

# BIOENERGY2007

**3<sup>rd</sup> International Bioenergy  
Conference and Exhibition**  
From 3<sup>rd</sup> to 6<sup>th</sup> of September 2007



**Jyväskylä Paviljonki  
Jyväskylä Fair and Congress Centre  
Finland**

# Chairman's Message

The EU has made decision on target for the production of energy from renewable sources 2020. The target is 20 %. This means triple from today. The target is very challenge and there will be set mandatory targets for the countries. Still we have to full fill the EU target for the production of energy from renewable sources is 12% by 2010. Modern and environmentally friendly, safe and secure bioenergy, bioenergy technologies and know-how are the driving forces for increasing the utilisation.

BIOENERGY 2007 is the third conference and has been held every second year since 2003. BIOENERGY 2007 Conference and Exhibition is one of the largest and very important event in the field in this year. In 2003 our conference was attended by over 600 participants, and the "Bioenergy in Wood Industry 2005" Conference was attended by over 300 participants. It will take place in the heart of bioenergy: in Finland and in Central Finland. The bioenergy share in Central Finland is over 50 %. There you can see more bioenergy harvesting systems and different scale of power and heating plants in a day than you would see in a week somewhere else. The Conference will focus on the factors affecting the future of the bioenergy, biopower, biofuels in transport and biobased modern technologies and products, including logistic systems, management, total procurement chains, the effects of the energy market, the influence of green marketing and other trends affecting forestry, agriculture, industry and climate.

In the Conference and on the Study Tours you will get updated and concrete knowledge about the modern biomass-based power, heating and CHP plants and technologies from farm scale up to the world's biggest construction. Practical fuel procurement systems, energy technologies, logistics, know-how and experiences, international training possibilities, combustion and harvesting systems and R&D results are presented.

The Conference is not only an excellent highway and opportunity into the modern bioenergy business in Finland. Also tens of oral presentations and posters from all over the world are presented.

The Conference, the Study Tours and the Exhibition are international and the language is English.

I wish you warmly welcome to the Conference in next September! The Conference will focus on the factors affecting the future of the bioenergy opportunities in fuel production, heating and power production in different sectors.

Dan Asplund  
Chairman of the Organizing Committee  
Vice-President of AEBIOM



## Organizing Committee

- Professor Dan Asplund, Chairman
- Professor Rolf Björheden, Sweden
- Professor Rudolf Braun, Institut für Umweltbiotechnologie, Austria
- Dr. Franz-Lambert Eisele, Director, Nord-Rhein Westfalen, Germany
- Mr. Heinz Köpetz, President, Austrian Biomass Association ja AEBIOM, Austria
- Mr. Jim Richardson, Secretary of Canadian Bioenergy Association, J. Richardson Consulting, Canada
- Hilikka Summa, European Commission, Agriculture and Rural Development, Head of Unit, Belgium
- Mr. John Swaan, Executive Director- Wood Pellet Association of Canada.

## National Committee

- Professor Dan Asplund, Chairman
- Ms. Marjatta Aarniala, Senior Technology Adviser, Tekes
- Ms. Eija Alakangas, Senior Research Scientist, VTT
- Professor Pentti Hakkila
- Mr. Juhani Karvonen, Executive Director, Finnish Forest Association
- Mr. Pekka-Juhani Kuitto, Executive Director, FINBIO ry
- Ms. Satu Ranta, Project Managrr, Wärtsilä Biopower Ltd
- Ms. Mia Savolainen, Communication Manager, FINBIO ry
- Mr. Stefan Sundman, Energy and Environmental Policy Manager, Finnish Forest Industries
- Dr.Sc (Tech) Arto Timperi, Development Manager, VTT
- Mr. Reijo Vatanen, Communication Director, Vapo Oy

The Conference will be a focus on the factors affecting the future of the bioenergy, biopower and biobased modern technologies and products, including logistic systems, management, total procurement chains, the effects of the energy market, the influence of green marketing and other trends affecting forestry, agriculture, industry and climate. Bioenergy is important in the heating and CHP sector in the community. Bioenergy in pulp and paper industry has reached a high level in Scandinavia. There is also many possibilities in the wood industry. Biofuel production gives agriculture new possibilities. Also the food industry has potential. Bioenergy can also be used in cement and metallurgia industry.

The Conference will focus on the factors affecting the future of the bioenergy opportunities in fuel production, heating and power production in different sectors.

