
International Energy Agency
Bioenergy Agreement
Task 19
Biomass Combustion

Working Group Meeting, Biomass Combustion

Arranged by:
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TNO-MEP, The Netherlands

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Minutes of the Meeting,
Working Group Meeting-Biomass Combustion

Wednesday, October 21-1998, Scandic Hotel Regina,
Herning, Denmark

IEA Working Group Meeting Task 19
Biomass Combustion
21-10-98, Herning, Denmark

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Date : Wednesday, October 21, 1998

Time: 9:00 -17:00 h

Place: Scandic Hotel Regina, Herning, Denmark

Time	Topic
9:00	Opening by Sjaak van Loo <ul style="list-style-type: none">• <i>Minutes of meeting-Würzburg, June 9, 1998</i>• <i>Introduction new members</i>
9.15	Ash related problems during combustion <i>Co-ordinator Don Hardesty (USA), presented by Helle Junker</i>
09:30	Characterisation and utilisation of biomass ashes <i>Co-ordinator: Ingwald Obernberger (AU)</i> <ul style="list-style-type: none">• Presentation of results of the "International Biomass Ash Workshop"
10:00	Classification of Biofuels <i>Co-ordinator: Sjaak van Loo (NL)</i> <ul style="list-style-type: none">• New Task proposal in IEA (enclosed)• Best Practice List NL (distributed in meeting)• Classification in NL
10:30	Coffee Break
11:00	Modelling <i>Co-ordinator: Sjaak van Loo (NL)</i> <ul style="list-style-type: none">• presentation of questionnaire (enclosed)
11.15	State of the art combustion <i>Co-ordinator: Sjaak van Loo (NL)</i> <ul style="list-style-type: none">• First draft of report will be presented (enclosed)
11.30	Discussion: <ul style="list-style-type: none">• Progress• Next meetings (list of events enclosed)<ul style="list-style-type: none">– Task 19 meeting point at Sustain'99, May 1999, Amsterdam (NL)– Task 19 seminars (subjects: co-combustion; CHP etc.)
13.00	Lunch (continuation of discussions)
14:00	Excursion to biomass fired plants and gasifier (district heating plants)
17.00	End of meeting (Dinner at 19.30)

Attendance list IEA-meeting, 21 October 1998, Denmark

Representatives

EC	Michaël Papadoyannakis
Austria	Ingwald Obernberger
Denmark	Henrik Houmann Jakobsen
The Netherlands	Sjaak van Loo
Norway	Øyvind Skreiberg
Sweden	Claes Tullin
Finland	Heikki Oravainen
UK	William Livingston
USA	Helle Junker

Observers:

The Netherlands	Frans Sulilatu
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New Task members

For the running triennium Øyvind Skreiberg will represent Norway instead of Johan Hustad

Brazil will participate in Task 19.

Austria, India, Poland, Italy and the Czech Republic intend to participate in Task 19

Summary of the meeting

Sjaak van Loo opened by welcoming all participants and observers to the second meeting in the new triennium. Eight of fourteen countries were represented. The agenda for the meeting was represented and the meeting started with the introduction of the representatives of the UK (Mr. Livingstone) and Norway (Mr. Skreiberg). Mr Skreiberg is from SINTEF and replaces Johan Hustad. Mr. Livingstone works for Mitsui Babcock Energy Limited. The sheets of the UK are summarised in this report.

Next, the minutes of the first IEA-meeting in Würzburg were discussed. A general comment was that in order to be able to distribute IEA-reports in an easy way in the member countries, the reports should be drawn both in bound and unbound edition.

Project Status

Ash related problems during combustion (USA)

Hella Junker presents the work programme to be executed by the USA for the ongoing triennium. The presented sheets are summarised in this report.

Ash handling during disposal (Austria)

Before discussing the actual project, the results of the workshop "Ashes and Particulate Emissions from Biomass Combustion" were presented by Obernberger.

Ingwald Obernberger has prepared and distributed the proceedings of this workshop to all IEA-members. Among others, the report contains guidelines for ash utilisation. Another conclusion is that Cd and Zn seems to be very relevant in ash material. With special technologies, Cd fractionation can be achieved in grate fired plants.

Referring to a question from Michail Papadoyannakis, Obernberger explained that ashes from both gasification and combustion processes are analysed since the ashes of gasification processes contain much higher amounts of unburned carbon (~75%).

Classification of biofuels (The Netherlands)

Sjaak van Loo will structure the activity in more detailed items and distribute them amongst the member countries. Following, the IEA-member countries may contribute to the activity according to the topics. The proposal will be send for comments. Sjaak van Loo emphasised that co-operation is needed in order to accomplish the objective of the project.

