Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

Total available funding is £32 million across early, mid and late strands

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
OPEN ENERGY LABS LTD	Development of a mobile learning platform for training energy innovators in Zambia	£204,853	£143,397
Hackers Guild		£36,900	£36,900
Makerhut Technologies		£6,000	£4,200

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Awaiting Public Project Summary

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LEAP MICRO AD LTD	ECOSMART: Enabling local Circular ecOnomy hubs using SMart solar AnaeRobic Digestion Technology	£113,758	£79,631
CONNECTED ENERGY TECHNOLOGIES LTD		£16,826	£11,778
ENERGY INDUSTRY DEVELOPMENT INITIATIVE		£28,397	£28,397
Meyana Bioenergy Limited		£19,486	£13,640
Solar Sister Entrepreneurs Nigeria Ltd/Gtee		£30,731	£30,731
University of Sheffield		£90,795	£90,795

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Project description - provided by applicants
ECOSMART explores the techno-economic feasibility of smart integration of a novel, enhanced anaerobic digestion (AD) process with solar technology to form the basis of a circular economy model. It will establish an integrated UK Nigerian supply chain, aligning social and gender considerations with economic and environmental benefits. Its focus on valorising cassava, yam, corn and mixed market wastes will ensure a high proportion of beneficiaries are women and those on low incomes. ECOSMART will build on the consortium's expertise, utilising locally available materials and low-cost components to ensure affordability, and reducing feedstock retention time through system design to process waste and generate biogas 4x faster than conventional Continuous Stirred Reactor Tank (CSTR) systems. It will also produce soil amenders and fertiliser in a ratio beneficial for soil management, thus supporting local, sustainable agricultural practices. With a 4.5-year payback, this model of affordable, low carbon, secure bioenergy will tap into Nigeria's £7.45B minigrid market to support enterprise and capacity building opportunities with training planned at later stages of the project to support local manufacture. Control systems will be adapted by UK SMEs for global commercial opportunities. The focus on flexible energy use and affordability will advance demand-side management and minigrid technology, so developing countries can leapfrog centralised infrastructure to pioneer innovative, more equitable models of generation, distribution and use.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
THIN METAL FILMS LIMITED	ECWIN2: Flexible Electrochromic Windows with Photovoltaic Generation	£114,953	£80,467
Cranfield University		£102,400	£102,400
Innovative Nano and Micro Technologies Private Limited		£40,388	£24,233

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AUTONOMOUS DEVICES LIMITED	DamGPR-Drone	£115,000	£80,500
Quantum Leap JMB Marketing		£70,185	£49,130
TWI LIMITED		£110,093	£110,093

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Kingston University	SwanaSmartStore	£83,054	£83,054
Empowered (Pty) Botswana		£40,000	£28,000
Onesun Solar (Pty) Zimbabwe		£65,000	£45,500
SOLAFORM LTD		£45,000	£31,500
University of Ulster		£66,241	£66,241

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PYROGENESYS LTD	Energy Access Africa (EAA)	£57,381	£40,167
ACELERON LIMITED		£43,097	£30,168
CLICKTIME AGENCY LIMITED		£18,120	£12,684
GREENVEST SOLUTIONS LTD		£12,091	£8,464
Liberian3 ltd		£90,815	£63,570
Mobinet Blue 34 Ltd		£40,560	£28,392
University of Leicester		£37,745	£37,745

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ARIYA CAPITAL SERVICES LIMITED	Interoperable energy site dispatch controller driving energy access by enabling seamless integration of multiple power and energy solutions (The Auto-Controller)	£13,148	£8,809
Ariya Finergy Holdings Ltd		£286,270	£191,801