### Themes

- Bioenergy in Forest Industry
  - Bioenergy in Agriculture and Food Industry
  - Bioenergy in other Industry eg. Cement and Metallurgia
  - Bioenergy in Heating and CHP
- 
- Conference with plenary sessions, oral presentations and poster viewing
  - Technical tours and visits to practical bioenergy targets
  - International Bioenergy 2007 Exhibition
  - Social and cultural programme
  - Language: English

### The Main Program

- 3<sup>rd</sup> of September evening Get together, Registration begins
- 4<sup>th</sup> to 5<sup>th</sup> of September Conference
- 6<sup>th</sup> of September Technical tours/Exhibition

### For whom?

- Bioenergy Business People
- Bioenergy Users and Producers
- Entrepreneurs
- International, National and Local Authorities
- Policy Makers
- Scientists
- Technology Developers
- Designers
- Training Officers, Teachers
- Financiers
- Consumers and Public Organisations
- Wood, Pulp and Paper Industry
- Agriculture and Food Industry
- Heat and Power producers
- Power Plant and Heating Plant Producers
- Consumers and Public Organisations

### Topics

1. Strategies, Politics, Legislation Tools and Implementation Issues: possibilities to support the EU-targets, Kyoto Protocol, the Johannesburg decisions, national targets and free energy markets and green values, sustainable development and security of energy supply
2. Bioenergy Markets and Business: national and international bioenergy markets, financial and market instruments, green certificates and markets, fuel quality assurances and standards, price competitiveness, management systems
3. Biomass Resources: potentials, quantities, measurements methods, qualities and properties for feedstock from forestry, agriculture, peatlands, municipals and processing industry
4. Fuel production, logistics and technologies: production, pre-treatment, procurement, transport and logistics
5. Combustion and boiler systems: combustion and boiler technologies and systems for industries, district heating, house blocks, small houses and agriculture nets
6. Combined Heat and Power Production (CHP): powerplant, district heating and small scale technologies and systems for CHP production
7. Chemical Conversion Technologies: gasification, pyrolysis, biological conversion and liquid fuels production (biodiesel, ethanol, direct/indirect liquerfaction)
8. Solid Conversion: Pellets and briquettes etc. and REF.s
9. National and Areal Demonstration and Market Implementations of Bioenergy Production and Use in different Bioenergy Sectors
10. Environmental Issues: flue gas cleaning, ash handling and recycling, sustainable development
11. Applications of information and communication technologies: internet, mobile phone technology, electronic documentations, remote management tools, internet marketing and information dissemination.

The different topics covers R&D results, demonstration, cases, equipments and good practises.

# Welcome to Finland

## - The Bioenergy Country

### Finland

- Finland is one of the world leaders in the utilisation of wood based bioenergy and the development of biomass combustion technologies and efficient fuel supply chains. The expertise extends from the forest to heating and power plants, from root to soot.
- Finland is a top bioenergy country among the Western Countries. Almost 30 % of total primary energy consumption and 20 % of electricity is met by bioenergy (including peat).
- Finland is the world leader in the development of biomass combustion technology and the manufacture of fluidised bed boilers that are suitable for burning different kinds of biomass (wood fuels, peat, REFs etc.). The advantages offered by fluidised bed technology include high efficiency and low emissions.
- In Finland, you can see in concrete the modern bioenergy power and heating plants and technologies from farm size up to the world's biggest construction. Practical know-how and experiences, energy technologies, logistics, various fuel procurement systems, international training possibilities, combustion and harvesting systems and R&D results are presented.
- And Central Finland is the Centre of Bioenergy!

Finland is one of the world's leading countries in utilising renewable energy sources. About 26 % of Finland's consumption of primary energy is produced by bioenergy. With this share bioenergy is the biggest resource of energy in Finland. The share of bioelectricity, which is 20 % today, is the highest in the European Union.

In Finland energy technology has become a significant field of exports in the recent decades. This progress is closely related to the development of Finland's energy supply system and energy intensive industries. This development has been boosted by the needs of the domestic market, the challenge being rigorous climate and an abundant supply of biomass.

Our energy industry is of great significance in Finland's industrial structure, being closely intertwined with our traditional branches, forest and metal industries but also the electronics industry. These ties have produced, for example, expertise in different technological areas. Finland is a leading country in the development of biomass combustion technologies combined heat and power production and efficient fuel supply systems. The expertise extends from forests, peatlands, urban and industrial waste to heating and power plants. Bioenergy in wood industry is of importance both producing forest fuels, pellets and in producing heat and power. Finland is also the world leader in the manufacture of fluidised bed boilers that are suitable for burning all kinds of biomass. In Finland you can see in practice modern plants and technologies from a farm size up to the world's biggest biomass power plant, 220 MW electricity. Many universities, institutes, schools and private companies provide education and training in forestry and energy technology, from the practical knowledge courses to the level of highest scientific research.

Energy and energy business are global. The use of bioenergy grows rapidly everywhere. Bioenergy has many positive effects also when battling against the climate change. Also Finland has set challenging targets for to increase further the use of biomass. The National Action Plan for Renewable Energy Sources was launched in 1999 and updated in 2002. By 2010, the use of bioenergy energy sources should be 30 per cent higher than in the year 2001. The National Climate Strategy, launched by the Finnish Government in 2001, highlights the targets and measures to meet the Kyoto commitments. By the years 2008-2012 emissions of greenhouse gases should be reduced to the level of 1990. Today the new Energy and Climate Strategy coordinated by the Ministry of Trade and Industry is in the hands of the Parliament members. The new concrete targets extend to the year 2015 and the aim is to continue the increase on bioenergy Both in electricity and heat production but also for traffic purposes.

