

# Innovate UK

**Results of Competition:** November 2017 Sector Competition Strand 2:  
Infrastructure Systems - 3 to 12 Months  
**Competition Code:** 1711\_MM\_INFRA\_R4\_ST2\_12M

**Total available funding is £9.5m in total across 3 streams**

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

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>FERGUSON MARINE ENGINEERING LIMITED</b>	HyDIME (Hydrogen & Diesel Injection in a Marine Environment.	£365,760	£219,456
HSSMI LIMITED		£101,566	£101,566
LLOYD'S REGISTER EMEA		£80,079	£40,040
ORKNEY FERRIES LIMITED		£34,582	£20,749
THE EUROPEAN MARINE ENERGY CENTRE LIMITED		£48,822	£48,822

### **Project description - provided by applicants**

The overall aim of the HyDIME project is to design, integrate and trial an innovative hydrogen / diesel dual fuel conversion system for a 50kW diesel auxiliary power unit on a car ferry operating between Shapinsay and Kirkwall in Orkney. The project will last 12 months and result in: \* The physical integration and proof of concept of the hydrogen conversion system working on a commercial ferry \* The demonstration and testing of the system in accelerated sea trials to gain approval for the integration and usage of Hydrogen in a commercial vessel \* The delivery of a scale up plan that outlines how the adapted ferry can interface with and optimally harness the 'Surf & Turf' Hydrogen production system in Orkney and how this can be effectively replicated across the UK. HyDIME will build on the outcomes from 2 previous innovation projects: the 'Surf n' Turf' project in Orkney, which has enabled excess energy produced from wind and tidal turbines to be harnessed and channelled through an electrolyser to produce hydrogen at the Shapinsay port; and the 'SWISH2 & LHNE project' which provided a feasibility study into the viability of a dual hydrogen injection system on road applications

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ENGAS (UK) LTD	Design of a liquid-piston compressor for raw-wet-biogas to produce biomethane for vehicles and back up power.	£99,494	£69,646

### Project description - provided by applicants

Engas UK Ltd is developing a novel raw-wet biogas compressor to directly produce ultra high purity bio-methane for i) refuelling of natural gas vehicles, and ii) Cloud-based back up power. This backup power will be suited for Smart Grid services and off-grid power generation. This solution will also be exported to abroad where CNG vehicles are common and the electricity grid is often unreliable. **\*\*Problem:\*\*** There is often a lot of stranded biogas in smaller sewage treatment sites, landfill gas sites, and many existing biogas plants sites where moving raw biogas from one location to another location will create a significant business opportunity; unfortunately shipment of raw biogas is currently NOT feasible due to the high moisture content, high level of CO<sub>2</sub> and corrosive H<sub>2</sub>S impurities. The moisture content in biogas will block the mechanical piston unless the gas is dried upfront of compression. Then CO<sub>2</sub> will liquefy during compression at above 60bar at ambient temperature causing serious blockage of piston/valves etc. H<sub>2</sub>S in raw biogas will also cause corrosion inside the compressor. Drying of raw biogas is inefficient due to the relative humidity causing a high level of surface water in raw biogas. **\*\*Solution:\*\*** Engas UK is developing a technology where wet-corrosive biogas having high CO<sub>2</sub> content will be compressed and dried and the CO<sub>2</sub> will be separated thus producing about 97% Biomethane at 200-250bar, which can be then shipped to a different location for usage e.g. refuelling of vehicles, or for power generation as back up power replacing diesel generators. There is an ongoing debate to phase out diesel backup generators to reduce local pollution and for example, the Government of Delhi has banned the use of diesel generators in Delhi from Nov 2017 to reduce the air pollution, which opens up a large market for bioCNG powered back up generators. At 250 bar biomethane has 3 times greater volumetric energy density (kWh/lit) than hydrogen, and 3 times greater energy density than the best Li-ion batteries, which will be ideal for energy storage at the most economical options for £/kW installed, and £/kWh delivered. The above solution addresses all three aspects of **\*\*energy trilemma of Affordable, carbon neutral, high efficiency, and energy security.\*\*** This solution would be suited for stranded biogas from existing sources and also to convert the organic waste to Biomethane at dairy farms, pig farms, new sustainable housing projects, University Campus, business parks etc."

