



Biomass Industry Day

Thursday, 20th October 2005 • Palais des Congrès, Paris, France
On the occasion of the 14th European Biomass Conference and Exhibition



1) Development perspectives and technical barriers: From RD&D to Industrial application in the 25 EU Countries:

C. Nielsen, Elsam

Intelligent Integration of Renewables into a Fossil based Energy System

Intelligent in the context of “Intelligent Integration of Renewables in a Fossil Based Energy System” means “Small steps ahead” for the development of the RE-sector. The combined effects of economy, technology and especially legislation are the instruments to make it possible.

Regarding on-going successful straw conversion projects: it is important to make projects economically attractive for the farmers. It is preferable for a farmer to produce food, animal feed and energy, rather than only energy. It is also important to think in terms of “energy” and not only of “electricity”. Nielsen stressed the importance of including the transport sector, i.e. “transportable energies”, in successful RE strategies.

G. Grassi, EUBIA

Low cost production of Bioethanol from Sweet Sorghum

Mr. Grassi explained the characteristics of Sweet Sorghum as one of the most interesting energy crops. Considering the technologies available today the Sweet Sorghum ethanol production cost is near to 250 €/ton. So it is almost competitive compared to sugar cane ethanol production (220 €/ton Brazil). By using Sweet Sorghum also the possibility to exploit the rest of the crop (pannicle and bagasse) for food, animal feed, pellets and heat or electricity production is given. Considering this wide variety of products that could be obtained by Sweet Sorghum integrated complexes could be developed and set up optimizing the production of what needed.

H. Dichtl and R. Schaer, Siemens Power Generation

Power Plants for Solid Biomass

R. Schaer presented several of the power plants of Siemens Power Generation. Siemens uses modular plant designs with standardised components. This allows for the rapid creation of reliable plant designs.

Scale is an important factor in determining the economies of power plants; plants of 20MW and above are generally preferable.

M. Deutmeyer, CHOREN Industries GmbH

BtL Production on an Industrial Scale - The CHOREN Beta Plant at Freiberg - A short Description of the Technical Outline and Feedstock Strategies

CHOREN stands for Carbon, Hydrogen, Oxygen, Renewable Energy. CHOREN has a totally new way of producing second generation biofuels, BTL (Biomass-to-Liquid) called SunDiesel. This Fischer-Tropsch-Diesel, technically comparable to fossil diesel, has lower emissions and it is the only biofuel that gets full points on all the aspects of CO₂-reduction, cleanliness, availability, energy density, infrastructure and process design. This product has also the support of the automobile industry, that can use this fuel in existing engine designs. The CHOREN process is efficient, fuel-flexible and environmentally friendly. A 25 MW “Beta” diesel production plant is foreseen to be running by the beginning of 2007 in Freiberg.

GENERAL CONCLUSIONS PART 1

- We need to create integrated energy systems that can run on different feedstocks (such as energy crops, straw, biomass residues and waste) and generate different products (such as fuels, heat, electricity and chemicals).
- Scale is the key determinant of biomass power plant economics. Standardised components, combined in modular, large-scale plants, offer the lowest cost option for power plants.
- Dedicated energy crops can greatly improve the economics of biofuels production. In particular, optimised energy crops are necessary to allow competitive biofuel production in European climates.
- Biomass technologies should be designed to minimise investment requirements for additional infrastructure.



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2) Biomass Market and Industrial/Commercial Utilisation: state-of-the-art, non technical barriers to be overcome and most promising applications in the 25 EU countries:

J. Lackmann, Bundesverband Erneuerbare Energie

The Development of the Biomass Industry in Germany - The Perspective from the German Renewable Energies Federation (BEE)

Biomass is the most important of all Renewable Energies in Germany. Germany actually started from a very low level, but has seen a very rapid recent growth in wind and biomass, which has caught the attention of the global community. Currently, there are 2100 bioenergy plants in Germany, with a total capacity of 430 MW.

S. Kilburg, C.A.R.M.E.N. e.V.

Energy from Solid Biomass - Economics, State of the Art and Experiences

S. Kilburg analysed the economics of different solid biomass feedstocks. Considering the actual high fossil fuel prices, solid biomass, in particular that based on wood, proved to be a very successful heating fuel in Europe. At current prices, wood chips clearly offer the cheapest heating solution, followed by wood pellets and then fuel oil.

D. Leboutte, CMI Energy Services

Power Station Electrabel "Awirs" - From Coal to Wood Pellets

D. Leboutte described a case study in which a coal boiler was converted to run on wood pellets. All modifications were made only to minor devices not to the boiler and the plant could be converted back to operate with coal with only minor modifications. This methodology, developed for this particular case study, could also be applied to boilers of different sizes.

J. Blondy, TOTAL

Biofuels in Europe for the Next Coming Years

A growing demand for diesel in Europe and a higher requirement for quality makes for a favourable environment for alternative fuels.

Among them biofuels are and will remain for a while a valid answer to the transport sector stakes. If present biofuels, FAME in diesel and ETBE in gasoline, are limited in blending with conventional fuels, a second generation of biofuels, such as NExBTL, will soon allow a much higher biofuel content.