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Given the grid's unreliability, power stabilisation and management are significant problems particularly in rural areas. Dispatching power from multiple sources is a major contributor to costs and CO2 footprint, causing SMEs to depend on unreliable power instead of stable, clean energy. Where grid connections exist, solar PV integration costs are high so most solar PV projects remain idle during frequent power cuts. There is considerable scope for an integrated solution to address these problems. Ariya has developed an innovative integrated Auto-Controller incorporating 5 power functionalities, which significantly supersedes the closest current state-of-the-art and addresses the need for inter-operable, affordable devices. This Auto-Controller matches solutions to common problems facing the East African agri-producer and processor, identified from our many site visits and energy studies. Currently, there are no known grid-connected energy storage devices in East Africa. Furthermore, there is a zero-export law with the Kenyan utility which causes solar PV systems to be undersized and often less than fully productive. The Auto-Controller optimises power solutions, increases the number of ways of installing clean energy and provides an efficiency component with an in-built control signal which optimally reduces the cost of power. Ariya's internal life-cycle cost analysis indicates that the levelized cost of power will be 30% lower than a conventional system, which represents 25% lower energy costs for a mini-grid. Ariya has already done significant work -- a prototype controller and compatibility testing (with inverters and a common energy meter) have been completed. Data feed integration to a time-series database and machine-learning platform is ongoing. The project specifically targets the cut-flowers market (in which Kenya is a global market leader) and the dairy industry (where Ariya has a robust client pipeline). The project predominantly involves feasibility studies but also an element of experimental development; we will demonstrate the Auto-Controller at 2 agriculture processors in Kenya. An additional two locations will be identified for installation of an in-depth load monitoring study to further identify the Auto-Controller's value-add. Another 150+ mini-grids will be implemented in Kenya by 2023 and per ERC regulations, every large C&I user (3,000+ facilities) is required to install renewable energy performance measures every three years. This represents a scalable opportunity for innovative companies to deliver affordable and reliable renewable energy -- which this project aims to fulfill. Coupled with Ariya's zero-capex financing proposition, the project eliminates a major barrier to mini-grid and C&I clean energy scalability.

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Lambda Energy Ltd	Luminescent Downshifting to Improve PV Efficiency in Regions with High Solar Irradiance and potential impact on off-grid solar in sub-Saharan Africa	£130,006	£91,004
Cranfield University		£100,000	£100,000
University of Bath		£49,750	£49,750
VERO GRID LTD		£20,012	£14,008

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ION VENTURES LTD	Promoting access to clean and affordable energy in urban informal settlements	£13,714	£9,600
Zonke Energy Pty Ltd		£62,357	£43,650

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Project description - provided by applicants
ion Ventures and Zonke Energy will develop a microgrid electrification system for a low-income urban community in South Africa, off grid. The project is designed to hit all three areas of the energy trilemma of: • Cost • Emissions • Security of supply and energy access In South Africa, nearly one million households live in urban informal settlements without grid-connected electricity. Zonke, supported by ion, intend to develop and operate a community electrification system that will build on an early prototype that Zonke has developed. The project will have a focus on empowering local partners and communities, promoting knowledge dissemination both within the local township, and local academic centres.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ENSO TRADING LIMITED	Solar Energy for Cleaner, Safer Kitchens in Kenya	£111,974	£78,382
Brunel University London		£80,983	£80,983
Mwangaza Light		£41,820	£29,274

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H2GO POWER LTD	Zero-Emission & Reliable Power for Hospitals in Sub-Saharan Africa (hZERPH)	£297,348	£208,144

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Project description - provided by applicants
hZERPh is a business-led, industrial research project, demonstrating significant innovation in the area of clean energy generation, storage and delivery of reliable power in developing countries with main focus on Nigeria. It will focus on the development and subsequent demonstration of an innovative AI software operated modular Plug and Play energy storage unit, that stores renewable energy on demand, in the form of safe, unpressurised solid-state hydrogen. The hydrogen can then be used to provide reliable & clean energy for long durations (\>8h) in isolated and remote locations with poor or no connection to the grid. We propose the creation of a plug and play unit (PnP) for off-grid energy storage that stores excess power from solar panels and/or wind energy in the form of hydrogen through the utilisation of new patented safe solid-state hydrogen technology that can be brought close to the user due its safe nature (1% of the pressure in 700bar traditional compressed hydrogen storage cylinders).This will allow access to power around-the-clock and keep vital services and operations running. To demonstrate and analyse the feasibility of this system and inform future scaling decisions, we intend to design a product feasibility for "smart" off-grid storage units and simulate their operation using real-world energy consumption data collected from a Nigerian hospital. With this simulation in place, we will be able to understand vital metrics like ROI, potential bill savings, electricity-access time, changes in ability to perform vital operational functions (medical operations, examinations, etc.), emissions reductions and more in the context of a potential full-scale implementation. Furthermore, we will be able to determine the viability of the proposed energy storage unit as an effective commercial solution; Nigeria as potential target market, and hospitals as a prioritised customer segment as we bring the energy storage system to market. By harnessing renewable energy, hydrogen systems, and H2Go Power's innovative modular storage technology, all of the above use-cases are both disruptive and game-changing, with hZERPh being deployed to displace existing emitting and polluting diesel generators. H2GO Power will evaluate commercial scale-up opportunities and volume manufacturing of its the already certified solid-state hydrogen storage reactors, as well as adapting and exploiting this approach for other industries, sectors and markets. Successful implementation and follow-up scaling of hZERPh will enable the continued penetration of renewable energy in the developing world, facilitate energy access through leapfrogging on building infrastructure and reduce dependency on emitting and polluting diesel.