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<b>IGEOLISE LIMITED</b>	iShop: enabling citizens to explore high streets using their most efficient transport mode	£98,806	£69,164

### **Project description - provided by applicants**

This project is to radically improve the store locator pages that generate a vast number of inefficient journeys to local retailers, restaurants and entertainment venues. Every single second, there are 20,000 searches on Google for local information - it's over 1/3rd of all web searches. Most go to the store locator pages of 'bricks and mortar' venues; 76% result in a journey to a related store within 24 hours; 28% result in a purchase (www.thinkwithgoogle.com). The humble store locator page is one of the most trafficked pages on the web, and generally sourced from specialist store locator suppliers such as Bridge, Yext, Storemapper, Bullseye et al. However, nearly all store locator pages return results by distance (this store is 5.2 miles away, that one is 6.4 miles, etc), which is a highly inefficient way to plan a journey. Urban areas are home to 50%+ of the world's population and frequently plagued by congestion, pollution and scarce parking availability. Public transport, walking and cycling are often much faster, cheaper, healthier alternatives. iGeolise have built the TravelTime platform to rank and sort locations by the travel time and transport mode of the user's choice. This project will enable us to change how the TravelTime platform returns results, so that; 1\ it seamlessly integrates with existing specialist store locator providers so users can find venues by their available travelttime and transport mode. Deployed this way, TravelTime can quickly become available to many retailers. And 2\ the TravelTime platform will also power our own store locator page that any retailer can quickly and easily add to their web or mobile site (within 30 minutes, without great technical knowledge). The 'big vision' is to radically improve one of the most used yet inefficient pages on the web and mobile sites of every 'bricks and mortar' organisation in the world, and as a result to make local travel more efficient. To show where public transport is a better option than driving. To schedule several destinations (e.g. multiple shops, then a cafe) into an efficient route. To show locations (e.g. restaurants) convenient for several people to meet up - with their routes there and back. On a human level, the vision is to enable a chemist's store locator to answer this question for a mum whose child is ill, 'I don't have a car, which chemist can I reach before they close, using public transport and walking'?

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EMU ANALYTICS LIMITED	WeatherSense+	£283,888	£198,722
AMEY GROUP INFORMATION SERVICES LIMITED		£46,138	£23,069
University of Birmingham		£104,705	£104,705
<b>Project description - provided by applicants</b>			
WeatherSense+ is a solution designed to allow the organisations responsible for key infrastructure to monitor, understand and predict the impacts of day-to-day and extreme weather on the ways in which real populations interact with infrastructure systems. It uses an innovative blend of big data analytics, real-time, historic and predictive data modelling and data from a variety of new and innovative sources including mobile phone networks, micro and macro weather sensors and a variety of open (and private) infrastructure / services data (such as transport and urban service operations). The platform collects, blends and analyses these data sets, and brings the derived insights to life through an interactive, visual web application, that will be made commercially available to relevant organisations, enabling them to react and plan for infrastructure impacts as a result of increasingly variable weather conditions in the UK.			

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CARTOGRAPHIX LTD	LOcality analytiCs for urbAn Living ("LOCAL")	£42,230	£29,561