GENERAL CONCLUSIONS PART 2

- Solid biomass fuels offer an economically attractive alternative to fossil fuels in heating applications.
- Germany, Austria, Sweden and other European countries have enjoyed a recent boom in wood-based heating systems, and have reached technological maturity.
- Coal boilers can be modified to run with wood pellets with little or no changes to the boiler itself.
- Second generation biofuels have important perspectives.



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3) Best practises and field of experiences in the 25 EU Countries - Biomass for electricity production, heating /cooling and transport:

P. Berger, MTU-CFC

MTU CFC Solutions - The Fuel Cell *hotmodule*[®]

Mr. Berger explained the technology available today for trigeneration (heat, electricity, cooling) by using the so-called "Hotmodule" Molten Carbonite Fuel Cell. Power plants based on this technology, characterised by high efficiency and no emissions, are suitable for a decentralised energy production. The "Hotmodule" fuel cell, usually fuelled by methane, could also work with biogas even if this requires prior cleaning.

M. Ljung, Stockholm Public Transport Towards Sustainable Travel

Ms. Ljung described the Stockholm Public Transport experience using ethanol fuelled buses. It has been demonstrated that ethanol is the most economically viable way to handle both global and local emissions and to meet EU standards with today's technology. Within a short and medium term perspective bio-ethanol is the only renewable fuel with a high production potential. The infrastructure is cheap and easy to handle since we are used to liquid fuels.

U. Wästljung, Scania

Biofuels for Road Transport: Twenty Years of Experience of Ethanol fuelled Buses

Environmental care and high oil prices will lead the way to increase the use of biofuels and increase fuel efficiency in the road transport sector. From the Scania point of view liquid fuels are the most efficient and convenient to use; blends of alternative fuels (such as bio-fuels) in conventional diesel are an effective method for their introduction. Engine fuelled with mixed diesel or ethanol is a proven and reliable technology, especially for heavy transport, that really improves the environment and is commercially viable.

P. Beuzit, Renault-Mission Energies

Biofuels as a Step to an Oil Free Automobile

In the long term hydrogen and fuel-cell technology would be the best solution for an oil free vehicle. In the short term, biofuels seem to be the ideal opportunity among the possible solutions to gradually abandon fossil fuels. They would be available in large quantity from energy crops, they save between 50% to 85% of CO₂ and are suitable for fuel-cell technology. It is also possible to develop an engine optimised on what we want (i.e. no CO₂ emission) and then adapt bio-synthetic fuels to the engine.

J. Haushalter, Wärtsilä Power

Wärtsilä's Electricity Production or Cogeneration from Biomass in BioPower Plants, and from Vegetable Liquid Biofuels in Diesel Power Plants.

Mr. Haushalter presented the company, its business and the different types of biomass power plants developed. Wärtsilä offers specific biomass combustion technology, so called "biograte technology" using a rotating grate and feeding the fuel to the center of the grate. From an environmental point of view, using wood and liquid biofuels offers great advantages especially in CO₂ saving. The world largest power plant running on liquid biofuel (palm oil from Malaysia) in the world, built by Wärtsilä, is operated in Monopoli, Italy.

GENERAL CONCLUSIONS PART 3

- Biofuels seem to be one of the most interesting and already viable opportunities for power production.
- According to several studies and experiences, among biofuels ethanol is the best solution for the transport sector in the short term.
- In future biogas and biofuels could be used for Hydrogen production and in fuel-cells.



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V. Hecl, Intelligent Energy Executive Agency (IEEA)

Intelligent Energy Europe Program (IEE)

IEE program specific objectives are: promote efficient and intelligent patterns of energy production and consumption, create the means and mechanisms to boost energy efficiency, renewables and energy diversification and develop instruments to monitor and evaluate policy measures. The IEE Agency, with independent experts evaluates the proposals. After a successful negotiation, a grant agreement is signed with the Commission (EU contribution covers up to 50% of the total cost) then IEEA monitors the progress of the project. The four main IEE fields of interest are: energy efficiency and rational use of energy (SAVE), promotion of new and renewable energy sources for electricity, heat, and biofuels (ALTENER), fuel diversification, biofuels utilisation and energy efficiency in transport (STEER), promotion of renewable energy sources and energy efficiency in developing countries (COOPENER).

A. Faaij, IEA Task 40, Utrecht University

Bio-Energy Markets, Trade and Future Prospects

- Biomass 30% of primary energy demand; key alternative for oil.
- Biomass resource base:
 - Perennials integrated in Common Agricultural Policy (Central and Eastern European Countries)
 - Develop EU biomass production in global market context (international trade & sustainability issues)
 - Basic research, regional demonstration and industry building embedded in long term programs. (>10 yrs)
- 2nd generation biofuels provide the economics and energy balance to be the winning option.
- Lignocellulosic based EtOH and gasification based synfuels compete.
- For power; co-fired/flexfuel advanced combustion and gasification (Biomass Integrated Gasification/Natural Gas Combined Cycle) key routes.
- Synfuels produced from biomass, coal and natural gas combined with Carbon Capture and Storage and flexible output ratios, provide an ultimate platform in a chaotic transition period.
- Long distance supply chains involve advanced pre-treatment and large scale logistics.
- Lignocellulosic resources for power on shorter term; and for transport fuels on medium term.
- Merge fundamental and applied (industrial) research in coherent programs in international setting.
- Policy should provide the stability for the market for several decades; learn from learning in the past.