In Finland, the role of additional financial incentives has been confirmed to be crucial for the development, demonstration and deployment of new technologies. The implementation of high-efficiency, sophisticated technology has been shown to be the best guarantee for increasing the use of bioenergy.

Warmly Welcome to Finland!

Mr. Mauri Pekkarinen  
Minister of Trade and Industry



# Greetings from the Mayor of Jyväskylä



Jyväskylä is one of Finland's five most important centres of growth. In recent years the population of our area has grown at record speed compared to the country as a whole. Jyväskylä is in fact the second most popular place in Finland to move to. Finns have also ranked Jyväskylä as offering the country's best environment in which to live and bring up children.

The Jyväskylä region is widely known for strong networked cooperation which involves ten municipalities and numerous organisations, enterprises and other bodies. Through broad-ranging collaboration we are intent on reinforcing the region's success. The goal is also to produce more and more services across municipal boundaries.

The key characteristic of this youthful and vital region is international top-quality education and expertise. A second characteristic is multi-actor operating environments in research and development activity. In practice this means that within the same operating environment enterprises, research establishments as well as training and development organisations are all to be found.

Traditionally the Jyväskylä region has relied on the forest and metal industries and more recently on information and communication technology. The focuses of attention in the region's primary branches are the production and use of bioenergy, forest industry processes and the international forest industry, as well as areas of emphasis in environmental technology such as biogas technology.

The heart of bioenergy is Central Finland, where bioenergy accounts for 50 % of consumption. In Central Finland it is possible to see more biofuel production systems and different scale power and heating plants in a day than in a week elsewhere. Wood fuel is used in combined heat and power plants in the paper and wood industries. Jyväskylä Science Park, which includes a bioenergy cluster, as well as many other bioenergy organisations are located in Central Finland. In addition, the region is home to various bioenergy education and R&D institutes such as the University of Jyväskylä, Jyväskylä Polytechnic, VTT Processes with its bioenergy department, the BENET Bioenergy Network, and FINBIO – the Bioenergy Association of Finland. Large biofuel production companies and forest industry players such as Vapo, Biowatti, Metso, UPM Kymmene and M-Real as well as energy companies and bioenergy marketing companies of different sizes also conduct national and international business from bases in Central Finland. Jyväskylä town is planning a new wood and peat based power plant with a fuel capacity of 500 MW. The electricity output will be 150 MW. The plant will also include a unit for production on pyrolysis oil

Welcome to Jyväskylä, home of the world famous architect Alvar Aalto, world champions in various sporting disciplines, and the world's best organised rally, Neste Rally Finland. We sincerely hope you find this human-sized city and the unspoilt lake and forest scenery that surrounds it to your liking.

Mr. Markku Andersson  
Mayor



# Conference and Travel Information

## Conference Venue

The International Bioenergy Conference will take place in the Jyväskylä Paviljonki – International Congress and Trade Fair Centre. Jyväskylä Paviljonki is truly a most versatile congress and trade fair centre in the heart of Finland, in the centre of the city. Paviljonki stands close to the train and bus station, and is well connected to the highways. The airport is only 20 kilometres away.

The complete address is:  
Jyväskylä Paviljonki, Messukatu 10,  
FI-40100 Jyväskylä, Finland  
[www.jklpaviljonki.fi](http://www.jklpaviljonki.fi)

## Fees

### Registration and payment before June 30

- For members of the FINBIO 450 €
- For non-members 520 €
- Student 150 €. A valid student card or letter from a university will be required as a proof.

### Registration and payment after June 30

- For members of the FINBIO 520 €
- For non-members 600 €
- Student 150 €. A valid student card or letter from a university will be required as a proof.

### Please note: after June 30, payments of lower fees will not be accepted.

- Conference Dinner 60 €

## Technical Tours

### on Monday, September 3<sup>rd</sup>

- Pre-conference Tour 100 €

### on Thursday, September 6<sup>th</sup>

#### in Central Finland

- New Technologies for Large Scale Production of Forest Fuels for CHP  
120 €
- Small-Scale BIO-CHP and Areal District Heating Solutions (1-10 MW)  
120 €
- Education, Training and Practical Experiences over Bioenergy in Central Finland  
60 €

## The full fees include

- Attendance at all Oral Sessions and Poster Presentations
- Invitation to all coffee breaks and lunches
- Admittance to the Bioenergy 2007 and Wood and Bioenergy 2007 Exhibitions
- Conference bag and proceedings
- Reception by the City of Jyväskylä
- Exhibitions opening night

## Registration

If you wish to attend the Conference, please complete the Registration Form in this Brochure and send it by mail to  
FINBIO ry, Vapaudenkatu 12,  
FI-40100 Jyväskylä, Finland  
by fax to +358-207 639 609 or  
by e-mail to [bioenergy2007@finbio.fi](mailto:bioenergy2007@finbio.fi).  
It is also possible to fill the registration form on the website, [www.finbioenergy.fi/bioenergy2007](http://www.finbioenergy.fi/bioenergy2007).  
Please, complete one form per participant.

