Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
BIOME TECHNOLOGIES PLC	BioTGuard : Biodegradable tree shelter	£297,260	£297,260

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

Around 45 million trees are planted in the UK each year. Tree shelters protect young trees and bushes from predation by animals. They are a well-proven and economic route to limiting losses in the first five years of a tree's life. Unfortunately, most are made from oil-based and non-biodegradable plastics. The majority of shelters are never collected and eventually litter the environment with some 2,500 tons/annum of persistent microplastics. Without a sustainable solution, plans to significantly increase tree planting as part of the UK's drive to mitigate climate change will exacerbate this problem.

The project will develop a novel biodegradable tree guard that will reduce (and eventually eliminate) the environmental burden of the current oil-based plastic (polypropylene) design. The ability of these materials to deliver controlled biodegradation will ensure that the shelters degrade within around 2 years, as the tree reaches suitable maturity.

The successful Phase1 feasibility project has allowed Biome to explore the performance of a variety of bioplastic materials in this application and culminated in the manufacture of prototypes at customer's premises. Phase2 will enable: the refinement of material formulations; accelerated weather testing of formulations to over 5 years; correlating laboratory testing with "real world" planting conditions; validating and deepening initial Life Cycle Analysis work; and further building the credentials of the testing protocols with a wider range of industry stakeholders.

The polymers that Biome are using in this project are bio-based and biodegradable. Some are novel and are the result of £6.5 million of investment over six years in research collaboration between Biome and a number of the UK's leading universities. The development of biodegradable tree shelters is the first potential commercial application arising from this collaborative group's endeavours. The polymers used in this particular project are partly based on furandicarboxylic acid (FDCA), a key bio-based monomeric building block. More information regarding the processes for the formation of FDCA can be found on the Company's website, [https://biomebioplastics.com/industrial-biotechnology/][0].

The project will be delivered in collaboration with predominantly UK-based manufacturing and testing organisations. Crucial advice will be sought from leading UK forestry management and non-profit organisations, who will be involved in the prototype deployment (and field monitoring) at various UK locations and international sites.

[0]: https://biomebioplastics.com/industrial-biotechnology/

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
iCOMAT	Lightweight Automotive Fibre-Steered Structures (LeAFS)	£1,936,494	£1,936,494

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
LeAFS focuses on the development and commercialisation of an automated manufacturing process, aiming at introducing the light-weighting benefits of composites in the automotive sector, in a cost-efficient way. During LeAFS, iCOMAT will use its novel manufacturing technology known as Rapid Tow Shearing, to enable the manufacture of composite structures that require fibre steering. These are often highly curved and will be manufactured by pressing a hybrid preform of 2D fibre-steered tapes and random-fibre sheet-moulding-compound (SMC). Phase_2 will deliver a pilot production line (raw material to final part), focusing on R&D to solve existing challenges and develop process elements enabling even greater quality/cost improvements. LeAFS can deliver the new state-of-the-art in automated manufacturing capability for lightweight vehicles and green mobility. LeAFS creates an immediate business opportunity, exploitable at the end of the project, which extends to the UK and European markets.

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: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
PRAGMATIC SEMICONDUCTOR LIMITED	SPRITE 2 - Sustainable Plastics Recycling Innovation by Tagging Electronically	£1,278,347	£1,278,347

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
Plastic packaging waste is a \>$80Bn global opportunity according to the World Economic Forum. Only 14% of plastic packaging reaches recycling plants and only 9% is actually being recycled, whilst 40% ends up in landfill. The UK's Clean Growth Strategy has a goal to reduce emissions from landfill and achieve zero avoidable waste by 2050\. One way to reduce emissions from landfill is to stop the avoidable waste from reaching it. This will be achieved by a combination of actions generally grouped into reduce (removing unnecessary packaging) and re-use (refillable schemes and recycling) categories. Progress on all these has seen a significant setback during the COVID-19 pandemic. Whilst there is rightly focus on reducing the amount of plastic that is consumed it is not practical to eliminate all plastic due to its many benefits including it being lightweight (with associated low transport costs and carbon footprint) and its robustness. It is, therefore, essential to increase recycling rates and quality so that the highest material value is retained for reuse. Most approaches to improving recycling have looked to make the sorting/identification systems smarter, for example using infra-red to identify types of plastics. Relatively little activity has been directed towards making the packaging smarter so that it is easier to identify, sort, separate, reprocess and reuse. Our project focuses on simplifying and increasing recycling of plastics by providing a machine readable unique digital identity onto each pack. This new capability provides a technology platform that can enable a wide-range of different innovations and applications. Deposit-return schemes are already well proven but based on old technology (1990s), relying on returning bottles back to grocery stores in exchange for a deposit slip, which is open to fraud. The legacy systems are only suitable for countries that already have well-developed processes, e.g. Scandinavia, Germany, The Netherlands (all of whom have \>95% recycling-rates). We see an opportunity to develop a modern consumer-focused system that uses smartphones to reward consumer behaviour and improve recycling outcomes. Within the project we will investigate the use of PragmatIC's ultra-low-cost RFID technology to drive improvements within recycling, specifically demonstrating potential use-cases for a digital recycling and reward scheme.