Innovate UK

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Heriot-Watt University	Dispatchable Air Conditioning (DAC)	£124,248	£124,248
Auroville Consulting		£49,560	£34,692
Environmental Design Solutions Pvt. Ltd.		£60,000	£36,000
FINDHORN INNOVATION RESEARCH & EDUCATION, CIC		£14,980	£10,486
SCENE CONNECT LTD		£39,972	£27,980

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Project description - provided by applicants
Incumbent methods of managing supply and demand of electricity in India are being disrupted by increased demand driven by economic and population growth, growth in connected intermittent generation driven by the low carbon transition and by the electrification of transport driven in part by urban air pollution concerns. It is widely acknowledged that new approaches are required to assist grid management if policy objectives associated with security of supply, decarbonisation and air quality are to be met. A key driver of demand growth in the residential sector is the uptake of residential air conditioning (AC) systems which has reached 40% in many urban centres. This technology also represents an untapped demand response opportunity; for instance providing c8GW of flexible operating reserve in the US with provision highly cost competitive compared to alternative methods of flexibility provision. The DAC project develops a novel control system capable of accessing flexibility from existing residential AC systems in India. The system modifies operation of AC systems based on input from a multi-objective, cloud-based control platform using grid property triggers (e.g. voltage, frequency) and time based signals. The controller measures internal temperature in the dwelling to ensure that the accessed AC system flexibility is constrained by found, local thermal comfort requirements. An evidence base for the system approach will be provided by a field trial involving deployment of DAC systems in a 30 dwelling, six month field trial located in Tamil Nadu in Southern India. The design and commercialisation of the system will be guided by three stakeholder workshops. Output from the first will be used to define control objectives relevant to Indian grid management at both distribution and network level. Output from the second will explore the value that can be created from provision of these services, allowing subsequent development of novel business models that socialise derived value between all stakeholders. These business models will be tempered using output from the third workshop that investigates mitigation approaches for any distributional effects of the technology. The DAC project will be delivered and managed by an established team who have been collaborating on demand and grid management projects in India for the last three years. They contain experts in social inclusion , thermal comfort, product design, data science, control theory and business development in the sustainability sector and contain a wide network of influencers in Indian energy policy at both a National and State level.

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NORTECH MANAGEMENT LIMITED	Planning, integration and Control of mini-grids with Renewables and Energy STorage (Pi-CREST)	£149,187	£89,512
Bayero University Kano, Nigeria		£18,895	£18,895
University of Bradford		£129,963	£129,963

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CARNOT LTD	Carnot Gen-Sets - Feasibility Study	£225,090	£157,563
Ethiopian Institute of Technology-Mekelle, Mekelle University		£74,380	£74,380

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GRAVITRICITY LIMITED	Gravitricity Energy Storage	£139,695	£97,786
CAELULUM LTD		£83,850	£58,695
RESA SERVICES		£76,109	£53,276

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Cranfield University	Efficient & Affordable Medium-Size Concentrated Solar Power Device for Low Cost Clean Cooking	£80,464	£80,464
CAMETICS CAMBRIDGE ADVANCED METALS LIMITED		£110,000	£77,000
SARVAAY Solutions LLP		£27,113	£18,979

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
The Concentrated Solar Power (CSP) can generate a large amount of heat from the sun for cooking, laundry, crop drying which can greatly serve low-income families in developing countries in the remote/off-grid locations. However, the CSP devices are not as energy efficient as other renewable energy (wind and hydroelectric) producing devices. Hence, the aim of this project is to build energy-efficient and affordable Concentrated Solar Power (CSP) device for potential applications in low cost, smoke-free cooking for mid-day meals for school children, a small cafeteria, canteens and vendors using women cooks and women entrepreneurs in India. The objectives of our project will be to 1. Build a small energy-efficient and low-cost CSP based cooking device and carry out a small feasibility study for md-day meal cooking 2. Engage with dedicated schools as well as women workers/cooks/entrepreneurs who work with local schools and small canteens, restaurants in India to improve renewable energy access to women and socially underprivileged populations.