### **Project description - provided by applicants**

In 2016 >1.2million UK residential property transactions took place, averaging £225,956\ . For most people, property is the most expensive purchase they ever make, and as a long-term investment, requires extensive research to ensure the right choice is made. Top among factors to research is location, location, location," with properties boasting desirable location attributes, such as proximity to green space commanding a premium. While real estate vendors have made some effort to incorporate basic location data into their service offerings, e.g. school performance reports, the range (usually no more than 3-4 variables), depth (typically static, and single dimension) and quality (often out of date, and only partial) are limited, and the user experience remains fragmented and clunky (e.g. requiring separate views for each variable or even in some instances, simply suggesting which 3rd party sites users may wish to explore). To determine a property's local environment and factors conditioning future life quality, e.g. air quality, noise pollution, connectivity, etc, the onus remains on the prospective buyer to do their own research. Lacking expertise in data analytics, or even familiarity with what data is available and where, this often results in long, frustrating, expensive, and sometimes unsuccessful searches. By failing to seize an opportunity to provide their customers with additional value, real estates agents are missing out on a means of extending their service offering, boosting customer engagement and differentiating themselves, while end users are unable to fully factor the quality of a local environment into their property-purchasing decision-making. Without knowing a location's true quality of living, including local public service provisions, the value ascribed to these services is not adequately captured in property prices and people remain unaware of services on their doorstep. This 6 month LOCAL feasibility study will assess the potential to exploit the deluge of new geo-referenced and time-coded data being generated from various sources to create meaningful, multi-dimension analytics on the urban environment that can be sold on a data-as-a-service basis to facilitate a vastly enhanced home-buying user experience. Led by UK start-up cartographiX, experts in geolocation analytics and machine learning, project activities include supplier engagement/appraisal, systems architecture research, and end user proposition validation and refinement, culminating in a refined business plan."

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<b>CITI LOGIK LIMITED</b>	Real-Time Air Quality and People Movement Data for Worcester (Proof of Concept)	£227,361	£159,153
Bromsgrove District Council		£4,999	£4,999
TRANSPORT SYSTEMS CATAPULT		£52,754	£52,754
Worcestershire County Council		£7,448	£7,448

### **Project description - provided by applicants**

Citi Logik will be using anonymised mobile network data (MND) from Vodafone and the latest generation of pollution sensors to map the movement of people around Worcester City Centre against pollution levels of a key pollutant (nitrogen dioxide) in real-time. For the pilot project, we will be using 4 sensors at key locations and mapping this data against MND on the Citi Watch online portal. These sensors will be procured from EarthSense, a market leading provider of pollution sensors. EarthSense Zephyr sensors are lightweight, robust and cost-effective and provide data in real-time. This will enable Worcestershire County Council, Worcestershire Regulatory Services and other key stakeholders to monitor levels of air pollution across the city in real-time for the first time, whilst allowing measures to be taken to mitigate the impact on the population of Worcester, as well as implement new air quality management measures. The effectiveness of any mitigation strategies will be assessed in real-time. We will be working with the Transport Systems Catapult to assess the impact of any changes in air quality measured during the study period and the potential health benefits to the citizens of Worcester. Should the proof of concept prove to be successful, we will be working with our partners to investigate how this idea could be developed into a more rounded commercial offering to be used more widely in Worcester as well as in other cities in the UK and internationally. We believe this to be the first service of its type.

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>GNOSYS GLOBAL LTD</b>	CableCare 2: Self-repair Subsea Cable Demonstrator	£443,747	£310,623
OFFSHORE RENEWABLE ENERGY CATAPULT		£187,387	£187,387

### **Project description - provided by applicants**

The competitiveness of offshore renewable energy within the UK power generation mix and the economic feasibility of the proliferation of regional, subsea transmission networks is compromised by the failure rates sustained by subsea power cables. Power cable failure in wet environments arises most frequently from damage to the protective sheath or jacket layers allowing rapid water ingress. This is preventable by inclusion of a water blocking material within the cable assembly, although existing solutions suffer from poor performance and added cost due to incompatibility with standard power cable production processes. CableCare2 harnesses the laboratory validated water blocking capabilities of a water swell-responsive polymer blend, which consequently self-repairs to prevent water penetration and to block permeation of any water present, promising major improvements in mitigating cable failure. The material process characteristics align with current cable co-extrusion techniques, to be deployed as a subsheath repair layer and inner water blocking protection. Test cables featuring the subsheath self-repair and inner blocking layers will be subjected to simulated environment performance tests by ORE Catapult, while complementary testing and composition optimisation by the project lead organisation, Gnosys, will deliver enhanced service durability leading to demonstrator cables for prototyping and commercial adoption.