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: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
Texture Jet	Next Generation Processing Technologies for Power Generation: Phase 2	£499,714	£499,714

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 long-term future of UK manufacturing is reliant on sustainability and achieving government targets. However, the need for increased cost efficiency in manufacturing is critical to remain competitive and key for survival and regrowth, which is especially relevant to the midlands manufacturing cluster having been severely impacted by COVID-19\. It is paramount that industry realise, through innovation, not only cost savings but environmental sustainability and clean growth thus creating a more sustainable economy. Therefore, technologies that can achieve all these goals are highly sought. This project is a direct follow on from the Phase-1 feasibility study and is intended to improve business and industry efficiency by providing a sustainable solution to industry pains. Across a wide number of applications, there is a need to modify surfaces of components providing the optimum function and performance. However, current surface texturing and finishing operations across high-value manufacturing are heavily dependent upon dirty, dangerous, and unsustainable legacy processes, with currently no meaningful alternatives available offering a level of performance at cost whilst delivering a sustainability advantage. Finishing processes in high-value manufacturing typically involve acid-based chemical etching and media blasting due to their knowledge base and ease of working difficult materials. Although the hardware is considered relatively low cost, there are significant cost inefficiencies caused by non-value-added process steps, enlarged factory footprint and high operating and infrastructure costs. Additionally, current processes have a significant environmental impact across multiple waste streams and energy usage. TextureJet has the technological potential to replace these legacy processes in their entirety. TextureJet's core technology is a unique, neutral solution electrochemical machining process which offers an innovative and clean solution to address both the economic and environmental constraints of current methods. It can roughen, polish, etch and structure surfaces, without inducing surface damage or the requirement of masking. It has the benefits over prior art of simplicity aiding low-cost scalability, precision, and flexibility. Vitally TextureJet's solution is environmentally sustainable, eliminating use of toxic chemicals only requiring low concentration saltwater solutions, with no dust or fume contamination and can operate at up to 100% machining efficiencies. Uniquely, it can be performed onsite or in-situ, so the production line attributable footprint can be drastically reduced. Through this project, TextureJet will demonstrate the viability of its technology to vastly reduce the environmental impact of finishing technologies by providing a cost-efficient solution where one does not currently exist enabling UK manufacturing to 'build back better'.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
Queen Margaret University Edinburgh	PALM-ALT (phase 2): Novel palm fat replacer for the food industry	£655,256	£655,256

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
Led by the Scottish Centre for Food Development and Innovation (SCFDI) based at Queen Margaret University, the PALM-ALT project aims to provide a game-changing solution to the environmental issues associated with the food industry's dependency on the over-cultivation of palm. The project is led by Julien Lonchamp (lecturer in food science at QMU) and Catriona Liddle (new product development manager at the SCFDI) and is carried out in collaboration with industry partners AAK, Nairn's and Greggs. Due to its unique lipid composition allowing it to be solid at room temperature and its low production costs, palm oil has become the main functional fat ingredient across the food industry, including the bakery sector in which it is used for its texturising, shortening, foam stabilisation and mouthfeel properties. However, due to the devastating environmental impact of palm over-cultivation on deforestation and climate change, the industry is looking for sustainable alternatives. Alongside efforts to develop more sustainable palm cultivation practises, current palm fat replacement strategies have led to a number of commercial products. However their impact and expansion are limited due to health-related concerns including high saturated fat content and the presence of trans fatty acids. The PALM-ALT solution is based on a novel combination of sustainable ingredients (linseed processing co-product and beta-glucan), which when processed in specific conditions is able to mimic palm fat functionality, allowing to replace it with healthier rapeseed oil (low in saturated fat and high in polyunsaturated fat). In 2020 the team completed a phase 1 project which demonstrated the technical feasibility of the approach. This current phase 2 project aims to design prototypes of the novel palm fat replacer and the novel palm-free bakery applications (pastry, cake, biscuit and oatcake) at pilot scale and to test them at manufacturing scale at the industry partners with a view to commercialising the products at the end of the project. The PALM-ALT proposal aims to significantly contribute to a more sustainable food industry by: * reducing its dependency on the over-cultivation and importations of palm fat via the development of healthier palm-free products with potential to capture significant segments of the functional ingredient and bakery markets * contributing to the recovery of the industry partners from the COVID-19 pandemic via the added market advantage of these healthier new products * developing a linseed processing co-product currently used as animal feed (defatted linseed meal from oil extraction) into a high-value ingredient

