

DEVELOPING GREEN AND CLEAN HIGH PERFORMANCE CHEMICALS

Developing an innovative fermentation process for biobutanol production

THE NEED

There is an increasing need to develop environmentally sustainable alternatives to petroleum-based products that are cost effective, high quality and do not impact on food supply. Biobutanol can be produced from a variety of feedstocks and is a building block chemical for the \$115bn global paints, coatings, adhesives and inks markets.[‡] It also has relatively high energy content, making it an attractive biofuel candidate. In terms of greenhouse gas emissions, the carbon dioxide released from burning biobutanol is balanced by the carbon dioxide captured by the growing feedstocks*.

THE PARTNERSHIP

Green Biologics, a UK-based renewable chemicals company focused on biobutanol production, and Borregaard AS, a Norwegian biorefinery company, submitted a successful project proposal to an Innovate UK and Innovation Norway funded competition for industrial biotechnology in 2013.

www.greenbiologics.com;

*US Department of Energy Alternative Fuels Data Center, http://www.afdc.energy.gov/fuels/emerging_biobutanol.html



THE CHALLENGE

This project aims to demonstrate an advanced and innovative fermentation process to produce biobutanol that can compete on price and quality with petrochemical equivalents, as well as having significant environmental and resource benefits.

The process will integrate Borregaard's process technology to convert cellulosic feedstocks to sugar with Green Biologics technology to ferment the sugar to biobutanol. The biobutanol will be validated by Lucite International, a major acrylics producer.

The partners will test the technical feasibility of the process at pilot scale, model to determine the economic feasibility at commercial scale and perform a full product life cycle assessment of primary energy savings and greenhouse gas emissions reductions.



“The UK-Norway funded competitions offer us the opportunity to build new partnerships and gain new technologies”

Freddy Tjosås,
Section Manager
Borregaard



Borregaard

UK-NORWAY: DRIVING THE BIO-BASED ECONOMY



PROJECT OUTCOMES

Whilst this feasibility study is still at an early stage, the partners anticipate that it will result in a product with:

- **Estimated peak market potential: £5-20m**
- **Target markets: Worldwide**

Create:

- **One patent**
- **10 jobs created & 2 safeguarded by UK partner**
- **The scale up and demonstration of integrated processes will result in a new cost saving process that can be marketed internationally under licence.**

“The collaboration gives us access to scale up facilities not available in the UK. The grant has enabled us to develop a partnership that helps us fill the supply chain from feedstock to product to end user (customer). This is useful as the company transitions from a technology provider to a company that owns and operates production (fermentation) plants.”

Edward Green
Chief Scientific Advisor at Green Biologics



UK-NORWAY COLLABORATIONS

The business funding agencies in the UK & Norway signed the Memorandum of Understanding in 2011 to enhance collaboration between the two nations in the area of industrial biotechnology & biorefining. The KTN & IBNN are the delivery team, ensuring opportunities for networking are in place and strategic. This project resulted from such activities.

If you are interested in finding a UK or Norwegian partner, or want to know more about the MoU or opportunities to network, visit the Norway-UK Group on [_connect](#) or email:

 biosciences@ktn-uk.org
 ernst@indbiotech.no

UK-NORWAY: DRIVING THE BIO-BASED ECONOMY