According to Michail Papadoyannakis, an EC project is under preparation focused on classification. It is not clear whether the project deals both with biomass fuels and ash. Among others, the project includes collecting all kinds of data on biomass. Michail will check the real objective of the project.

Further, the working group agreed to start an IEA-round robin test focus on ash analysis. Items that could be analysed are moisture content, ash composition, particle size. Ingwald Obernberger will take care of the ash sample preparation and distribution to the IEA-member

countries. It is suggested to consult the Best Practice List which has been distributed during the meeting.

Modelling (the Netherlands)

A questionnaire will be sent to the IEA-member countries in order to get a good overview of the activities. Norway suggested to have a seminar concerning modelling possibly together with the Nordic countries.

State of the art combustion, coordinated by Netherlands.

A draft report has been prepared by the Netherlands and sent to the IEA-member countries. It is emphasised that the report is a start and additional inputs are welcomed. The EC suggested to take the report as a structured input for countries and agreed that an inventory of ongoing projects should be included in the report.

Norway proposed to contribute with information concerning wood stoves. DK will send information about CHP. A contribution from Switzerland is expected with respect to emissions.

Future activities

Appointments

- Austria stressed that a one day IEA-meeting is not sufficient to discuss all relevant topics. For the coming years it was proposed to have two days meetings, twice a year. The working group agreed with this suggestion.
- EC would also like some information from the countries who are not able to attend the meeting (a start is made with presenting the activities of New Zealand in the enclosure of this report).
- The next IEA-meeting of Task 19 in 1999 will be in Amsterdam together with the World Sustainable Energy Trade Fair (25-27 May 1999). In order to contact the industry, active participation on the trade fair is pursued. Exhibition space for the IEA Bioenergy Agreement will be hired.
- With respect to industry it is appointed that all member countries will prepare a list with industry involvement biomass projects. This also corresponds to the wish of DK to put country projects on the agenda for the next meetings of Task 19.
- Future IEA-reports will be distributed in both bounded and unbounded form.

Miscellaneous

- The USA (Don Hardesty) put in a bid for hosting one of the IEA meetings in 1999 at Sandia, California. Larry Baxter suggested to combine it with the conference "Fourth Biomass Conference of the Americas" August 29-September 2, 1999 in Oakland California, USA. This was agreed on.
- Concerning modelling, Norway suggested to participate in the Nordic Seminars.
- The meeting in Innsbruck (May 2000) is still open. New Zealand would be happy to host Task 19 in Rotorua, New Zealand before the end of the triennium 1998-2000.

Excursions

Two excursions were organised by Henrik Houmann Jakkobsen from DK. A visit has been paid to a gasifier and to a chip/grain fired district heating plant.

Chip/Grain Fired community heating plant in Herning

The size of the plant is 0.5 MWth and produces hot water meant for heating 25 houses. Each house is connected individually to the heating net. The installations use an understoker boiler and can be operated with either grain or wood chips. The installation is in operation since 1995 without noticeable problems. A bag filter is used for reduction of particle emissions. The emissions of the installation are summarised in the table below.

Emissions of the combustion installation

Emissions (10% O ₂)	Units	Chips	Grain
Particulates	[mg/nm ³]	50	179
CO	[ppm]	-	14
NO	[ppm]	-	249
SO ₂	[ppm]	-	49
SO ₂	[ppm]	-	85
Efficiency	[%]	90	88.4

Hollensen Gasifier

A visit was paid to the downstream gasifier from Hollensen (Ingenor-OG Kedelfirma APS).

The gasifier is integrated in a district heating net and supplies heat and electricity to 74 homes. The electricity production is 100 - 150 kWe; the heat production 300 kWth; efficiency about 80%.

The gas inlet temperature before the cleaning system is 600°C; the outlet temperature is 45 °C with a tar content of 2000 mg/nm³. This gas is fed to a Mercedes motor.

The NO_x emission is 300 mg/nm³; the CO 800 ppm. The oxygen content is 1%.

The engine has been running for 2.230 hours with an electricity production of 150 kWe. Main problems observed are the high coal content in the ash and the condensate of the washing tower. The gasifier system and design should be considered as very promising. As far as known this is the first operational gasifier in Denmark.

A description of the gasifier is enclosed in this report.

Ash related problems during combustion
Co-ordinator Don Hardesty (USA), presented by Helle Junker

Characterisation and utilisation of biomass ashes
Co-ordinator: Ingwald Obernberger (AU)

Modelling

Co-ordinator: Sjaak van Loo (NL)

Classification of Biofuels
Co-ordinator: Sjaak van Loo (NL)

Field trip:
Chip/Grain Fired community heating plant in Herning

Field trip:
Hollensen Gasifier

Country report:
New Zealand

Country report:
Sweden

Country report:
UK

Country report:
USA

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