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: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
NATURBEADS LTD	Cellulose microbeads for biocatalysis applications	£170,479	£170,479

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
For tens of thousands of year humans relied on nature to provide them with clothes and materials for shelter and other uses. This changed in the first half of the 20th century as organic chemistry developed methods to create new synthetic fibers and materials. Plastic rapidly replaced natural fibers for clothing and wood for furniture and many other everyday items. The 21st century might see an inversion of this trend: Stricter environmental regulations and the increasing impact of plastic waste in landfills and in the environment are pushing companies to look for more biodegradable and environmentally friendly materials. In this industrial research project, Naturbeads aims to contribute to this trend by replacing polluting plastic carriers used in biocatalysis processes with cellulose based carriers. Carriers are used in biocatalysis processes to immobilize enzymes to reduce downstream processing costs and improve the enzymes' stability towards different organic solvents in a wide range of temperatures. These carriers are mostly based on synthetic polymers in form of spherical, porous microparticles. Due to the enormous environmental impact of polymeric microparticles (microplastics), the European Chemical Agency is now considering banning plastic smaller than 5mm in all applications. For this reason, industry players are actively looking for more environmentally friendly replacements to plastic microparticles. Naturbeads is scaling up a process to produce cellulose, usually available in fibre form, in a spherical form as a direct replacement for spherical plastic microparticles. Cellulose is natural, renewable and 100% biodegradable. Naturbeads also holds the know-how to tailor the surface, mechanical and optical properties of the cellulose beads to mimic the properties of different polymers. In this project, Naturbeads will work with Prof. Edler of the University of Bath and ChiralVision to optimize the performance of cellulose beads as enzyme carriers. The project brings together the expertise of the Naturbeads team in cellulose beads production and customization with the expertise of Prof. Edler in enzyme immobilization. ChiraVision will validate the outcome of the process by testing selected carriers and enzyme/carrier combinations in small scale industrial processes. The immobilized enzymes will be tested for their activity, selectivity and stability in standard tests like hydrolytic and esterification reactions as well as their leaching behaviour to evaluate their recyclability. The project's goal is to produce a scalable protype that Naturbeads will manufacture (with a scale up partners) and ChiralVision will commercialize as a green solution for the biocatalysis industry.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
RESEARCH BY BRITISH LITHIUM LIMITED	Pilot Scale Production of Lithium from UK Granites; transitioning to an electric vehicle future post Covid-19	£2,902,126	£2,902,126