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<b>SEABED SCOUR CONTROL SYSTEMS LIMITED</b>	SISProtect - Self Installing Scour Protection for Offshore Wind Farms	£133,677	£93,574
DHI WATER ENVIRONMENTS (UK) LTD		£53,294	£26,647
N-SEA OFFSHORE LTD		£1,121,319	£672,791
OFFSHORE RENEWABLE ENERGY CATAPULT		£35,056	£35,056
SCOTTISHPOWER RENEWABLES (UK) LIMITED		£211,124	£105,562
SPT OFFSHORE LIMITED		£543,499	£380,449

### **Project description - provided by applicants**

SISProtect will develop and demonstrate a solution to address the construction and O&M costs, health and safety and environmental factors associated with current scour protection systems. Scour is the erosion of the seabed caused by moving water such as those commonly experienced in offshore environments where the sea currents / waves cause sandy seabeds to become eroded around offshore wind turbine foundations and other assets such as subsea cables, etc. SISProtect will provide a cost effective and long term (permanent) solution for this issue which can cost the offshore wind industry significantly if suitable measures are not taken, resulting in higher costs of energy from the offshore wind farm installations. The SSCS Frond Mat system, which are mats of 'artificial seaweed' provides cost, H&S, and environmental benefits whilst providing robust scour protection. This is achieved through: A cost effective scour protection system engineered and installed to the foundation within the safety and security of an onshore facility; improved deployment times when compared with existing solutions; the system requires no ongoing maintenance in contrast to rocks and other 'conventional' methods; no need for large heavy lift / rock dumping vessels thereby reducing diesel usage and opportunities for H&S issues offshore; the environment by utilising environmentally accepted materials to recreate nature's method of scour prevention. Whilst frond mat concept has been field proven in the Oil and Gas sector in water depths of up to and over 100m, it has not been possible to date to model and adapt the Mats deployment methodology specifically for offshore wind farm turbine foundations without an opportunity such as the one being offered by this project. The main consideration for this project is the innovative deployment system, developed by SPT Offshore, that would be incorporated with the foundation during construction and would automatically deploy the Frond Mats during foundation installation. This self-deployment system would therefore eliminate the need for separate offshore operations to install scour protection resulting in significant cost savings, as well as reducing the HSE impact associated with offshore operations. A specific deployment system will be developed to achieve this, along with Frond Mats designed and manufactured to suit the system. Successful completion will see a globally unique solution developed in the UK capable of saving £150-200m for project in the UK alone, comfortably allowing estimating savings in the £billions globally.

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DATATECNICS CORPORATION LTD	Critical Infrastructure Pipeline Protection Systems (CIPPS)	£662,772	£463,940
GLYNWED PIPE SYSTEMS LIMITED		£217,762	£108,881

### **Project description - provided by applicants**

Beyond households, most economic activities, from hospitals and schools to factories and farms, depend on reliable access to clean water. This makes the integrity of the pipeline infrastructure which delivers that water significantly important. Over 6 million kilometres of water pipes exist in the UK, Europe and US, of which up to 65% are over 70 years old. The inability to adequately monitor the structural integrity of these pipes has led to water losses in some countries to be as high as 50% of the total water supply. Water leakage is largely the effect of pipeline and joint failure, corrosion, and other external factors such as subsidence ground movement and accidental damage. Existing solutions employed by the industry fail to detect such effects. Acoustic 'noise loggers' are the most common mechanism but, with limited range due to poor sound transmittance in plastic pipes, they are too expensive to provide comprehensive wide-area coverage. The industry requires predictive systems but current sensors are unable to provide this due to high cost and poor long-distance coverage. As a result, utilities are finding it increasingly difficult to maintain their infrastructure: suffering from repeated pipe bursts, incurring costly fines and missing water leakage reduction targets set by the national regulator, Ofwat. To address this problem, we have developed Critical Infrastructure Pipeline Protection Systems" (CIPPS). CIPPS is a ground-breaking protection system which uses the power of ultra-low-cost, Printed Electronics to provide predictive failure detection and continuous monitoring of pipeline integrity, cost-effectively. Our solution revolutionizes the potential of pipeline infrastructure by embedding an intelligent substrate, enabled with Printed Electronic sensors, to obtain near-real time pipeline integrity measurements over long distances. Crucially, CIPPS is easy to install and manufacture. The system is based on extensive R&D work and prototypes developed using previous Innovate UK grant funding as well as through the Birmingham City Council's 'Regional Growth Fund'. This project will be a step-change in the water industry, in particular asset management control. Predictive failure detection allows for significant reduction in water losses, extending asset lifetimes and lowered health and safety risks by reductions in bursts. Equally importantly, CIPPS will enable water utilities to achieve Zero Leakage targets, avoid costly penalties and reduce CO2 emissions from additional water treatment and pumping activities."

