Alberta Innovates Bio Solutions

News Release

www.bio.albertainnovates.ca

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Alberta Innovates Bio Solutions awards $1.3 million for six bioindustrial research projects

Projects support green building products, bioplastic and biochar

EDMONTON... Alberta Innovates Bio Solutions is funding six new bioindustrial projects through its Bioindustrial Research and Innovation Program 2012-13. This targeted program aims to stimulate development of new bioindustrial products and processes from biomass and may lead to new business opportunities for the forest and agricultural sectors in Alberta and Canada.

"The projects funded through our Bioindustrial Research and Innovation program hold great promise for increasing economic activity in Alberta's bioindustrial sector, helping to strengthen and diversify our provincial economy," said Dr. Stan Blade, Chief Executive Officer of Alberta Innovates Bio Solutions (AI Bio). "Blending forest or agricultural fibre with existing materials or using the fibre in innovative ways may lead to products that are environmentally sustainable with desirable market qualities."

Representing more than $4.3 million in total project costs, six applied research projects, all with a strong connection to Alberta, were selected to receive a combined total of more than $1.3 million from AI Bio over 2013-16. With team leads located in Edmonton, Calgary, Fredericton and Ottawa, researchers in the six projects plan to use renewable wood or agricultural fibre in ways that may lead to a variety of innovative products or processes including bioplastics for automotive, packaging, or biomedical industries, and biochar for removal of contaminants from oil tailings water. Other projects will focus on developing green biocomposite building products like high-strength, low-weight, foam-core sandwich structures, low-cracking concrete, high-performance cross-laminated timber panels and building-code-certified structural insulated panels from oriented strand board.

Alberta Innovates Bio Solutions is a board-governed research agency funded by the Government of Alberta that leads and coordinates science and innovation to grow prosperity in Alberta's agriculture, food, and forest sectors. Additional information is available about the program at www.bio.albertainnovates.ca/funding/bri2012 and about the projects at www.BioLINK.albertainnovates.ca.

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Backgrounder: Project Details

Media inquiries or requests for interviews may be directed to:

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Alberta Canada

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Alberta Innovates Bio Solutions' Bioindustrial Research and Innovation Program – Project Details

The Alberta Innovates Bio Solutions' Bioindustrial Research and Innovation program aims to stimulate development of new bioindustrial products and processes from biomass that may lead to new business opportunities for the forest and agricultural sectors. Representing more than $4.3 million in total project costs, the following six projects will receive more than $1.3 million from AI Bio over 2013-16.

Project Description	Principal Investigator	Total Project Cost	Alberta Innovates Bio Solutions Funding
Project No. BRI13020 Preparation of Ziegler Natta Catalysts on Nanocrystalline Cellulose (NCC) Surfaces and In Situ Polymerization of Polyolefin Nanocomposites	Dr. Yaman Boluk University of Alberta Edmonton, AB	$ 303,000	$216,000

In this three-year applied research project, Dr. Boluk's team will develop a technology that allows incorporation of high performance nanocrystalline cellulose (NCC) particles into polyolefins by in-situ polymerization process. In this way NCC will disperse homogeneously in polyolefins without lumping and open a pathway for creating polyolefin nanocomposite products. NCC is wood fibre processed into nanoscale rod-shaped particles. Polyolefins such as polyethylenes are petrochemical products used in plastic wrap, bottles, automotive parts, pressure pipes, oil tanks and drums. This type of bioplastic product has potential to be lightweight, very strong, non-toxic, easily recyclable and would be of great value to the automotive, packaging, and biomedical industries.

Project No. BRI13027 Nanocrystalline cellulose (NCC) reinforced foam-core sandwich composite structures	Dr. Cagri Ayranci University of Alberta Edmonton, AB	$ 411,300	$240,000

In this three-year applied research project, Dr. Ayranci's team aim to develop a lightweight composite sandwich structure using nanocrystalline cellulose-reinforced polystyrene foam core that is permanently bonded between two stiff laminae. This green building product will be high strength, low cost, and can be assembled without need for welding. It will also have high insulating qualities, high design tailorability and will be of great interest to the construction industry for many uses beyond the traditional composite panels and boards. This product would also be valuable to the automotive and aerospace industries.

Project No. BRI13032 Development of Agri-Fiber Based Reinforcement of Concrete Materials	Mr. Richard Bueble Canadian Greenfield Technologies Corporation Calgary, AB	$ 621,339	$260,000

In this 13-month applied research project, Mr. Pildysh's team aim to develop a new concrete material that is high value, high performance with low cracking characteristics and is effective in technically demanding, regulated concrete construction applications. Cracking is one of the most prevalent warranty claims for concrete manufacturers, resulting in substantial costs to the industry. The new concrete material reinforced with agricultural fibres would be low cost, easy to manufacture, have a low carbon footprint and exhibit reduced cracking.

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Project No. BRI13036 Development of a Lumber-SCL Massive Wood Plate Product	Dr. Ying-Hei Chui University of New Brunswick Fredericton, NB	$ 308,000	$150,000

In this two-year applied research project, Dr. Chui's team aim to develop the next generation of high performance engineered massive timber product (MTP) panels by bonding layers of structural composite lumber (SCL) or a combination of structural composite lumber and dimensional lumber. This new product, which is an evolution of an existing engineered wood product, known as cross laminated timber (CLT), will be suitable for mid- to high-rise and non-residential building applications. CLT is attracting attention from the global construction industry as wood-based building products use renewable materials, require low energy to produce, allow high design flexibility, and are easy to prefabricate in the factory then transport to the construction site.

Project No. BRI13041 Development of a Technical Guide for the Evaluation of Oriented Strand Board Structural Insulated Panels (SIPs) for National Building Code compliance	Dr. Jon Makar National Research Council Canada Ottawa, ON	$2,007,000	$180,000

In this three-year applied research project supported by many industrial partners from across Canada, Dr. Makar's team will assess the long-term performance of oriented strand board structural insulated panels and then develop a technical guide for the Canadian Construction Materials Centre (CCMC). SIPs are a factory-produced green building material for walls and roofs in housing. Major advantages of the technology for the developer and contractor compared to traditional housing include significantly reduced construction times, reduced on-site construction waste and a reduced need for skilled labour. For the homeowner, the increased air tightness and higher insulation of a well constructed SIP built house means that it will annually consume less than half the energy of a traditionally built house. CCMC requires a technical guide before it can evaluate SIPs for compliance with the National Building Code of Canada.

Project No. BRI13050 Cost-Effective Biochar Adsorbents for Naphthenic Acid and Total Organic Carbon Removal in Oil Sands Tailings	Dr. David Mitlin University of Alberta and NINT NRC Edmonton, AB	$ 700,000	$275,000

In this two-year applied research project, Dr. Mitlin's team aim to develop a prototype of inexpensive biochar-based carbon that effectively removes naphthenic acids and total organic carbon from SAGD and oil tailings water. Biochar-based carbon, which is a type of activated carbon, holds promise due its abundance and geographic proximity to the tailings operations. The two key factors that prevent wide-scale utilization of activated carbon is its unacceptably high cost and narrow selectivity of types of contaminants adsorbed. The new biochar-based carbon will be low cost and custom-designed with surface functionality and porosity for high effectiveness in oil tailings water contaminant removal.

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For more information about these projects, visit www.BioLINK.albertainnovates.ca and search for the project number or visit www.bio.albertainnovates.ca/funding/bri2012 for program information.

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