

## Understanding the potential for Biorefining in the UK

Understanding the potential for building a biomass-based economy is a key feature of how the UK process industries can develop a sustainable footprint for the future. Against a backdrop of dwindling oil resources, volatile fuel and raw materials costs and global initiatives to combat climate change, Chemistry Innovation has played a key role in delivering an important study on the economic viability and opportunities for biorefining in the Northeast of England.

The shift from hydrocarbon towards carbohydrate feedstocks is an important sustainability challenge for the chemistry-using industries and a key area of focus for Chemistry Innovation.

In 2007, the Regional Development Agency in the Northeast of England (ONE Northeast), together with its partner organisations - North East Process Industry Cluster (NEPIC) and the Centre for Process Innovation (CPI) - commissioned a study to consider the strategic impact of biorefining as a sustainable source of platform chemicals for the process industries in the region.



Building on its knowledge and expertise in this area, Chemistry Innovation successfully bid for the project in partnership with Bioscience for Business KTN, the National Non Food Crops Centre (NNFCC) and Trends Business Review (TBR).

The study addressed a number of specific questions concerning the economic viability of biorefining to the Northeast based on the existing infrastructure and skills set in the region, as well as the strategic value and long term contribution to the Northeast economy.

The study, which focused on the production of platform chemicals from renewable raw materials as opposed to the more developed area of biorefining technology for fuel production, involved a detailed assessment of:

- the background and requirements for the region
- policy and drivers for biorefining generally
- the different biorefining technologies
- the economics of biorefining in context with the Northeast economy



The six month study, completed in Autumn '07, made six key recommendations based on the short, medium and long term goals for biorefining in the region. The report covered both the physical assets and exploitation of the Northeast's knowledge and skills capital in servicing the needs of the region and, more widely, participation in the global growth in this area.

### What is a Biorefinery

A biorefinery is a large scale facility that converts plant matter (biomass) into a range of usable materials - most often fuels but also chemicals - in the same way as an oil refinery converts oil into fuels and chemicals.

There are two main types of biorefinery processes - **thermochemical** and **fermentation**.

Thermochemical processes use heat to convert biomass into 'BioOil' used for power, or 'Syngas' which can be used for petrochemical manufacture.

1st generation fermentation processes convert the 'valuable' parts of crops i.e. grain, sugar - discarding unwanted parts i.e. straw and chaff - using established technologies in industrial use today.

2nd generation fermentation processes, currently under development, will convert the whole crop - providing much higher levels of productivity as well as being able to process a wider range of biomass.