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<b>TEROPTA LTD</b>	Real-time Emission Visualization (REVIS) for Eco-friendly Travel Behaviours	£360,000	£252,000
Brunel University London		£20,200	£20,200
<b>COSTAIN LIMITED</b>		£650,000	£325,000
<b>MOBIBIZ LTD</b>		£248,822	£174,175
University of the West of England		£518,478	£518,478

### **Project description - provided by applicants**

Current methods that predict pollutant emissions by estimating the number of cars on roads are highly inaccurate. This is because the real-world emissions per vehicle cannot be trusted, as the recent VW scandal has demonstrated. Nearly 40 million people in the UK are living in areas where illegal levels of air pollution from diesel vehicles risk damaging their health (ClientEarth 2017). According to the Royal College of Physicians (RCP), there are 40,000 deaths every year due to NO<sub>2</sub>, which has been linked to cancer, asthma, stroke, heart disease, diabetes, obesity, and dementia; resulting in high cost to people who suffer from these illnesses and costing the economy £20 billion yearly (RCP 2017). The population is worried about the issue as, in 2017, 4000 people has used air-pollution monitoring kits in the UK (Friends-of-Earth). Despite the health threats accruable from emissions, no tool exists that visualises NO<sub>2</sub> & CO<sub>2</sub> emissions in real-time. Existing travel navigation assistants (e.g. Google Maps, Apple iOS Maps, Waze, automakers navigation systems, Tomtom, AA route-planner, etc.) do not provide information about NO<sub>2</sub> & CO<sub>2</sub> levels. This project will develop a system for Real-Time Emissions Visualisation (REVIS) for eco-friendly travel behaviour. REVIS will use IoT-sensors to obtain the actual amount of NO<sub>2</sub> & CO<sub>2</sub> emissions on roads and highways and visualise them in real-time. The REVIS system will consists of: (1) REVIS Travel Planner (RTP). This app will visualise in real-time NO<sub>2</sub> & CO<sub>2</sub> emissions on roads providing drivers, commuters, cyclists and pedestrians with accurate emissions levels along their planned journey. (2) Emission Visualisation as-a-Service (EVaaS) is a platform that provides emissions data to navigation and travel planner providers (e.g. Google Maps, Apple iOS Map; Waze, Tomtom, AA route-planner, etc.) so that they can include it on their solutions. (3) REVIS Cities Emissions Map and Monitor (RCEMM) will support local and highway authorities to monitor in real-time actual NO<sub>2</sub> & CO<sub>2</sub> levels. REVIS aims to provide a step-change in decision-making and behavioural change for emissions reduction. REVIS will enable local authorities to devise and test emission reduction policies tailored to their communities.