## Payment options

The payment for Registration must be made in euro. Your registration will be confirmed upon the receipt of the registration fee. Admittance to the Conference without full registration including the payment of the registration fee cannot be granted. The following options for advanced payment are available:

- By bank transfer

Bank: Sampo Bank Plc.

Account holder: FINBIO – Suomen Bioenergiayhdistys ry

Account number: 800011-70312087

SWIFT code: PSPBFIHH

IBAN: FI9680001170312087

- By credit card

Visa/Mastercard/Eurocard/American Express/accepted.

## Registration Desk

All participants must register on arrival at the Conference. The Registration Desk will be open during the following hours:

Monday, September 3 <sup>rd</sup> , 2007,	14:00 – 19:00
Tuesday, September 4 <sup>th</sup> , 2007,	8:00 – 17:30
Wednesday, September 5 <sup>th</sup> , 2007,	8:00 – 16.30

With the registration, you will be given detailed information about the conference, conference bag and an identification badge that should be worn at all times. If you lose your badge or find a badge, please report to the Registration Desk.

## Cancellation

If you cancel your registration before July 31<sup>st</sup>, 2007, 50 % of your registration fee will be refunded. There will be no refunds for cancellations made after the July 31<sup>st</sup>, 2007.

## Conference language

The conference language will be English. There will also be simultaneous translation from English into Finnish

# Social Programme

## Lunch and coffee breaks

Lunch and coffee will be served during the breaks as indicated in the Conference Programme.

## Information Centre

During the conference, information and help may be obtained at the Registration Desk. The information board are situated near the desk. The Programme Board displays the Conference Programme for the entire week, with all last-minute changes.

## Insurance

The organizer cannot be held responsible for injury to conference attendees or for damage to, or loss of their personal belongings, regardless of the cause. Attendees are advised to make their own insurance arrangements.

## Visa

Participants requiring a visa entry in Finland are strongly advised to make their application in their home countries as early as possible before the intended date of arrival.

## Travel Information

Travel to Jyväskylä and how to reach Jyväskylä Paviljonki – International Congress and Trade Fair Centre

### By air:

Several flights daily from Helsinki (flight time 35 min).  
[www.finnair.fi](http://www.finnair.fi)

### By rail:

Several trains daily from Helsinki (3 to 4 hrs).  
[www.vr.fi](http://www.vr.fi)

### By road:

Jyväskylä is situated in central Finland at the crossroads of four highways. Jyväskylä is just over three hours from Helsinki and only four hours from Oulu. All the highways come direct to the intersection of the Exhibition Centre (please follow Paviljonki signs).

The pedestrian bridge from the city centre leads directly to Paviljonki.

## Reception by the City of Jyväskylä

On Monday evening, September 3<sup>rd</sup>, there will be a reception hosted by the City of Jyväskylä for Bioenergy 2007 participants.

The reception will begin at 20:00. An invitation will be included in your conference bag.

## Conference Dinner

The Conference Dinner will take place on Thursday evening, September 4<sup>th</sup>.

Dinner will cost 60 €.

Dinner speech: Joensuu Regional Development Company JOSEK Ltd. and Finnish Energy Industries.

## Exhibitions Opening Night

On Wednesday evening, September 5<sup>th</sup> Jyväskylä Fair Centre will arrange an Exhibitions opening night for participants for Bioenergy 2007 and exhibitors for Wood and Bioenergy 2007.

Opening ceremony at 18:00 – 19:00 and Customer get-together at 19:00 – 21:00.

An invitation will be included in your conference bag.



# Conference Programme September 4<sup>th</sup>

## Opening Session

9.00

### Opening

Professor Dan Asplund, Charman of The Bioenergy 2007 conference

### Bioenergy Policy in Finland

The Represent of the Fininsh Goverment

### Bioenergy Policy in EU

n.n EU (tbc)

### Development of Bioenergy in Europe

AEBIOM president Heinz Köpetz, Austria

### Bioenergy from Agrobiomass - EU Policy Framework and Implications for Agricultural Markets

Head of Unit Hilka Summa, European Comission, Agriculture and Rural Development, Belgium

### Global Trends in Bioenergy Business

CEO Henrik Lundberg, Talloil Ab, Sweden

### Canada's Sleeping BioEnergy Economy

Executive Director John Swaan, Wood Pellet Association of Canada, Canada

### How Shall We Use Limited Biomass Resources?

CEO Matti Hilli, Vapo Oy, Finland

11:30

Lunch and Poster Session

## Bioenergy Strategies

13:00

### Performance Analysis of Policy Mechanisms Promoting Electricity from Renewable Biomass in the EU

Niina Katariina Kautto, European Commission, DG Joint Research Centre, Italy

### Sustainable Forestry Systems for Bioenergy

Founding director Jim Richardsson, Canbio, Canada and IEA Task Leader

Adding Value to Forest Biomass

Vice President Energy Anja Silvennoinen, UPM-Kymmene Oyj, Finland

### Wood Energy Development in Nord-Rhein Westfalen

Head of Forest Administration Franz-Lambert Eisele, Ministry of Environment, State of North Rhine-Westphalia, Germany