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CHARM IMPACT LTD	Project Hummingbird	£140,324	£98,227

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Brunel University London	Solar heat storage for drying Forest Tree Seeds (SoFTS)	£55,116	£55,116
ENSO TRADING LIMITED		£134,730	£94,311
Kenya Forestry Research Institute		£12,000	£12,000

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
INTELLIGENT POWER GENERATION LIMITED	Sustainable Energy from Locally Available Bio-Fuels	£297,746	£208,422

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
The project is aiming to show the potential for linking 1) local production of energy crops, 2) local processing of this plant matter into Biofuels, with 3) clean distributed "off grid" energy generation, potentially providing a low-cost, low-emission source of power for Kenya, that could lead to millions of people within the next decade being provided with a sustainable source of energy to raise their living standards and develop a stronger, more diverse local economy. Access to energy is one of the most important factors in increasing living standards, as it provides potential for local industry to flourish and jobs to be created. However, total cost of ownership, sustainability, emissions and the local benefits are key factors in the choice of the energy infrastructure. By empowering the local community to develop their own skills and capabilities in the agricultural development of energy crops and by introducing international best practice for biofuels, will provide potentially thousands of long-term jobs, and enable Kenya to become more self-sustainable for energy and less reliant on international energy imports. If successful this project will enable local communities and government organisations to provide the necessary infrastructure to develop long-term economic development plans on a strong foundation of certainty around energy supply and long-term pricing, which will also assist in developing local capital markets and access to funding for those that cannot gain entry to this today. Many smallholder farmers remain poor and food insecure and have limited access to markets and services. By integrating food growth, with energy crops, and distributed energy, all underpinned by local smallholders and farmers, will aim to create a source of livelihoods to thousands of people across the value chain providing a reliable source of income and providing numerous economic opportunities. The CO2 saving by moving to this approach is potentially huge, with over 60,000 tonnes of CO2 being displaced for every 10MW of energy installed operating in this programme. With Kenya currently requiring 800MW of energy nationally, the potential for carbon reduction is significant.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SOLAR POLAR LIMITED	Solar Fridgenomics	£153,751	£107,626
FUTUREPUMP LTD		£19,458	£13,621
Imperial College London		£120,725	£120,725

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
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Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

Total available funding is £32 million across early, mid and late strands

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
CALDERA HEAT BATTERIES LIMITED	Development of Solar PV powered cooking stove with built in Thermal Energy Storage	£249,330	£174,531
M-KOPA UK LIMITED		£50,548	£25,274

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
Almost 800 million people in Sub-Saharan Africa use biomass for cooking, which creates a burden that includes health hazards (respiratory illnesses and burns), increased deforestation, spending a large proportion of income on fuel, time spent collecting fuels, and reduced educational opportunities for women and girls. For decades the dominant policy on cooking energy has been to improve the combustion efficiency of biomass fuels. This policy has broadly failed and the dispersal of improved cookstoves is not keeping up with population growth. Proposals have been made for alternative approaches using electrical cooking either from batteries + solar PV (e-cook) or from electrically powered low energy pressure cookers. The first of these has proved too expensive and the second is culturally difficult involving changes to people's established cooking patterns. The project will explore a third option for a low carbon, low cost, secure cooking energy solution, which uses an insulated heat storage block charged from solar PV to determine if this is a competitive alternative. The project partners are Pumped Heat, a UK company that is expert in high temperature heat storage/insulation, and M-KOPA, the clear market leader in 'Pay as You Go' in East Africa with over 750,000 customers using their solar home products on a daily basis.

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

Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

Total available funding is £32 million across early, mid and late strands

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
RFC POWER LIMITED	Low-Cost Redox Flow Electrolyte - LoCoLyte	£277,886	£194,520

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
The objectives of the LoCoLyte project are to reduce the high costs of the electrolyte in redox flow batteries, making them more economically viable for use in developing countries where the electricity grid is weak and un-reliable. Flow batteries have been identified as a promising technology for addressing the unique energy demands in weak grids, but adoption has been hindered to date by their high up-front capital costs. The largest factor in the cost of a large commercial flow battery system is the electrolyte, as these typically consist of vanadium redox couples. This feasibility project aims to demonstrate a high-performance, low-cost, durable Manganese-hydrogen flow battery (MHFB). This storage technology has the potential to provide many hours of high quality power from the kW to MW-scale. A key advantage of this approach over other flow battery chemistries is that it increases power density through use of the hydrogen couple, and utilises a very low cost manganese redox couple. RFC Power has developed a novel electrolyte based on manganese which is estimated to be a tenth of the cost of a vanadium electrolyte in terms of $/kWh of energy stored. In combination this offering will significantly reduce the up-front system cost, which is a major barrier to the widespread adoption of current commercial flow battery technology and is particularly relevant in developing economies.

