will also allow appliance manufacturers to comply more cost-effectively with increasingly stringent worldwide energy efficiency regulations.			

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