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
BLL has identified a substantial lithium-mica-granite Resource in the UK, but lithium has never been commercially extracted from mica. Mostly academic work has previously proposed chemical froth flotation of lithium mica and hot sulphuric acid leaching to extract the lithium, which would produce millions of tonnes of contaminated residues. BLL has developed novel technologies for extracting lithium-mica from granite, and for extracting the lithium at low temperatures and neutral pH that don't require toxic chemicals, potentially offering the lowest environmental footprint of any world lithium producer. We have the UK's only dedicated lithium laboratory, with advanced equipment for comminution, beneficiating, pyrometallurgy and hydrometallurgy. Our Pilot Plant will refine and validate our novel technology, eliminate scale-up risk, and produce representative product for testing and validation by potential customers. In 2020 UK car sales fell 55% for diesel and 39% for petrol, whereas EV sales increased 188% to 29% of total sales. December's largest selling car was the imported Tesla Model 3\. Carmakers co-locate with battery makers. Just one Gigafactory is currently proposed in UK whereas €60 billion has been invested in electric vehicle manufacture in Europe, including 15 gigafactories under construction. The first EV designed in UK (Jaguar's I-Pace) is made in Austria with Polish batteries. To transform the whole UK car industry from internal combustion to EVs would require seven Gigafactories. _Benchmark_ predict world demand for lithium carbonate for battery materials to grow from 140,315t in 2020 to 1.74Mt by 2030, requiring significant new production. The UK Government's "_Ten Point Plan for a Green Industrial Revolution_" effectively mandates the development of a local lithium-battery supply chain New measures include: • Moving forward the ban on internal combustion only vehicles to 2030; • £1 billion to support the electrification of UK vehicles and their supply chains, including developing "Gigafactories" to produce the batteries needed at scale; • £1.3 billion to accelerate the roll-out of charging infrastructure; and • £582 million to extend the Plug-in grants. Subject to successful pilot production, our proposed quarry and refinery would currently offer Europe's only domestic supply of lithium, potentially placing the UK at the forefront of the integrated manufacture of lithium chemicals, batteries and zero-emission vehicles, supporting the green-led recovery of the UK's automotive sector from the dramatic losses due to Covid-19, and the disruptive change from internal combustion to electric mobility. Our proposed quarry and refinery would alone meet one-third of Britain's requirements.

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Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
IMPACT RECYCLING LIMITED	BOSS - Medical Waste	£2,985,619	£2,985,619

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
This project seeks to carry out the development of a prototype plant that utilises Baffled Oscillation Technology to recycle a stream of sterilised clinical medical waste from an NHS Scotland contract. A technical feasibility assessment was carried out on a lab scale rig and proved the viability of recovering high value polymers from currently incinerated medical waste. The project will see the design and prototyping of a highly innovative & first to market process that will divert significant volumes of NHS medical waste from incineration, directly saving up to 87,500 tonnes of CO2 emissions annually based on this NHS contract alone.

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: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
MAS DESIGN PRODUCTS LIMITED	A Zero-Carbon Transport for post-COVID needs	£986,160	£986,160

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
Our aim is to produce a folding bicycle as ubiquitous as a mobile phone. Compact, like hand luggage, you can take it anywhere: roll it when folded and ride it outside, shrinking distances by human or electric power. A bicycle/e-bicycle transformed by innovation and value engineering from a cumbersome, agricultural 'device' for enthusiasts into a desirable, 'must have', affordable product for everyone. THE perfect portable 'human amplifier'. Our proposal for phase 2 and beyond is for 'A radically new folding bike/e bike to meet huge global post Covid needs and be made in UK' . This follows on from phase 1 where we proved it is feasible to make a frame, in the UK for a fraction of the cost of traditional frames. A product that will exceed expectations and delight users more than any similar products currently in the market. We intend to show this revolutionary new bicycle at COP26\. Benefits include: * Larger wheels, and stiff frame - for easy, great riding and appeal. * Smaller and lighter when folded - for easy transporting and storage. * A clean smooth design - for appeal as a consumer product. * Affordable - to enable many to buy and benefit from its advantages. The sales of bicycles and e-bikes have soared during Covid-19 by offering healthy, personal transport that avoids infectious enclosed spaces. It is clear that bicycles can deliver pollution free urban transport, benefitting environmental sustainability, climate change and congestion. Bicycles have been given space and a renewed prominence in most towns and cities. Folding bikes are also portable, theft-proof, easy to store and can be taken on trains, buses and in cars. After years innovating products, we aim to bring our experience, best ideas and most importantly _value engineering,_ into this folding/e-bike project. We believe that to be really transformational and offer positive benefits to society, great products _must_ be affordable and accessible to as many people as possible. Based in the UK, this project will benefit from the huge global demand for bicycles, whilst leveraging the UK's leadership in innovation, value engineering and its automotive industry volume manufacturing capability. Combining a radical new folding geometry and cost focused UK innovation and manufacturing, we plan to transform the old UK bicycle industry and society as a whole, by giving more people the choice of better zero carbon transport.

