Innovate UK

Results of Competition: Newton - UK-India Industrial Biotechnology (BBSRC)

Competition Code: 1706_CRD1_NEWTON_INDBBSRC

Total available funding is £8 million - £4m Innovate UK and £4m BBSRC

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
Manrochem Limited	BIOREVIEW: BioREfining Value from Industrial Waste.	£573,714	£401,600
Fre-Energy Limited		£142,083	£99,456
LCA Works Limited		£301,586	£211,110
Membranology Limited		£420,445	£294,313
Aberystwyth University		£635,234	£635,234
Bangor University		£349,909	£349,909

Project description - provided by applicants
BIOREVIEW is a biorefining collaboration between industry and academics in UK and India that aims to develop innovative economically viable pilot scale industrial biotechnology (IB) processes to produce value added products from waste streams (spent wash (SW) from ethanol production and sugarcane bagasse (SCB) fibre) of the Indian sugarcane industry. Volatile fatty acids acetic, propionic and butyric acid with a predicted market value of £11.9Bn will be produced from SW and xylitol, a diabetic compatible sweetener that prevents tooth decay, will be produced from SCB that has a predicted market value of £1Bn by 2025. Microcrystalline cellulose for food and pharmaceutical applications will be produced, along with depth filters for pollution abatement, from residual SCB fibre. It is envisaged that the integration of these IB biorefining processes into Indian sugar mills will be of economic, environmental and societal benefit to both industry and the Indian population.

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Nova Pangaea Technologies (UK) Limited	Valorising Waste from Sugar Cane and Associated Industries via Innovations in Pre-treatment, Biotransformation and Process Intensification [vWa]	£638,418	£446,893
Green Fuels Research Ltd		£610,333	£427,233
Cranfield University		£349,994	£349,994
Queen's University Belfast		£399,987	£399,987
Nottingham University		£249,941	£249,941

Project description - provided by applicants
The sugar cane industry in India supports nearly 60 million farmers and their families. The sugarcane and allied industries however produce significant solid and liquid waste (~100 million tons). The huge quantities of waste pose a significant challenge as well as an opportunity. The vWa (valorising waste) project aims to innovatively transform these wastes into transportation fuels and value added chemicals. A consortium of two industries & three universities from UK and three industries & four research institutes from India will collaboratively develop novel technology for cost effective pre-treatment, conversion and separations. The technologies, which will realise a step change in the state of the art, will be commercialised by leveraging consortium's industry connect. The developed solutions will make tangible & significant beneficial impact on wellbeing of a large population in rural India. The vWa technologies will establish Indo-UK leadership in biofuels and biochemicals technology sector

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Advanced Microwave Technologies Ltd	Economic non-food sugar from variable mixed solid wase for high value chemical products	£300,570	£210,399
Fiberight Limited		£303,956	£107,732
University of Leeds		£475,605	£475,605
University of Manchester		£123,623	£123,623

Project description - provided by applicants

This highly collaborative UK-India academia-industry project aims to translate into an India context existing technology for converting the biological fraction of mixed solid waste into non-food sugar that can be used in a wide variety of sustainable and biogeradable products such as binders in the construction industry, bioplastics, fermentation and pharmaceuticals. The bio-waste in India presents problems of collection, segregation and unfavourable composition the project will develop new pre-treatments, better enzymes and a process adaptable to different bio-wastes and capable of generating energy to power the plant and sell. A focus of the project is to make the sugar for the right cost and quality. A pilot plant will be developed to produce to samples for target markets and production data suitable for investment cases into full-scale plants. The project will impact upon waste collection people and methods, regional authorities and companies, to help reduce environmental burden, create wealth through new MSW plants, sale of non-food sugar, and develop biocatalysts and processes that can be used elsewhere in the world particularly developing countries.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
C3 Bio-Technologies Limited University of Manchester	Integrated biorefinery for converting paper mill waste into chemical wealth	£416,499 £413,296	£291,549 £413,296

Project description - provided by applicants

India is the fastest growing paper market in the world (6, alongside this trend is the huge amount of industrial waste, especially lignocellulosic material that accumulates as part of this expanding industry. This proposal addresses a number of urgent problems relevant to India, including a) a strengthening of the countries economic position through the emerging bioeconomy, b) the need to tackle major and growing environmental waste management challenges and c) addressing countrywide poverty prevalence through new employment. Our team will develop an innovative biorefinery and commercial strategy to establish a demonstrator platform for the sustainable conversion of paper mill waste into high value chemicals. This platform will be used to drive sustainable expansion through commercial inward investment. This technology will lead to reduction in industrial waste/pollution, and improve value recovery from waste in the paper and pulp industry sector. The proposal will strengthen India's economic position, address major waste challenges and tackle rural poverty.

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Jesmond Engineering Limited	Reducing industrial waste from sugarcane processing in India	£502,342	£351,639
Wilson Bio-Chemical Limited		£487,171	£341,020
Prozomix Limited		£367,644	£257,351
The BioRenewables Development Centre		£111,052	£111,052
University of York		£700,420	£700,420

Project description - provided by applicants
India is the second biggest sugar producer in the world and waste from sugar mills cause considerable industrial pollution, particularly in waterways near processing plants. Although India has strong environmental regulations, enforcement of these has proven difficult. The aim of our project is to use waste streams from sugarcane processing as a feedstock to produce the valuable bio-based chemical citric acid which has a large and growing global market for use in the food, beverages and cleaning products sectors. We will use sugars, released from the polysaccharides that comprise the particulates in sugarcane process waste water, and the large scale woody residues from sugarcane bagasse and cane tops, to power fermentation by Aspergillus niger to produce citric acid. To enable this our consortium will develop new industrial reactors in whci to process sugarcane residues to sugars. We will develop new enzyme cocktails that can be produced locally in sugar mills to be used in these bioreactors. We will also develop new strains of Aspergillus able to produce citric acid at a competitive price from the complex sugars released from sugarcane biomass.

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