### Bioenergy Strategies in Baltic Sea Region

Technology Manager Satu Helynen, VTT, Finland

### Neste Oil Global Biodiesel Strategy

Executive Vice President, Biofuels Kimmo Rahkamo, Neste Oil Oyj, Finland

15:00

Coffee

### Bioenergy Possibilities in North-West Russia

Keijo Mutanen, Joensuu Regional Development Company JOSEK Ltd

### Efficient Paths for Biomass Development Up To 2050

Lukas Kranzl, Gerald Kalt, Reinhard Haas, Energy Economics Group, Institute of Power Systems and Energy Economics,Vienna University of Technology, Austria

### The Markets for Emission Allowances and Reductions – Compliance and Business

Tomas Otterström, GreenStream Network Ltd, Finland

### ProMidNord - Sustainable Development in the Mid Nordic Region

Tytti Laitinen, Jyväskylä Innovation Ltd, Finland

### Biomass as Energy Resource of Bosnia and Herzegovina

Petar M.Gvero, University of Banja Luka, Bosnia and Herzegovina & Sein Petrović, IGT R&D Centre for Gas Technology, Bosnia and Herzegovina & Grant Ballard-Tremeer, ECO Ltd., United Kingdom & Sladjan Maslač, UNDP, Banja Luka Office, Bosnia and Herzegovina

### Biofuels in Central America, a Real Potential for Commercial Production

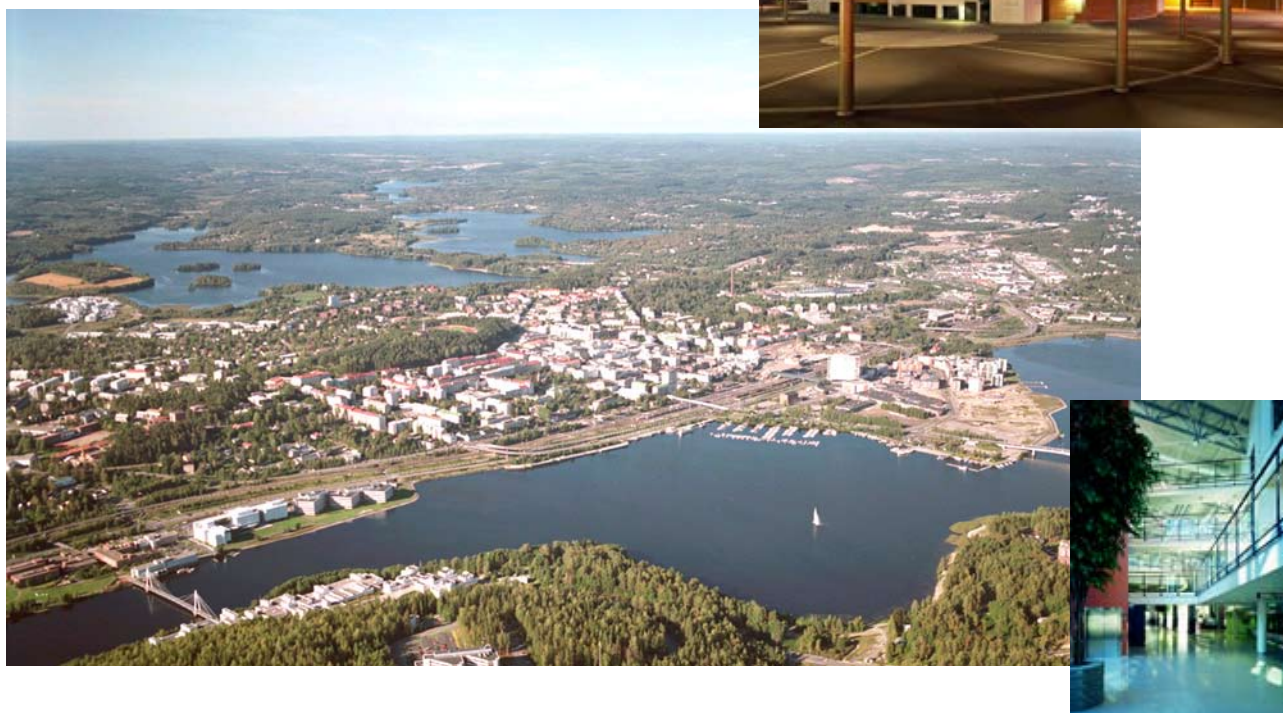
Otto L. García, Regional Coordinator, Energy and Environmental Partnership with Central America (EEP), El Salvador. (tbc)

### Ontario's Commitment to Building a Biomass Economy: Opportunities for Technology Transfer

Jens-Peter Barynin, Forest Sector Competitiveness Secretariat, Ontario Ministry of Natural Resources

17:50

End of the day



## Biogas

13:00

### Recent Developments in Biogas Technology

Animari Lehtomäki, Jyväskylä Innovation Ltd. & Teija Paavola and Jukka Rintala, University of Jyväskylä, Finland