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Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
LIBERTINE FPE LIMITED	Variable compression ratio range extender optimised for heavy duty vehicles with renewable fuels	£2,559,336	£2,559,336

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 proposed 12 month project will develop and demonstrate a variable compression ratio range extender engine optimised for heavy duty vehicles with renewable fuels, building on findings from the successful feasibility study demonstration completed in Phase 1\. In Phase 1, discussions with potential future customers identified the need for a performance validation prototype engine as the next key milestone on the path to commercialisation of Libertine's 'intelliGEN' Opposed Free Piston development platform. In Phase 2 a performance validation engine will integrate Libertine's 'intelliGEN' platform with subcontractor MAHLE Powertrain's MJI passive pre-chamber internal combustion systems, and will implement multiple enhancements for thermal management, durability and electrical power conversion efficiency in order to achieve extended test operating durations and validate performance against customer requirement specifications. Libertine's 'intelliGEN' Opposed Free Piston development engine systems provide the means for OEMs to develop new products making full use of renewable low carbon fuels. These products will be essential for the decarbonisation of 'hard to electrify' transport applications including heavy duty commercial vehicles, heavy duty off-highway vehicles, for a proportion of light duty commercial vehicle and passenger automotive segments where vehicle use and recharging constraints are a barrier to electrification, and for a larger range of distributed power generation applications. The variable compression ratio and non-sinusoidal piston motion capabilities of Free Piston Engines have the potential to enable cleaner and more efficient use of renewable biofuels and synthetic low carbon 'e-fuels' owing to the combustion characteristics of these new fuels. In particular, renewable alcohol fuels such as bioethanol have a high heat of vaporisation and whilst generally clean burning, with fewer harmful emission than gasoline, can produce increased hydrocarbon emissions at cold start due to un-vaporised fuel on cold chamber surfaces ('wall wetting') resulting in persistent misfiring. Phase 1 demonstrated that this negative impact can be reduced using an elevated compression ratio during the first few seconds of cold-start operation to compensate for heat loss from the air/fuel mixture. Many of the new commercial vehicles sold in 2030 will still be on the roads in the UK and worldwide by 2050\. To meet the objectives for net-zero transport in 2050, it is therefore essential that the majority of commercial vehicles sold in 2030 are compatible with net zero carbon fuels for those journeys, and use cases, where recharging is not yet economic, practical or convenient.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
SPRCOE LIMITED	Verification of Recycled Content - protecting the UK supply chain	£752,876	£752,876

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
In 2019 the UK government announced plans to introduce a tax on all plastic packaging which does not contain at least 30% recycled content, now known as the "plastic tax". This tax, which will start in 2022 will impose a £200 tax, per tonne of plastic, on all brands placing plastic packaging in the marketplace, unless recycled content of over 30% is used. While this has the potential to generate significant revenue for HMRC, or increase the value of plastic recyclate, hence making a step change in the value of plastic recycling which will increase the numbers of plastic recyclers throughout the country, there is no current method to analyse the amount of recyclate within a plastic product. As a result, UK manufacturers, who can be audited via purchase records from HMRC, face competition from imports of plastic packaging from overseas where purchase records of recyclate cannot be verified, or from unscrupulous local operators who falsely declare the origins of their material. This project seeks to close this blind spot by providing an internationally recognised method/standard for determining the % content of recyclate within a plastic product, by bringing together the Scottish Plastic Recycling Centre of Excellence (SPRCOE) and the British Standards Institution (BSI), both of whom stand to gain from this new service/product, while also protecting the revenues of HMRC, support packaging manufacturers and kick start the plastic recycling industry in the UK.

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Competition Code: 2012_SBRI_SIF_PH2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RIVER LANE RESEARCH LTD	Anian Virtual Lab	£2,236,446	£2,236,446

