

Newsletter 1-2012

This issue focuses on the project workshop arranged in Trondheim recently as well as IEA activities and the GasBio PhD study.

GasBio project workshop

The third GasBio project meeting and workshop was arranged 14 – 15 March in Trondheim. During the project meeting the most recent project results was presented and discussed. Three invited speakers, from Energos, Statoil and Abengoa, gave interesting presentations during the workshop the second day.

Petter Lundström presented Energos and their gasification technology. The Energos plant was designed to deliver a small scale (5000-10 000 kg/h) Energy from Waste plant which could provide;

- Communities with a cost effective alternative to mass burn incineration
- Minimum emissions to atmosphere
- High flexibility in handling different waste types and caloric values

The result was a two stage thermal process, gasification + gas combustion, which enabled extremely good combustion control, eliminating the need for sophisticated and expensive flue gas treatment. This concept based on gasification is especially favorable in the UK where the ENER-GOS technology is classified as an Advanced Conversion Technology (ACT) and the electricity produced from the biomass fraction of the waste qualifies for Renewable Obligation Certificates (ROCs). UK does also represent the best marked opportunities together with Italy and some projects in Norway. By now Energos has delivered 8 plants in Norway, Germany and UK. Energos is since 2004 a part of the ENER-G Group. They have 750 employees of which 40 are in Energos.

Knut Grande's presentation "Upgrading of FT waxes to lubes and transportation fuels" addressed several challenges connected to the FT synthesis and downstream processes. Some of the topics that were presented and discussed were the following; optimization of FT catalysts with respect to specified product quality and composition, the non-relevance of the feedstock origin for the FT process, how the physical properties of GtL (and BtL) differ from the fossil based fuels and also their effect on engine performance, as well as processing of FT-wax to the preferred product distribution of naphta, diesel and base oil. The presentation was partly based on experiments carried out at the hydrocracking plant at Statoil's research centre at Rotvoll.

Abengoa is an international company with 24 000 employees around the world. Yolanda Peña Gómez presented the bioenergy strategies at Abengoa Bioenergy, based in the south of Spain, and gave some glimpses of their comprehensive and impressive activities within the bioenergy field. Abengoa has developed to be one of the world's leading companies for producing first-generation biofuels while also developing the next generation. In 2001-2003 Abengoa identified lignocellulosic ethanol as strategic to cover future demand and enzymatic hydrolysis was selected as the most promising one. Abengoa Bioenergy have pilot plants and demonstration plants in USA, Brazil and Europe, and the first commercial scale 2nd generation ethanol plant will be in operation during 2012-2013. Even if their major focus is the biochemical route, Abengoa has also interest in the thermochemical route. Interesting presentations, strong involvement and fruitful discussions made this a successful arrangement.

GasBio PhD study

Numerical modeling of biomass conversion in a gasification reactor is the topic for a PhD study in the GasBio project. After the comprehensive studies of the open source code MFIX, we are now exploring more CFD platforms including commercial software ANSYS Fluent and open source code OpenFOAM. ANSYS Fluent software contains the broad physical modeling capabilities needed to model flow, turbulence, heat transfer, and reactions for industrial applications. Meanwhile, OpenFOAM, as the most popular open source CFD toolbox, offers complete freedom to customize and extend its existing functionality. The idea to use various platforms is for the purpose of providing more validation possibilities, especially for eliminating numerical errors. The gasification model will be built using ANSYS Fluent and OpenFOAM, while the MFIX, the only code of these three that has the real particle soft collision model coupled with the flow solver, is mainly used to examine the differences between collision and non-collision situations.



GasBio

IEA activities

IEA task 39 – Commercializing Liquid Biofuels

IEA Task 39 is a global network of international experts dedicated to sustainable development and deployment of transportation biofuels as part of IEA Bioenergy. There is at least one Business Meeting a year where the different experts update each other with the current biofuels status in their respective countries through country progress reports and discuss key areas for further biofuels development. SINTEF, PFI and Borregård represent Norway in the strategic network.

The last IEA Task 39 meeting was held 27 February in Copenhagen. A total of 15 countries participated in the meeting, resulting in abundant fruitful discussions. Norway, in particular, described the challenges associated to the current biofuels policy framework and stressed the importance of this logical structure for the further implementation of biofuels in the country in question.