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URBAN ELECTRIC NETWORKS LTD	Residential on-street Electric Vehicle charging at scale	£357,827	£250,479
ALBRIGHT PRODUCT DESIGN LIMITED		£77,077	£53,954
Oxford City Council		£169,163	£169,163
<b>Project description - provided by applicants</b>			
<p>The electric car (EV) market is reaching an inflection point, however there is an unsolved barrier to EV adoption. In the UK approximately 43% of households (rising to 85% in some London boroughs) are unable to switch to an EV because they have no off-street parking for charging. Therefore there is no certainty of at-home (predominantly overnight) charging, relied upon by EV users today for 90% of all charging. **The lack of at-home charging for residents with only access to on- street parking affects up to 11.6 million households in the UK alone. This will severely limit the scope for future implementation of government policy to encourage the uptake of EVs.** **Urban Electric solves the problem of residential on-street charging by introducing a unique retractable pavement charging bollard that provides discreet, affordable, residential on-street smart grid" ready charging at scale, the first company to do so.**"</p>			

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<b>SENCEIVE LIMITED</b>	LORADDS - Low Power Asset Displacement and Distortion Sensing	£270,982	£121,942
AECOM INFRASTRUCTURE & ENVIRONMENT UK LIMITED		£14,483	£3,621

### **Project description - provided by applicants**

Measuring movement and deformation in civil infrastructure assets including urban buildings, bridges, tunnels, structures and earthworks is a common and vitally important requirement both during any construction works to ensure project productivity, but also critically over the asset lifetime to be able to monitor and assess potential long-term degradation and reduce the risk of failure through predictive and preventative decision making. Typical existing monitoring solutions rely either on mains powered optical sensors and/or the use of other wired and mains powered sensors and instrumentation or even manual methods involving site visits, all of which impose significant limitations in terms of ease and speed of deployment, initial and whole life cost, reliability, precision and repeatability, and frequency of intervention or site visits and safety related issues. The LORADDS project seeks to develop an innovative, digital, autonomous, totally wireless sensor solution for structural and ground monitoring applications which importantly draws upon Senceive's existing wireless sensor platform allied with proven expertise in areas ranging from wireless communications, sensors, and 100's of deployments of reliable electronic systems in tough and challenging Civil, Rail and Construction environments. The project will be led by Senceive Ltd, a high-growth London based SME and will draw on expertise from collaborator AECOM, as well as other multi levelled relationships with organisations including Network Rail and London Underground. The project outputs are targeted at addressing a clear and growing requirement in UK and International markets for smart and resilient infrastructure monitoring solutions which can be quickly and easily deployed to measure displacement and deformation in bridges, tunnels, earthworks and other fixed assets for periods ranging from a few days to potentially decades.

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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.**

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>SAMSUNG ELECTRONICS (UK) LIMITED</b>	OFfSET - Optimised Forecasting for Switching Energy Tariffs	£199,260	£99,630
LABRADOR LTD		£156,892	£109,824
PASSIVSYSTEMS LIMITED		£512,041	£358,429

### **Project description - provided by applicants**

The Optimising & Forecasting for Switching Energy Tariffs OFFSET" project brings Samsung's UK-based Research team together with energy market disruptors Labrador and home energy management experts PassivSystems, along with the support and experience of the BRE. OFFSET will validate a business model which will allow the integration of large electrical appliances to the existing electricity infrastructure whilst minimising the impact on energy bills, or system reinforcement costs. The project encompasses both electricity and gas supply and anticipates the introduction of time-of-use and capacity-based domestic electricity tariffs in the UK to investigate the potential opportunities that this market change could represent through smarter use of heating and appliances. Working together to develop forecasting algorithms for external and internal conditions and behaviour patterns, the OFFSET partners will build from PassivSystems current model to one that predict occupants' energy demands from heating and large appliances. Using this, and with careful correlation prioritising the occupant/consumer's own preferences, the project team will expand the existing delegated tariff switching service from Labrador to trial a predictive switching model including new complex energy tariffs, enabling consumers to be moved to the cheapest gas or electricity tariff in anticipation of their forecast behaviour. OFFSET will allow consumers to access the expected benefits of time-of-use and capacity tariffs without exposing them to the complexity. This model will further integrate with Samsung's SmartThings cloud and Internet of Things (IoT) connected appliances, ensuring that electrical demand from the growing ecosystem of connected devices (from a range of companies) can be factored into, and controlled by, the OFFSET platform. The SmartThings platform has Samsung's defense-grade Knox security technology built-in."

