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Biofuels Research Infrastructure for Sharing Knowledge

Communities striving to reduce their reliance on fossil fuels cannot fail to be intrigued by the prospect of growing their own energy or producing it from waste. A closer look, however, reveals that this proposition is not as straightforward as it seems, both in terms of its implications and of its technical implementation. The development of second-generation biofuels, produced and processed with a specific emphasis on sustainability, extends the scope to power Europe's future partially from biomass. A complex challenge, which BRISK is helping to address.

An energetic approach

BRISK focuses on thermochemical conversion, one of two avenues for the production of bio-fuels. It draws on the leading expertise of 26 biofuels research centres in 14 countries, combined into a broad knowledge base that enables the initiative to mobilise the full range of skills and resources needed to take this promising field of research and development another step ahead.

Together, the partners are fostering a culture of cooperation within the project, throughout the wider scientific community and with other initiatives in the field. This interaction feeds into the development of protocols, databases and benchmarking, which will facilitate data exchange and enhance the operation of the various participating research facilities. It also shapes the project's transnational access programme, a scheme which encourages scientists to apply for funded opportunities to use BRISK installations.

The project addresses the entire thermochemical conversion process, from the preparation and conversion of feedstock to the treatment and eventual use of the biofuel. This multifaceted process can involve an array of materials, all of which present specific challenges. The specifics of producing energy from municipal solid waste or sewage sludge, for example, differ from those associated with black liquor, and again from those involved in the use of woody biomass or crop residues. The wide variety of the liquid and gaseous biofuels produced adds yet another layer of complexity.

Refining Europe's biofuels

The BRISK infrastructure reflects the entire spectrum of research into thermochemical biomass conversion, fostering synergies to take the entire sector forward rapidly and coherently — an outcome that disparate, fragmented approaches would be unlikely to achieve. It encompasses a total of 49 installations, which include high-quality thermochemical conversion rigs (e.g. combustors, Fischer-Tropsch synthesisers, furnaces, gasifiers, methanators, pyrolyzers and upstream/downstream units), pilot-scale facilities for studies on individual components or the operation of entire plants, and powerful analytical equipment notably designed for fuel and ash characterisation or for *in situ* and dynamic measurement of fundamental physics and process parameters. A broad range of operating conditions is supported.

BRISK intends to provide access opportunities for more than 230 external projects, and as a further boost to the future of biomass, the partners are collaborating on several joint research activities of relevance to the wider scientific community. One line of activity will be dedicated to methodologies for the characterisation of new feedstocks, second-generation biofuels and residues. Another will focus on advanced measurement methods and operational procedures, and a third will enhance methods for advanced testing, examination and optimisation of the catalytic conversion processes involved in transforming biosyngas into second-generation biofuels.



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The outcomes of the work supported by BRISK will be freely available and will notably be transmitted through the participating universities to support the training of a new generation of scientists and engineers. Other dissemination activities will be directed at industry, and more specifically at

small and medium-sized enterprises (SMEs). This accumulated knowledge will be one of the project's enduring legacies, which will also include a public database of infrastructure owners and rigs — as well as a business plan for lasting successor activity.



Project acronym: BRISK

Funding scheme (FP7): Integrating Activities (IA)

EU financial contribution: €8.98 million

EU project officer: Mariano Menna

Duration: 48 months

Start date: 1 October 2011

Completion date: 30 September 2015

Partners:

Kungliga Tekniska Högskolan (SE)

Åbo Akademi (FI)

Aston University (GB)

Bioenergy 2020+ (AT)

Cardiff University (GB)

Centre for Research and Technology Hellas (GR)

Danmarks Tekniske Universitet (DK)

Technische Universität Delft (NL)

Energitekniskt Centrum i Piteå (SE)

Stichting Energieonderzoek Centrum Nederland (NL)

Fundación Ciudad de la Energía (ES)

Inero Ingeniería, Tecnología y Consultoría (ES)

Fondazione Internazionale per la Ricerca sulla Combustione (IT)

Joint Research Centre (EC)

Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile (IT)

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