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Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SOLARISKIT LTD	Development of a low-cost and easy to deploy solar thermal collector	£117,693	£82,385
CHALLENGES CATALYST LTD		£68,706	£48,094
Heriot-Watt University		£110,719	£110,719

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
SolarisKit is developing a new, lower cost, flat-packable solar thermal collector to the sub-Saharan market. Our collector will provide a more affordable method to provide clean hot water to homes, business (e.g. hotels) and industry. This project focuses on developing the collector for pilot trials in Rwanda. We will be targeting the installation of up to 100 collectors for a range of applications including domestic and commercial.

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PYROGENESYS LTD	Ethiopian Minigrid Extensions & Energy Storage (EMEES)	£71,223	£49,856
ACELERON LIMITED		£23,864	£16,705
Aston University		£111,238	£111,238
COAL PRODUCTS LIMITED		£28,633	£14,316
Ethio Resource Group		£34,673	£24,271
University of Surrey		£30,337	£30,337

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
The Ethiopian Minigrid Extension and Energy Storage (EMEES) project will further develop an innovative biomass conversion technology (PyroPower) which received Energy Catalyst funding (grant 105268). The project is effectively a Feasibility Study which will assess the viability of setting up an in-country demonstration plant in Ethiopia. The project defines 3 distinct market opportunities as outputs of the technology, which address energy storage opportunities which will benefit urban and rural communities in Ethiopia. The market opportunities are: 1) direct provision and extension of electricity through biomass-powered minigrids and rechargeable lithium battery storage options; 2) provision of an upgraded bio-oil/biodiesel fuel blend which will replace fossil-derived fuels in internal combustion engines; and 3) a smokeless biochar which can be briquetted or pelletised for use in local markets, as a replacement for traditional firewood and charcoal for cleaner cooking options, or exported as a foreign exchange-earning commodity.

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Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
University College London	Improving off-grid energy and water access through innovative passive-thermal technologies.	£84,671	£84,671
Bahir Dar University		£14,952	£14,952
ECONOMAD SOLUTIONS LTD		£79,448	£55,614
Emahus Solar and LPG gas trading (Ayalew Tizazu)		£14,999	£10,499
THE CENTRE FOR GLOBAL EQUALITY LIMITED		£20,039	£20,039
THERMOELECTRIC CONVERSION SYSTEMS LIMITED		£66,858	£46,801

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
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Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
GREEN GLOBE ARCHITECTURE LTD	Energy Facilitated Markets Places	£116,700	£81,690
OTASKI ENERGY SOLUTIONS LTD		£110,052	£77,036

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
Green Globe Architecture (GGA) is an integrated design-led sustainable architectural and engineering practice that has developed a desk-based architectural model and operational concept of the Energy Facilitated Market Place (EFMP). The EFMP concept utilises Renewable Energy technologies to provide temperature/sensor controlled market places to alleviate high levels of Post-Harvest Losses in Sub-Saharan Africa. As such delivering a socio-economic outlook aimed to provide viable solutions towards creating rural economic empowerment. Our work is unique in that we have linked sociological and health/wellbeing research to provide designs that have social and economic impact anchored by sustainable infrastructures. As a case in point; women, particularly in agriculture in developing countries face a complex interplay of intensifying climate impacts and gender inequities. Our vision is to provide sustainable infrastructure, services, and social protection for gender equality and the empowerment of rural women and girls through programmes and infrastructure that we realise requires special attention from development partners, investors and calls such as the Energy Catalyst Round 7. Otaski Energy Solutions (OtaskiES) is an AI-based energy solutions company that integrates consumers' behavioural patterns and energy utilisations to implement new energy consumption profiles to reduce carbon footprint and energy cost. GGA and OtaskIES have partnered to deliver the first of its kind EFMP that redesign infrastructure and energy profile targeted at sustainable, affordable and reliable energy access. The collaborations look to solve the energy trilemma and sustainability issues that relate to wealth distribution, gender and socio-economic well-being in Nigeria, Malawi, Mozambique and Kenya. This is done by disruptively building a market place in rural/urban Africa that serves as a clean energy generation farm for the market and adjourning communities, and use artificial intelligence (AI) to deliver affordable and reliable electricity.