**Note: you can see all Innovate UK-funded projects here**

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# Innovate UK

**Results of Competition:** November 2017 Sector Competition Strand 2:  
Infrastructure Systems - 13 to 24 Months  
**Competition Code:** 1711\_MM\_INFRA\_R4\_ST2\_24M

**Total available funding is £9.5m in total across 3 streams**

**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
INGRAM NETWORKS LTD	10 Gbps+ Train and Metro communications infrastructure to improve urban living	£489,462	£342,623
FORD ELECTRONICS LIMITED		£24,032	£16,822
SHACKERSTONE RAILWAY SOCIETY LIMITED		£126,008	£126,008
<b>Project description - provided by applicants</b>			
This Industrial Research project builds upon a successful Round 1 Infrastructure Systems Feasibility Study which performed lab-based research into a 10Gbps track-side to train (or road-side to road vehicle) communications system. The project exceeded its objectives, and this proposal is for the next stage - taking the work beyond the lab and into a representative environment.			

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# Innovate UK

**Results of Competition:** November 2017 Sector Competition Strand 2:  
Infrastructure Systems - 13 to 24 Months

**Competition Code:** 1711\_MM\_INFRA\_R4\_ST2\_24M

**Total available funding is £9.5m in total across 3 streams**

**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
PEAK NDT LIMITED	High speed inspection of nuclear assets using Virtual Source Aperture techniques and advanced ultrasonic equipment	£557,804	£390,463
TWI LIMITED		£238,886	£238,886
<b>Project description - provided by applicants</b>			
This project seeks to solve the current compromise between information and speed existing within phased array ultrasonic testing, which is restricting uptake of technological advancements in non-destructive testing applications. This project will develop a system which offers users maximum flexibility, to improve productivity and help prevent against unplanned shutdowns.			

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# Innovate UK

**Results of Competition:** November 2017 Sector Competition Strand 2:  
Infrastructure Systems - 13 to 24 Months

**Competition Code:** 1711\_MM\_INFRA\_R4\_ST2\_24M

**Total available funding is £9.5m in total across 3 streams**

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

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>ITM POWER (TRADING) LIMITED</b>	Project Centurion Feasibility Study	£219,416	£131,650
CADENT GAS LIMITED		£7,760	£0
ELEMENT ENERGY LIMITED		£53,164	£37,215
INOVYN CHLORVINYLS LIMITED		£83,700	£41,850
STORENGY UK LIMITED		£52,046	£31,228

### **Project description - provided by applicants**

This project is a feasibility study into a large-scale power-to-gas (P2G) demonstration project. P2G technology aims to solve the challenge of accommodating intermittent renewable electricity generation on the grid by producing zero-carbon fuel. P2G systems respond flexibly to absorb electricity at times when generation exceeds demand, helping the electricity system to accommodate renewable generation which may otherwise be wasted. The electricity splits water into hydrogen and oxygen. The low-carbon hydrogen gas has several uses: as a transport fuel; in industry to displace methane used for heat or fossil-fuel derived hydrogen in chemical processes; and it can also replace some or all of the methane in the gas network to decarbonise heating. P2G systems hold significant potential to help to decarbonise the electricity and gas networks as well as enabling energy storage by absorbing excess energy on the electricity grid and storing it (e.g. in salt caverns), ready to be injected into the gas network. One hydrogen for heat project is underway in the UK; HyDeploy will inject hydrogen into a closed private gas network. Other P2G systems are operating worldwide. However, these projects are generally small scale and in the UK no project has yet injected hydrogen into the public gas network, nor have they trialled the impact of providing grid balancing services on the economics of gas production. Several projects are in place to understand the feasibility of injecting into the gas network and to determine the regulatory changes which would be required. This project aims to explore the options, costs, and key design elements of a large-scale P2G system which could be deployed in Cheshire. The objectives are: to produce sufficient evidence (technical and economic) to enable the demonstration project to be financed and built; to raise awareness of the potential for such systems to transform and decarbonise the energy sectors; and to produce a detailed design for a large-scale electrolyser system. The project partners in this application include ITM Power, a UK manufacturer of PEM electrolysers; INOVYN, a chemical company with hydrogen experience which owns the site under consideration; Storengy, a gas storage company operating a site in Cheshire; Cadent, who operate the local gas distribution network and are promoting the NW of England as an international centre for hydrogen expertise; and Element Energy, a low carbon energy consultancy with expertise in business planning for innovative energy projects.

