European infrastructure for conversion of biomass to biofuel

An EU network has helped to overcome fragmentation in research and development facilities for thermochemical technologies by granting researchers access to high-level experimental facilities and services across Europe.

Converting waste from recently living organisms such as plants and trees (biomass) into biofuels can help to reduce greenhouse gas (GHG) emissions. In leading industrial European countries, there are already high-level experimental facilities which researchers have used to address challenges associated with biofuel production and biorefinery establishment.

A consortium of 26 partners launched the EU-funded project BRISK (The European research infrastructure for thermochemical biomass conversion), which has facilitated cooperative research into thermochemical biomass conversion in their
The BRISK initiative fostered a culture of cooperation in the European scientific community by combining network, joint research and transnational access activities. Protocols and databases to facilitate data sharing and benchmarking of experimental rigs were also created. In addition, project partners focused on the development of advanced measurement methods and procedures in thermochemical biomass conversion.

These approaches included difficult-to-measure constituents such as particulates, tars and sulphur. Thermal gasification technology and upgrading technologies were also refined to improve flexibility of the gasifier installation.

Researchers enhanced methods for advanced testing and optimisation of catalytic processes of biosynthetic gas conversion to provide second-generation liquid or gaseous biofuels. Particular attention was given to synthetic fuels produced from the Fischer-Tropsch process, synthetic natural gas, dimethyl ether and methanol.

Project partners used a wide range of European biomass feedstocks, such as wood, energy crops, agricultural waste and other non-food biogenic materials for thermal conversion of biomass. The materials involved in catalysis were zeolites, cobalt compounds, chromium and aluminium oxides, as well as olivine. Lastly, they investigated the impact of contaminants such as tars in solid oxide fuel cells, and zinc and lead in ash.

By uniting the infrastructures available at different laboratories BRISK was able to cover the entire value chain. This meant that research was performed from the preparation of the biomass feedstock, to conversion, then treatment and finally through to utilisation.

Enhancing biomass utilisation without risking sustainability is a European energy priority, which can be linked to targets for curbing most GHG emissions by 2050. Enhanced energy security of supply and integration with other industrial sectors such as agriculture also play a role. Other key elements in achieving this goal are the improved use of biofuels and products in advanced biomass conversion units and biorefineries.

**Keywords**

Thermochemical, biomass, BRISK, biofuel, biorefinery
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