Innovate UK

Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

Total available funding is £32 million across early, mid and late strands

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SMART VILLAGES RESEARCH GROUP LTD	MInigrid Storage Optimisation through Community Simulations of Demand-Side Management	£50,181	£35,127
ClearSky Power		£54,507	£38,155
Energy Action Partners		£104,023	£104,023

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
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Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SEMWAVES LIMITED	A Self-contained Solar-Hydro Micro Power Plant for Uninterrupted Supply in all Weather Conditions	£99,653	£69,757
J&C IMPEX LIMITED		£75,300	£52,710
University of Glasgow		£124,748	£124,748

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
In this project, we will build the first hybrid solar-hydro power plant and its distribution network to provide clean, affordable and secure electricity to a remote village with approximately 60-70 households and shops in Chittagong Hill Tracts (CHT), Bangladesh. The system addresses energy poverty in this area and will empower more productive activities to help uplift residents' quality of life. Bangladesh has among the lowest national electricity access rate in South Asia, which severely limits its development prospects. Classified as a least developed country on the DAC list of ODA recipients, almost 1 in 10 inhabitants of Bangladesh live in extreme poverty. In CHT District, like other rural communities where 65% of the population live, poverty rate can be as high as 35% (HIES 2016). Only about 59% of the rural population in Bangladesh has access to electricity, with the percentage being as low as 37% among the poorest quintiles (Dhaka Tribute, 21-April-2019). CHT lags far behind the national average rural access rate due to the region's hilly terrains, which make it inaccessible to national grid. The community relies heavily on low-quality fuel such as kerosene, candles, dung cakes and firewood for energy. Lack of access to modern energy impedes potential development and growth of rural areas, creates a poverty trap and deprives rural residents of improved livelihoods. While solar-home-systems (SHS) have become popular, they fall short in providing reliable energy because they are limited by weather conditions, need expensive battery replacement and supply short duration of energy of low capacity. The unaffordable maintenance costs prompt high obsoletion and hence waste. Our technology presents an improved off-grid solution to meet the energy trilemma of supplying secure and affordable access to clean renewable energy to rural residents, including those living in most remote and disadvantaged areas. The system combines solar and hydro power to offset the impact of unfavourable weather conditions; allows 24-hour uninterrupted energy supply; avoids batteries; and is scalable. Since the system will be centrally maintained, it is less costly, more user friendly particularly for elderly, women and disabled residents, and minimises obsoletion and waste. Even the poorest households will be connected and are given the choice to consume what they can afford. This ensures inclusiveness. Energy costs will be lower than using kerosene and comparable to SHS. The system can be easily integrated with an irrigation and/or drinking water filtering system for attaining additional benefits.

Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

Total available funding is £32 million across early, mid and late strands

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ODQA RENEWABLE ENERGY TECHNOLOGIES LIMITED	Mini-grid scale CSP feasibility project for off-grid applications in Namibia	£105,952	£74,166

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
The intermittency of wind and solar PV electricity generation, in combination with the high cost of electricity storage options, means the world still relies on fossil fuels for the majority of its base-load and peak electricity demand. Concentrated solar power (CSP) solves this issue by integrating cheap, durable, and long-lasting thermal energy storage, which can be used to generate electricity after the sun has gone down. Odqa, a venture backed engineering spin-out from the University of Oxford, turns up the heat on CSP with its proprietary aerospace heat capture system, which increases the operating temperature of the receiver tower, unlocks the use of high temperature cycles in the power block, and raises the power output by up to 100%. This increase in power output significantly reduces the price of electricity produced, making it cost-competitive with all other forms of dispatchable power. With the numerous advantages that Odqa's CSP design offers, a scale-down to a mini-grid 1-10MW is now a possibility and provides an opportunity for sub-saharan African countries with high solar energy resource to electrify remote towns suffering from energy poverty. The project funded by this grant would be a feasibility study assessing the viability of scaling down our new CSP system for use as a 1-10MW mini-grid in a currently un-electrified part of Namibia. The outcome of this study would be a system design and detailed analysis of costs for a 1-10MW mini-grid system providing heat and electricity, and the potential impact of electrification and job creation provided by local industries and as a result of building CSP plants on poor households in the region. This study would then be used for a mid-stage application to construct a pilot plant in the region. The project would also investigate the possibility of using the heat produced from the process for a desalination plant to increase access to clean water. Finally, Odqa hopes that this feasibility study could be used as evidence that CSP technology is more economical even for rural areas and thus encourage the Namibian government to invest in alternatives to PV while benefiting from the country's massive solar resource.

Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

Total available funding is £32 million across early, mid and late strands

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
Cranfield University	A CSP and TFG hybrid energy system	£149,913	£149,913
IBEDA NIG LTD		£18,470	£12,929
TFG GLOBAL POWER LIMITED		£74,677	£52,274
THERMOELECTRIC CONVERSION SYSTEMS LIMITED		£56,858	£39,801

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
Awaiting Public Project Summary

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Results of Competition: Energy Catalyst Round 7: Early Stage

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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
PLENOL LIMITED	PowerBoxx	£59,145	£41,402
IBEDA NIG LTD		£231,040	£161,728

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
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Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DALMATIAN TECHNOLOGY LIMITED	Remote Solar Systems (RemSol)	£79,973	£55,981
Environmental Marine Solutions Ltd		£62,501	£43,751

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Awaiting Public Project Summary

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
NERC British Geological Survey	Use of innovative techniques to ensure Lithium brine supply for the low-cost battery market	£149,962	£149,962
SATELLITE APPLICATIONS CATAPULT SERVICES LIMITED		£149,987	£104,991

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
"The aim of this feasibility study is to develop a series of tools enshrined in a workflow that enables the identification of how Lithium (Li) brines can be properly exploited for the low-cost battery market. Using remotely sensed data to support basin-scale geological understanding, hydrology and salar characterisation this will enable hydrogeological conceptual models to be created and then developed into numerical models. Thus, enabling an optimised wellfield development to abstract Li-rich brines. This workflow will be general for any salar, but will be developed in Uyuni, Bolivia (largest deposit of Li brines in the world). The workflow and tools within it will provide the basis for repeating this anywhere in the world where liquid brines exist and include those elements required for low-cost battery manufacture. The Earth's crust has a relatively high quantity of Lithium, being the 27th most abundant element on earth. Lithium is found in nature in a number of mineral forms and compounds with different lithium metal content. Although South America has the world's largest lithium sources mainly in the Lithium Triangle (Bolivia, Argentina, Chile and the recent incorporation of Peru), Australia, US, and China are also major producers. The last big player of the Latin American Lithium Triangle is Bolivia. It is estimated to possess around 50-70% of the world's Lithium resources (largely unexplored, so this figure is speculative) but does not yet produce any significant volumes of Lithium. The outcomes of this project will help Bolivia to speed up this process supporting the economic development of the country but maintaining a responsible and sustainable growth of lithium extraction."

Results of Competition: Energy Catalyst Round 7: Early Stage

Competition Code: 1906_DFID_CRD_CGI_ENCAT_R7_EARLY

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
University of Cambridge	Upscaling LiFePO4 battery production for Bolivia	£66,014	£66,014
CB2TECH LIMITED		£150,000	£105,000
NERC British Geological Survey		£83,977	£83,977

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
"A large proportion of the Bolivian population live off the electricity grid. This proposal aims to aid the Bolivian company Yacimentos de Litio Bolivianos (YLB), and the local academic communities, to produce low cost batteries to combine with solar panels to provide electricity for up to 250,000 families suffering from energy poverty, energy poverty disproportionally affecting women and children. This project will begin to address the challenge of upscaling the manufacture of battery materials by focusing on translating the UK's expertise in these areas to Bolivia. The feasibility study will identify the areas of principal scientific need and propose mechanisms for filling these gaps over the medium term through knowledge exchange with the UK. Proposed synthesis methods will be trialled and full-cell testing of lithium-iron phosphate batteries will be performed at the University of Cambridge and the Cambridge-based SME CB2Tech. The proposal will facilitate an exchange of UK and Bolivian experts (the UK experts coming from the British Geographical Society and Cambridge) in lithium battery raw materials and technology. Even without further intervention, this study and pilot is expected to accelerate the path to producing batteries for the target number of communities within 24 months, removing the need for research and practice that Bolivian experts would otherwise undertake without access to UK knowledge."

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