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WISCONSIN INSTITUTE FOR SUSTAINABLE TECHNOLOGY

May 9, 2012

To whom it may concern:

This letter shall serve as affirmation that the Wisconsin Institute for Sustainable Technology (WIST) project on biofuels research meets the criteria for an innovation credit in the University of Wisconsin-Stevens Point sustainability assessment for the STARS program.

WIST biofuels research aims to develop a fermentative unit to produce isoprene, an energy-dense hydrocarbon fuel precursor that can be used to manufacture numerous grades of fuel and serve as a platform chemical for production of polymers and other materials. Isoprene is a valuable feedstock used in the production of latex, rubber, plastics and pharmaceuticals, and it can also be used to produce liquid aviation fuels using inorganic catalyst technologies that currently exist in the petroleum industry. Our goal is to develop an isoprene production unit that will integrate with a lignocellulosic biorefinery we are developing. This unit will use engineered microbes to ferment wood sugars to isoprene and capture the isoprene from the vapor phase above the fermentation vessel.

We have demonstrated these processes at the laboratory scale and are now deploying at the pilot scale. We propose to produce isoprene from pulp and paper mill waste streams commonly referred to as residuals. Cellulosic solids comprise the major component of these residuals. In the mill, residuals are either isolated and concentrated in solid form or biologically treated in a waste treatment facility. Residuals concentrated in solid form are commonly referred to as sludge and typically landfilled at the mill's expense.

Using this sludge to produce isoprene provides pulp and paper producers an opportunity to diversify their product stream and create new jobs while reducing waste. WIST researchers have demonstrated a proof-of-concept isoprene fermentation system by transforming E. coli with multiple genes from the 2-C-methyl-D-erythritol 4-phosphate (MEP) pathway residing on multiple plasmids. These cell lines have produced isoprene from glucose, hydrolyzed cellulose, and hydrolyzed pulp mill sludge.

This innovative research has great potential to generate economic gains as well as environmental improvements.

Best regards,

Dr Paul Fowler
Executive Director

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