### EU Croppen - Biogas from energy crops and agrowastes

Charles Banks and Andrew Salter, School of Civil Engineering and the Environment, University of Southampton

### Biogas in Belgium, a SWOT Analysis

Bruno Mattheeuws and Filip Velghe, Biogas-E vzw & Margriet Drouillon, University College of West-Flanders, Belgium

### Co-digestion of Industrial By-Products with Pig Slurry in a Full-Scale Biogas Plant: Methane Yields and Fertilizer Value of the Digestate

Maikel Timmerman and Herman de Boer, Animal Sciences Group, The Netherlands

### An Integrated Business Model for the Biogas Business

Magnus Gustafsson & Magnus Hellström, PBI – Research Institute for Project Based Industry and Åbo Akademi University & Tommy Ranta, PBI – Research Institute for Project Based Industry & Robert Stoor, Åbo Akademi University, Finland

### Development of Biogas in Denmark, n.n

15:00

Coffee

## Transport Biofuels

15:30

### Thermochemical Options for Biofuels Production

David C. Dayton, National Bioenergy Center and Paul Grabowski, U.S. Department of Energy, Usa

### Development with the Biorefinery Concept

Kai Sipilä, VTT, Finland

### Peat to Liquids

Kari Mutka, Vapo Oy, Finland

### Pressurized CFB Gasification of Biomass for Synthesis Gas Generation, - the EU CHRIGAS Project

Sune Bengtsson and Ola Augustsson, VVBGC - Växjö Värnamo Biomass Gasification Centre, Växjö University & Lars Waldheim, TPS – Termiska Processer AB, Sweden

### Development of wood-based BTL at Varkaus demo-plant

Hannu Kaikkonen, Neste Oil Oyj

### Behaviour of Inorganics and Refractory Lining Design in an Entrained Flow Reactor for the Production of BtL

Jérôme Berjonneau, Jacques Poirier and Laetitia Colombel, CNRS-CRMHT & Michel Pichavant, CNRS-ISTO & Françoise Defoort, CEA LPTM DTN/SE2T/LPTM, France

### Greenhouse Gas and Energy Balances of Biomass-Based Transportation Fuels in Finland

Tuula Mäkinen, VTT, Finland

17:50

End of the day

Changes in programme are possible.

# Conference Programme September 5<sup>th</sup>

## Biomass Resources

- 8:30 Energy Use of Wood - Adding Value?**  
Forest Director Bernard de Galembert, CEPI, Belgium
- Integrated Use of Wood for Industry and Energy**  
Director Pertti Laine, Finnish Forest Industries Federation, Finland
- Potential of Biofuels in Sweden**  
Matti Parikka, Swedish University of Agricultural Sciences, Department of Bioenergy, Sweden
- Predictive Models of Biomass for Poplar and Willow Short Rotation Coppice in the United Kingdom**  
Brewer A.C., Morgan G.W, Poole E.J., Baldwin M.E and Tubby I., Biometrics Division, Forest Research, Alice Holt Research Station, United Kingdom

## Fuel Production

- 8:30 Efficient Handling of Biomass by Vibrating Floor**  
Jean-Claude Poncet, Silexport International, France
- The Development of Reed Canary Grass Fuel Chain**  
Tuulikki Lindh, Janne Kärki, Teuvo Paappanen, Timo Leino and Esa Kallio, VTT & Samuli Rinne, YTY-konsultointi & Timo Lötjönen and Mika Isoalahti, MTT-Agrifood Research Finland & Anna-Maija Kirkkari, TTS - Work Efficiency Institute, Finland
- Residual Biomass Energy: A Modified Round Baler for Wine Shoots Recovery**  
Gianni Alemanno and Stefano Cotana, Biomass Research Centre – University of Perugia, Italy
- Development of Forest fuel in Sweden**  
Professor Rolf Björheden, Växjö University, Sweden

9:50 Coffee

9:50 Coffee

- 10:20 Possibilities for Energy Wood Procurement and Use in Northwest Russia**  
Timo Karjalainen, Yuri Gerasimo, Vadim Goltsev, Jan Ilavský and Timo Tahvanainen, Finnish Forest Research Institute, Finland
- Wood Biomass Potentials in Brandenburg – Growing Competition Between Industry Timber and Energy Wood**  
Dieter Sasse, CEBra – Centre for Energy Technology Brandenburg GmbH & Severine Laufer, University of Applied Sciences Eberswalde, Germany
- Energy Wood Thinning Alternatives in Management of Scots Pine and Norway Spruce Stands**  
Matti Siren, Jani Heikkilä, Jari Hynynen and Tiina Sauvula, Forest Research Institute, Finland
- Integrated Planning Tool for Optimising Bioenergy Production from Regional Biomass Waste and Its Application in the Murrumbidgee Irrigation Area, Australia**  
Napat Jakrawatana, Stephen Moore and Iain MacGill, University of New South Wales, Australia

