

STOP

STable OPerating conditions for biomass combustion plants

www.sintef.no/stop

This is the first newsletter of the STOP project. This issue focuses on the start-up of the project as well as IEA activities. The newsletter aims at providing glimpses of recent research activities at SINTEF and NTNU within the bioenergy area.

Kick-off meeting in the STOP project

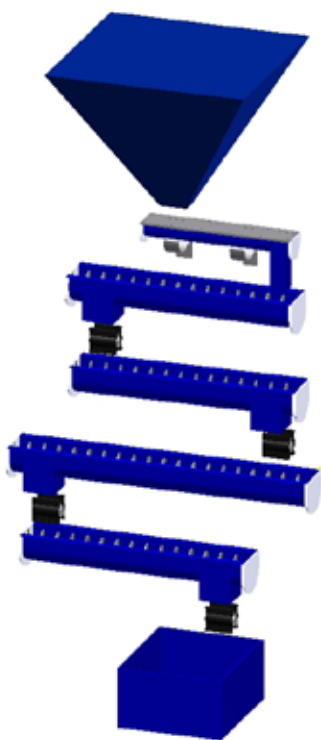
STOP is a competence building project (KMB) supported by the research council of Norway. The main aim of the project is to improve stable combustion conditions for biomass and biomass residues combustion plants. Furthermore, the project concentrates on fulfilling its main goal through fuel-upgrading.

The main focus of fuel upgrading will be torrefaction which is known to improve many of the fuel characteristics of biomass. Briefly explained, torrefaction is a mild-pyrolysis (200-300°C) process that can be employed as a pre-treatment step to improve fuel properties of biomass materials.

The treatment can result in not only increased energy density, but also enhanced grindability, better homogeneity and better storage and transport characteristics for biomass fuels.

The total budget for the project is 3.5 million NOK pr. year for a period of four years. In addition, SINTEF is investing 2 million NOK for the design and building of an experimental rig that will allow detailed studies of the torrefaction process.

A kick-off meeting for the STOP project was held 24 November 2010.



Torrefaction reactor

The participants were NTNU and SINTEF personnel that are involved in the project in addition to participants from the industry partners.

An overview of the projects progress was given in the beginning of the meeting, showing the distribution of the budget for the different sub-projects and the goals achieved so far. In this regard, it is worth mentioning that most of the efforts this year have been concentrated on the design of a flexible torrefaction reactor that will be ready for use in the middle of next year. The torrefaction reactor is estimated to cost 2 millions NOK (fully instrumented) and is entirely financed by SINTEF Energi.

In an effort to better understand how to achieve stable operating conditions in combustion plants through torrefaction, literature studies on four topics have been conducted and the results of these were presented in four different presentations:

- Torrefaction –State-of-the-art
- Fuel related operational problems in biomass and biomass residues combustion plants
- Fuel mixing options
- Fuel flexibility and combustion process boundary conditions in biomass combustion

The time after lunch was used for a plenary discussion where two topics were discussed in order to define in more details the future of the project. The discussed topics were:

- Technical and economical challenges in biomass and biomass residues combustion plants - What can torrefaction contribute with?
- Research tasks in the STOP project for 2011-2013

In the first plenary discussion, torrefaction was regarded as a method for improving fuel quality and an interest was shown on testing the technology on some waste streams. It was also agreed that torrefaction could help improving syngas quality in gasification processes. Ideas that were found interesting as research topics were:

- Mild torrefaction of waste components
- Influence on acid components
- Pelletizing, pellet quality
- Heat conductivity of torrefied fuels (pelletization)
- Optimization of the torrefaction process for an optimum pelletization process
- Separate between combustion and gasification applications for torrefied fuels

IEA task 32 activities

IEA Task 32 "Biomass combustion and cofiring" arranged their second meeting this year in Copenhagen 7-8 October. In conjunction with the meeting, IEA Bioenergy Task 32 and 33 jointly organised a workshop on new developments in small scale power production from solid biomass.

The presentations gave an overview on different CHP technologies for biomass, including ORC (Organic Rankine Cycle) technology, Stirling engines, gas engines combined with different gasification technologies, steam engines and steam turbines. Some of these technologies are already offered commercially, others are still in the development stage. Further information and presentations are available at www.ieabcc.nl.

An upcoming event relevant to the STOP project is the workshop: "Development of torrefaction technologies and impacts on global bioenergy use and international bioenergy trade". This event takes place in Graz, Austria, 28 January 2011, as a side-event of the Central European Biomass Conference (CEBC).

This workshop will give a comprehensive overview of fundamentals of torrefaction, the main advantages of and the challenges in producing torrefied biomass. Ongoing R&D activities will be shown, demonstration plants under construction or already in operation will be presented and the latest state-of-science in torrefaction will be discussed. Also, the possible implications of commercially available torrefaction technology for international bioenergy trade will be highlighted. Further information is available on www.ieabcc.nl.

Other news

Bioenergidagene

The largest Norwegian bioenergy conference, "Bioenergidagene 2010", was arranged at Gardermoen 8 -9 November 2010 by Nobio.

Three presentations were given by employees at SINTEF Energi on the topics; "CHP – new technology and small scale solutions" presented by Øyvind Skreiberg, "Wood log combustion for heating of buildings with low heating demand – how to develop low load wood stoves with high efficiency, long heating time and low emissions" by Edvard Karlsvik and "Cooperation between research and industry in Norway towards biofuels production via biomass gasification" by Judit Sandquist.

Programme and presentations are available on the Conference website www.nobio.no.

Norwegian Business Delegation

On the occasion of the State Visit of Their Majesties King Harald V and Queen Sonja to the Slovak republic 26 - 28 October 2010 Mette Bugge, SINTEF Energi, was invited as a member of the Norwegian Business Delegation. Several industrial seminars were arranged with invited speakers from the Slovak republic and Norway. Mette Bugge presented "Bioenergy research in Norway" in the "Renewable Energy and Environment Seminar".

New employee at SINTEF Energi

Berta Matas Güell has recently joined SINTEF Energi as research scientist in the Bioenergy group. Berta studied chemistry at the Universitat Autònoma and afterwards she moved to The Netherlands and carried out her PhD at the Catalytic, Processes and Materials group at the University of Twente in the field of bioenergy/catalysis. She was particularly involved in the production of hydrogen via catalytic steam reforming of biomass-based feedstocks. She defended successfully her PhD thesis in October last year.

STOP website

The STOP project website is established, and it will be continuously updated with information about activities and results. Unrestricted publications will be available for download or ordering. (www.sintef.no/STOP)

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