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 UK government has recently identified several important industries for significant investment and innovation. These industries are vital for the UK's future economic, social, and environmental prosperity. The government has also set ambitious environmental targets, including the achievement of net-zero emissions by 2050 to end the UK's contribution to global warming. One of the identified industries is battery technology. Some £246m has been allocated to the Faraday Battery Challenge, addressing research in areas such as battery materials identification, enhancement, and recycling, while £153m has been allocated to quantum technologies, including the enhancement of conventional computers with quantum computing capabilities. This is a fundamentally different approach to computing, using the properties of quantum systems to provide massive improvements in computational speed and accuracy. However, as for many industries, battery and quantum technologies have suffered disruption due to the Covid-19 pandemic. This has stalled research progress and made it harder to future-proof the batteries industry through engagement with disruptive technology like quantum computing. Our project uses quantum computing to address a long-standing bottleneck faced by researchers who develop battery materials. They find it challenging to accurately and efficiently identify and screen new battery materials. Current methods are very unreliable and involve a 'trial and error' approach. It takes several years to verify new battery materials in the lab. This is highly costly and time-consuming for a materials development company. Global annual spend on materials screening, selection, and performance testing exceeds £40bn (Boston Consulting Group 2019). We will create, develop and commercialise a quantum-enhanced battery materials screening product. It will be set up in a 'virtual lab' environment, so that researchers do not need to be physically present in a lab to conduct their research during the pandemic. To check that it works, we will integrate our product into the existing workflows of UK company Johnson Matthey, a global leader in sustainable technology. We will therefore create an unrivalled _quantum-ready_ product, "Anian Virtual Lab", to help UK business and provide commercial advantage in these challenging times. More broadly, our ambition is to create a game-changing product for major battery materials companies to make their research easier and quicker. This will lead to more sustainable technology and help protect the climate and environment for generations to come.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LIGHTRICITY LIMITED	Sustainable, wireless asset-tracking and monitoring system for hospitals and supply-chains using self-powered sensor beacons	£1,318,456	£1,318,456

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
This project involves delivering demonstration of a self-powered network of sensing and communicating beacons/trackers that enables the location and status monitoring of assets in hospitals thus reducing lost time of healthcare professionals and enabling life-saving equipment to be easily located and usage to be optimally managed. It applies Lightricity's world leading commercially available low-light indoor photovoltaic (PV) technology and modular wireless trackers/beacon design in devices that can be deployed in other vendor's networked systems thus providing a much improved and scalable service to customers such as hospitals. It addresses practicality and user experience by making tracker instalment a fit-and-forget operation. By being completely battery-free it reduces costs associated with maintenance e.g. battery change. It helps healthcare systems operate more efficiently locating critical equipment and monitoring status/condition of tracked items thus saving money and lives, relieving the current pressures and helping prepare for future periods of high demand. It is sustainable in the sense that it reduces workloads in overstretched public health systems and addresses power challenges with a renewable energy source thus avoiding the environmental issue of disposal of billions of batteries. The project also addresses operation in additional vendor systems and use-cases in business logistics and retail operations. The phase 1 project clearly highlighted that for our solution to be commercially successful there is a need to ensure compatibility with multiple routes to market and different vendor technical solutions given the different business models operating in provision of IoT systems. Selected use-cases are for system integrator customers that have already explored solutions with end-users and found battery power to be a critical barrier to adoption. Phase 2 SBRI aims to demonstrate the ability of the Lightricity PV-powered tracker and sensor devices to deliver on all of the compatibility and operational use-case aspects required by the overall IoT system suppliers (Sony, Codegate, Foresolutions) so as to be accepted for inclusion in their particular hardware packages.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

Total available funding is £27,724,151

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
KORN WALL LIMITED	SCREENswitch: Switchable Opacity Patient Isolation Systems Phase 2	£1,213,840	£1,213,840

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 COVID-19 pandemic has made social distancing mandatory in hospitals. Healthcare staff are currently utilising a number of measures to answer to this, including hygienic partition screens. However, these screens are limited by being either solely opaque or solely transparent. Opaque screens are needed when a patient requires privacy, but hospital staff also need visibility over the patient in order to monitor their wellbeing. It's also crucial for the patient to be able to see the rest of their ward and not feel secluded; the negative mental health consequences of which have been well documented (Texas A&M University). To meet this challenge, some hospitals use disposable curtains. But curtains are not sufficient as an infection control barrier, with 92% of curtains testing positive for contamination within 1 week of being put in place. Furthermore, 90% of curtains used in NHS hospitals are made of disposable polypropylene, disposed of by incineration or landfill every few months, which damages the environment. SCREENswitch provides an integrated solution to all of these challenges in the form of a hygienic, retractable partition screen that can change opacity at the touch of a button. Harnessing cutting-edge smart film technology, SCREENswitch is an effective infection control measure that gives patients the choice over privacy or visibility. As a multi-use screen, it promises to be less impactful on the environment than other infection control alternatives. KwickScreen has over 10 years experience in designing and manufacturing portable, retractable partition screens, predominantly for healthcare environments, with sales to every NHS trust. In Phase 1 of the project, we proved that it was feasible to make a retractable screen using smart film technology. In Phase 2, we'll be focusing on five main technical areas: material testing and development, prototype development, in-hospital testing, manufacturing process design, and environmental impact assessment. By the end of this phase, SCREENswitch will be ready for commercialisation and use in hospitals.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
LIBERTY POWDER METALS LTD	Development of Atomiser Nozzle Design to increase Yield (DANDY 2)	£2,184,962	£2,184,962