- 10:20 Cost of Forest Biomass Supply and Harvesting Technology Markets in the EU27**  
Antti Asikainen, Juha Laitila and Harri Liiri, Finnish Forest Research Institute Finland
- A New Technique for Compression of Tree Bunches from Young Stands**  
Dan Bergström, Tomas Nordfjell and Urban Bergsten, Swedish University of Agricultural Sciences, Sweden
- Integrated Harvesting of Pulpwood and Energy Wood from First Thinnings Using the Bundling Method**  
Paula Jylhä and Juha Laitila, Finnish Forest Research Institute & Kalle Kärhä, Metsäteho Oy, Finland

11:40 Lunch and Poster Session

11:20 Lunch and Poster Session

## Trade and Technology Transfer

- 13:10 Biomass Trade in Europe - Analysis of Current Markets and Future Prospects by the EIE Project EUBIONET II**  
Eija Alakangas, VTT, Finland
- Renewable Heat Pilots, Results from Project 5Eures**  
Asko Ojaniemi, Jyväskylän Innovation Ltd., Finland
- Forest fuel procurement in Eastern Europe - case-study results from Poland and the Czech Republic**  
Arvo Leinonen, VTT, Finland
- Building of Biofuel Supply Chain to Vilnius**  
Arūnas Bruzgulis, UAB BIONOVUS, Lithuania
- Energy and Environment Partnership with Central America, EEP**  
Markku Nurmi, President of EEP, Finland

- 12:50 Introduction Aebiom Restmac Project Workshop**  
Edita Vagonyte, European Biomass Association – AEBIOM, Belgium
- Machinery and Supply Chains in the Production of Forest Chips in Finland**  
Kalle Kärhä and Arto Kariniemi, Metsäteho Oy, Finland
- Production of Stump Wood Fuel**  
Christer Backlund, UPM-Kymmene Forest, Finland
- Forest Residue Bundling Technology for Alpine Conditions**  
Forsttechnik Viktor von Atzigen, von Atzigen AG, Switzerland
- Technology Presentation**

14:50 Coffee

## 15:20 Closing Session

16:20 End of the day

# Conference Programme September 5<sup>th</sup>

## Combustion and Gasification

### 8:30 Development of Fluidized Bed Combustion

Jouni Hämäläinen, VTT, Finland

### Emissions Evaluation and Energy Balance of Combustion Processes Carried Out on a Gasifying Wood Stove

Baggio P., Grigante M. and Baratieri M., University of Trento, Italy

### Emissions and Emission Reduction in Small Scale Wood Log Burning Appliances

Heikki Oravainen, VTT, Finland

### Combustion Behaviour of Various Agricultural Biofuels –Emissions and Relevant Combustion Parameters

Elisabeth Wopienka, Lara Carvalho and Günther Friedl, Austrian Bioenergy Centre GmbH, Austria

9:50 Coffee

### 10:20 Bio-Mass Gasification in Industrial Applications - A Feasible Way to Cut Down CO2 Emissions and Oil Dependency

Olavi Raunio and Sampo Tukiainen, Absolute Energy Inc., Finland

### Development of High-Efficiency Small-scale Biomass Gasification Process

Maromu Otaka, Masami Ashizawa, Kazuhiro Kidoguchi and Masayuki Tashiro, Central Research Institute of Electric Power Industry (CRIEPI), Japan

### The first pellets heated social housing project in Belgium

Johan Van Bael and Ruben Guisson, Vito &

Luc Stijnen, Zonnige Kempen, Belgium

### New methods of characterizing properties of wood pellet raw materials in relation to pellet mill load and pellet quality

Niels Peter K. Nielsen and Claus Felby, Forest & Landscape,

Faculty of Life Sciences, University of Copenhagen &

Per Ottosen. Dong Energy & Torben Poulsen, Statoil A/S, Denmark

11:40 Lunch and Poster Session

## Combined Heat and Power (CHP)

### 13:10 Micro-Scale CHP Based on Biomass – Intelligent Heat Transfer with Thermoelectric Generators

Wilhelm Moser and Günther Friedl, Austrian Bioenergy Centre GmbH

& Hermann Hofbauer, Vienna University of Technology, Austria

### The Wood Fired Combined Heat and Power Installation for Green Houses (and District Heating)

Herman Klein Teeselink, HoSt B.V., The Netherlands

### Co-Firing of Biomass and Brown Coal in Zvolen CHP Plant – Contributing to the Regional Development, Increasing the Business Opportunities and Improving the Environment

Ján Ilavský, Juha Laitila and Timo Tahvanainen, Finnish Forest Research Institute, Finland & Július Jankovský, Zvolenská teplárenská a.s. & Ján Tuček, Milan Koreň and Vladimír Pápaž, Technical University Zvolen, & Mária Žiaková, Institute of Forest Resources and Informatics NLC Zvolen, Slovakia