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# Innovate UK

**Results of Competition:** November 2017 Sector Competition Strand 2:  
Infrastructure Systems - 25 to 36 Months

**Competition Code:** 1711\_MM\_INFRA\_R4\_ST2\_36M

**Total available funding is £9.5m in total across 3 streams**

**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
<b>INTEGRITY NDT LIMITED</b>	PileSense - Innovative ultra-sonic guided wave technology for intelligent sensing of defects in steel sheet pile infrastructure	£474,908	£332,436
Brunel University London		£249,178	£249,178
CH2M HILL UNITED KINGDOM		£75,172	£37,586
JR DYNAMICS LIMITED		£299,715	£209,801
KINGSTON COMPUTER CONSULTANCY LIMITED		£336,330	£235,431
REACH ENGINEERING & DIVING SERVICES LIMITED		£92,261	£64,583
TWI LIMITED		£278,042	£278,042

### **Project description - provided by applicants**

Structural steel is the material of choice in the vast majority of structures in coastal and offshore locations due its combination of durability, ease of fabrication and ability to provide a relatively cost-effective solution. Despite its many benefits, steel is of course prone to corrosion, which is the principal cause of deterioration of steel waterfront structures. However, it has recently been acknowledged that steel piles are significantly more prone to advanced corrosion rates than previously understood. What is now known, is that ALWC (Accelerated-Low-Water-Corrosion) can rapidly compromise the integrity of affected structures and will lead to significant costs for repair or replacement, with major implications for safe operation. PileSense is an innovative solution for corrosion sensing in steel piles, in particular, those sited in marine environments. It is a remote sensing system and that offers rapid and smart assessment of steel piles. Our solution overcomes limitations in state-of-the-art inspection and monitoring systems, which are rudimentary and labour intensive. Protective coatings on the other hand are proven to be unpractical both from an application and maintenance perspective. PileSense will revolutionise the detection of corrosion and defects in steel pile infrastructure for maintenance operators across the globe.

**Note: you can see all Innovate UK-funded projects here**

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# Innovate UK

**Results of Competition:** November 2017 Sector Competition Strand 2:  
Infrastructure Systems - 25 to 36 Months

**Competition Code:** 1711\_MM\_INFRA\_R4\_ST2\_36M

**Total available funding is £9.5m in total across 3 streams**

**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
LICENERGY UK LIMITED	CROWN 2 - Cost Reduction for Offshore Wind Now 2	£189,656	£132,759
E.ON CLIMATE & RENEWABLES UK LIMITED		£115,998	£69,599
EDF ENERGY R&D UK CENTRE LIMITED		£108,016	£54,008
EDF ENERGY RENEWABLES LIMITED		£65,898	£32,949
METALLISATION LIMITED		£77,283	£46,370
OFFSHORE RENEWABLE ENERGY CATAPULT		£91,002	£91,002
Orsted Wind Power A/S		£66,897	£0
SCOTTISHPOWER RENEWABLES (UK) LIMITED		£168,710	£84,355
TWI LIMITED		£241,092	£241,092

### **Project description - provided by applicants**

CROWN 2 builds on a previously-funded project (CROWN) that aims to completely change the way offshore wind foundations are protected from corrosion. While a well-established and robust solution is to use a paint and galvanic anode approach, protection lifetime is limited by paint degradation and anode mass. Such systems are also expensive to manufacture, install and maintain. The consortium will be investigating whether a single coating of aluminium, applied to the surface by arc-spraying, can replace paint and anodes entirely. If successful, such a coating would lower the cost of wind energy, by removing bottlenecks in the manufacture of wind turbine foundations and eliminating a significant amount of secondary steelwork that has to be expensively welded by skilled professionals.

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