Besides the country progress reports, the meeting was devoted to discussing a number of activities that the Task has begun to undertake on a regular basis such as the establishment of a demonstration plant database, writing of several technical reports and collaborations between the countries of Task 39 and between Tasks within IEA Bioenergy. The upcoming 2012 meetings will be held in New Orleans (USA), Vancouver (Canada) and Vienna (Austria). (www.task39.org)

IEA task 33 Thermal Gasification of Biomass

The last IEA task 33 meeting was arranged in Piteå, Sweden, 18 – 20 October 2011. The first day of the meeting was devoted to 11 country updates by the participating member representatives. The status of biomass gasification (for both fuel and power purposes) in each country was discussed, industry and research in the member countries were presented. Some interesting and desired tasks to be carried out during the next triennium were discussed.

The Task33 webpage (www.ieatask33.org) contains a gasification database, which was presented shortly. Now, a total of 87 biomass gasification facilities are registered in the database, of which 68 facilities are in member countries. The gasifiers can be divided by three parameters: technology (co-firing, CHP, synthesis, other innovative), type (pilot, demo, commercial) and status (planned, announced, under construction, under commissioning, operational, on hold). Most of the gasification facilities are used for CHP (44%) and synthesis (39%) purposes, while only 4% for co-firing. Other innovative technologies are covered with 13% of all gasifiers. There are 48% commercial gasifiers, 27% pilot plants and 25% demonstration plants for gasification facilities in the database. 59% of the gasifiers are in operation.

The second day, the country representatives participated at the expert workshop on "Biomass Gasification Opportunities in the Forest Industry", and the third day the following sites were visited: ETC Laboratories, BLG Pilot plant, EF Gasifier, VIPP Pilot plant, DME Pilot plant, MEVA Gasifier + ICE CHP plant, Smurfit Kappa wood intake and wood yard, SunPine tall oil biodiesel plant.

Other news

Aviation biofuels

The work on aviation biofuels from 2011 will be converted to a conference paper. It will be presented at the PRES 2012 conference: 15th Conference Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction. in Prague in August 2012.

Torrefaction of biomass workshop in Leeds

The workshop on torrefaction takes place 28 March 2012 at the University of Leeds. This workshop forms a part of the initial dissemination activities of the project: "Premium Upgraded Biomass Solid Fuels- Fundamentals of torrefaction and performance of torrefied fuels", which is financed by the Energy Programme, Grant EP/H048839/1. SINTEF will be giving a presentation detailing some of the results that have been obtained through the STOP project. Information on GasBio will also be given due to the existing link between the two projects. The workshop will include many interesting talks from different European companies and research institutes. Among these are: Rotawave, ECN, and SSE Ferrybridge Power Station.

3rd International Conference on Biomass and Waste Combustion

is arranged 24 - 25 April 2012 in London, UK. The Conference will focus mainly on the technical aspects of biomass and waste combustion. The Conference is arranged by SINTEF, KEMA and Vattenfall. (www.sintef.no/NGBWconf_2012)

Technoport Renewable Energy Research Conference 2012

This scientific conference is arranged 16 - 17 April 2012, in Trondheim. In addition to interesting lectures on general issues concerning renewable energy, there will be 13 detailed scientific parallel sessions. One session is devoted to bioenergy including heat, cooling and/or power generation from biomass, another is devoted to biofuels and biorefinery. The conference is arranged by SFFE - Centre for renewable energy. (<http://2012.technoport.no>)

Aebiom European Bioenergy Conference 2012

This conference is arranged by the European Biomass Association in Brussels 25-27 June 2012. The focus of this years event will be : EU legislation, sustainable feedstock supply and market opportunities. (www.aebiom.org)

GasBio is a Knowledge-building Project with User Involvement (KMB) co-funded by the Norwegian Research Council in the RENERGI-programme. The budget is 25 MNOK, and the duration is 4 years (2010-2014).

For general inquiries regarding the GasBio project, please contact: Judit Sandquist, judit.sandquist@sintef.no
SINTEF Energi AS, 7465 Trondheim, Phone: + 47 73 59 72 00, www.sintef.no/energi