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
Additive manufacturing (AM) of aerospace components create opportunities for lighter weight and higher performance parts which could significantly reduce both manufacturing waste (lower buy-to-fly ratio) and the weight of an aircraft. This will result in fuel savings, operational costs and decrease carbon emissions, thereby benefiting our environment. We do not anticipate a change to the crucial parts of the aircraft, such as the wings and fuselage in the near future but there is real potential in the replacement of less flight-critical parts, such as brackets, clamps, hinges, seat buckles and furnishings. To produce a 1kg bracket for an airplane, for example, requires 10kg of raw material input into the manufacturing process. From an engineering design perspective, that final bracket may still contain much more metal than is required for the application. 3D printing, on the other hand, requires far less raw material inputs and can further produce parts that minimise weight through better lattice type design. Current sub-optimal designs are due to the limits of conventional manufacturing. When we make something in layer-by-layer fashion as in AM, those constraints diminish. One of the biggest barriers to the aerospace industry fully adopting additive manufacturing, according to companies we have spoken to, is the cost and availability of the powder metal. The 15-45 micron fraction used in AM is only approximately 40% of the production. If the atomiser nozzle can be designed to increase this fraction to 50-60% the price significantly reduces and availability increases, making it more viable for aerospace components. Liberty Powder Metals (project lead) and the Materials Processing Institute (subcontractor) have employees with over 30 years experience in the metals industry who have been involved in redesigning basic oxygen steelmaking, oxygen lance nozzles, using audiometry, physical, mathematical modelling and working closely with the nozzle manufacturer to successfully improve refining of the steel bath and to maximise the amount of scrap melting to make the process more efficient and economically viable. The same people and skills together with the University of Leeds will be used in this project to use modelling and audiometry to investigate the feasibility of modifying the atomiser nozzle. This project will help deliver on the government's [Clean Growth Strategy][0] and [net zero ambition][1] to protect the climate and environment for current and future generations by reducing waste from the manufacturing of aerospace components, light weighting of aircraft and reducing fuel consumption. [0]: https://www.gov.uk/government/publications/clean-growth-strategy [1]: https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Extronics Ltd	Covid-19 worker safety tag with social distancing warnings and contact tracing functionality .	£388,170	£388,170

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Project description - provided by applicants
Instances of Covid-19 worldwide are still increasing at an alarming rate - the global pandemic is not going away quickly. Although a vaccine is available and is being rolled out free of charge in the UK, this isn't the case in many other countries. It is unknown how long it will take to vaccinate the world population and therefore it is highly likely that social distancing and contact tracing will need to remain in place for many years. Facilitating safe working is still key to getting economies back up and running. The benefits of contact tracing and prioritising testing of operatives who have had encounters with a confirmed case have proven to be useful and practical to organisations. Extronics has designed the world's first hybrid technology tracking tag for hazardous area Zone 0, 1 and 2\. Approaches to customers have demonstrated that there is notable interest in this integrated solution within the hazardous area segment. For the second phase of this project we will be producing prototypes that use alternative low-power backhaul technologies, creating an API from our location selector to other GIS, adding anti-microbial additives to the ATEX polymer and creating a multicharger capable of dispensing Cold Plasma as a cleansing agent.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SYLVERA LTD	Accurate Above Ground Biomass Estimation using novel hierarchical datasets to train Machine Learning Models	£1,565,341	£1,565,341

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Project description - provided by applicants
The world's current understanding of how much carbon is stored in the Earth's forests has been shown to be **fundamentally inaccurate**, with **serious implications for the fight against climate change.** These issues have real world impact. The world needs Nature Based Solutions projects (i.e. reforestation, forestry protection etc.) **to scale more quickly**. The Paris Agreement set a 2 degree warming scenario. We are currently on track for a 3 degree warming scenario, with all the catastrophic consequences this entails. All the various players in the Carbon Market (project developers, brokers/intermediaries and sellers) **need accurate, validated data to ensure frictionless, increased trade, proving their net zero claims.** However, **current** measurement techniques rely on **outdated and biased carbon estimations** which approximate biomass, and hence carbon, from tree diameter and height and inaccurate sampling. Machine Learning (ML) models offer the capability to accurately estimate Above Ground Biomass (AGB) from the current and imminently available raw Satellite Earth Observation (EO) data at a global scale. **However, they need accurate, well-calibrated training data** with which to train ML models with, **which is currently absent and is the focus of the project.** The **currently** available data to train models that infer AGB from satellite EO data is "inventory derived AGB data". This is gathered by manually measuring two standard parameters: tree diameter and tree height, and then estimating the tree volume and hence biomass using an allometric model which relates those tree measurements to volume, with a simple linear model. **This process does not accurately quantify biomass** and has recently been demonstrated to exhibit systematic bias (**up to 50%**) for quantifying carbon in large trees \[7\], which dominate the stores of carbon in forests. Likewise, very recent approaches using Space or Airborne LIDAR and the forthcoming ESA BIOMASS Synthetic Aperture Radar (SAR) mission, offer potential for excellent AGB inference accuracy \[6\], but are also constrained by the **low accuracy of ground measurements**. This is an exciting £1.5 million project led by Sylvera in conjunction with its partners **University College London and the NASA Jet Propulsion Lab** to push forward the state-of-the-art in Earth Observation technology. The team will capture accurate data on the carbon stored in the world's forests, with the aim of revolutionising global carbon markets, allowing them to **scale and support billions of dollars of forest restoration and planting.**

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
NPL MANAGEMENT LIMITED	Online H2 Quality Service	£1,926,216	£1,926,216

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 National Physical Laboratory (NPL) is the UK's National Measurement Institute and is a world-leading centre of excellence in developing and applying the most accurate measurement standards, science and technology available. For more than a century, NPL has developed and maintained the nation's primary measurement standards. These standards underpin an infrastructure of traceability throughout the UK and the world that ensures accuracy and consistency of measurement. Hydrogen is used extensively in industry and is already sold commercially as a zero-emission fuel for busses and passenger cars. In the near future hydrogen use will expand in the UK and abroad as new zero emission fuels to heat homes and power vehicles, particularly heavy duty vehicles such as buses, HGVs, trains, ships and aeroplanes. When it's used to power fuel cell electric vehicles (FCEV), the hydrogen needs to be very pure, as even trace amounts of impurities can impact the vehicle's performance (performance loss, shorter range or lifetime). NPL is a world leader in accurate measurement of impurities in hydrogen fuel and offers a commercial service where hydrogen fuel is sampled from the HRS and sent for analysis at NPL using sophisticated and sensitive instruments. This service is already used by HRS operators to periodically check that the hydrogen they sell commercially meets required standards. Unfortunately, the process is expensive, slow to return results and generally won't be suitable when there are 1000's of HRS across the UK and Europe (expected before 2030). A much more rapid and cost effective approach is needed. In this project NPL will develop a novel low-cost online H2 fuel quality monitoring system that will trigger a warning when any impurities that could damage a fuel cell reach critical levels. These systems (composed of two sensor types) will operate continuously at a HRS, taking small samples from the station's hydrogen supply. NPL scientists will then only need to take a sample back to the laboratory for a full analysis when a problem is detected. HRS operators will also be able to know immediately if there is a problem with the hydrogen they are selling and act as necessary. This innovative solution is a significant improvement over current practice and will lead to lower priced zero emission fuels and provide consumers with greater confidence that the fuel they are buying meets internationally recognised specifications.

Results of Competition: The Sustainable Innovation Fund: SBRI Phase 2

Competition Code: 2012_SBRI_SIF_PH2

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLEX MARINE POWER LTD	Unlocking scalable tidal wealth: clean growth for the coastal zone	£1,867,053	£1,867,053

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Project description - provided by applicants
The UK has some of the best tidal resources in the world. However, to-date, this predictable, indigenous, clean energy has remained largely untapped, due to the non-commercial cost of tidal energy technology. FMP is developing SwimmerTurbineTM, a 50kW tidal turbine that delivers a scalable, affordable solution, unlocking the tidal energy opportunity through key innovations, leading to breakthrough metrics. This project now allows us to move quickly to a commercially ready machine.

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