### BioPower CHP Plants - Reliable and Efficient

Jussi Rätty, Wärtsilä Biopower Oy, Finland

### The Technical and Commercial Status of the Novel Power Plant

Ilkka Haavisto, Condens Oy, Finland

14:50 Coffee

## 15:20 Closing Session

16:20 End of the day

# Poster Presentations

## I. Strategies, Politics, Legislation Tools and Implementation Issues

- 1.1 **Biomass from Willow Plantation as Resource of Renewable Energy**  
Michał Jasiulewicz, Koszalin University of Technology, Poland
- 1.2 **Bioenergy Development in Ukraine: Present Status, Perspectives and New Possibilities in Frame of Kyoto Protocol Mechanisms.**  
Georgiy Geletukha, Tetyana Zhelyezna, Yuri Matveev and Mykola Zhovmir, Institute of Engineering Thermophysics of National Academy of Sciences of Ukraine, Scientific Engineering Center "Biomass", Ukraine
- 1.3 **Energy Use and CO<sub>2</sub> Emissions in the Pulp and Paper Industry**  
Cecilia Tam and Dolf Gielen, International Energy Agency, France
- 1.4 **Role of Biomass in Global Energy Supply: Multidiscipline Approach for Optimisation**  
Tero Tynjälä, Department of Energy and Environmental Technology, Lappeenranta University of Technology and Tommi Tynjälä, GreenStream Network Ltd., Finland
- 1.5 **Status of Bio-Energy in Sub-Saharan Africa: a Review**  
ustapha Kaluwe Seidu and Demel Teketay, FSC Africa, Ghana

## 2. Bioenergy Markets and Business

- 2.1 **Challenges and opportunities of international biomass market: findings from a scenario study**  
Jussi Heinimö, Ville Ojanen and Tuomo Kässi, Lappeenranta University of Technology, Finland
- 2.2 **Economic effectiveness of biomass utilization for electricity generation – case example of the Czech Republic**  
Jaroslav Knápek, Jiří Vašíček, Oldřich Starý and Martin Beneš, Czech Technical University, Czech Republic
- 2.3 **Scenarios on wood-based bioenergy business up to 2020 in Finland**  
Satu Helynen, VTT & Antti Asikainen, Finnish Forest Research Institute, Finland
- 2.4 **Structured Implementation of Bioenergy Projects**  
Jonas Nylund, Citec Engineering Oy, Finland

## 3. Biomass Resources

- 3.1 **Comparison Among Dedicated Energy Crops: Biomass Partitioning and Ash Content**  
Guido Bezzi, Andrea Monti, Angela Vecchi, Giuseppe Pritoni and Gianpietro Venturi, Department of Agroenvironmental Science and Technologies, University of Bologna, Italy
- 3.2 **Biomass for Energy From Serbian Forest Resources**  
Dragana Drazic and Milorad Veselinovic, Institute of Forestry & Ljubinko Jovanovic, Center for Multidisciplinary Research & Srdjan Bojovic, Institute for biological Research "Sinisa Stankovic", Serbia.
- 3.3 **Cereal Straw Availability for Energy Production in Regions of Ukraine**  
Mykola Zhovmir, Institute of Engineering & Anatoliy Bashtovyy, Scientific Engineering Centre "Biomass", Ukraine
- 3.4 **How to Analyze and Maximize the Forest Fuel Supply Availability to Power Plants in Eastern Finland**  
Tapio Ranta and Antti Ala-Fossi, Lappeenranta University of Technology, Finland
- 3.5 **Optimum Utilisation of Resources used in Producing Bioenergy**  
Prafulla S Shirke, India
- 3.6 **Biomass Supply Potential in Nepal**  
Deepak Kumar Kharal and Bishwa Nath Oli, Department of Forest Research and Survey, Nepal

- 3.7 **Production Potential and Market Prospects for Energy Wood And Energy Crop in Finland: A Survey of Landowners' Aims and Perceptions**  
Anna-Kaisa Rämö, Erno Järvinen, Terhi Latvala and Ritva Toivonen, Pellervo Economic Research Institute (PTT) & Harri Silvennoinen, University of Joensuu, Finland
- 3.8 **Possibility of Using Olive Kernel Wood in Crete for Pellets Production**  
John Vourdoubas, Tei Of Crete, Greece
- 3.9 **Moisture Content of Harvested Stump-Root System**  
Risto Lauhanen and Jussi Laurila, Seinäjoki University of Applied Sciences, Finland
- 3.10 **Status of the Forest Residue in the Forests and Lumberyards of Yamanashi Prefecture, Japan**  
Masayuki Ozawa, Hiroshi Saito, Osamu Akiyama and Shigeki Kobayashi, Yamanashi Forestry Research Institute & Masahiro Iwaoka and Satoshi Otuji, Tokyo University of Agriculture and Technology, Japan
- 3.11 **Application of the Yield-SAFE Model on Alley Cropping Systems**  
Dirk Freese and Holger Grünewald, Brandenburg University of Technology, Germany & Wopke van der Werf, Wageningen University, Group Crop & Weed Ecology & Karel Keesman, Wageningen University, Group Systems & Control Group, The Netherlands
- 3.12 **Results from Empirical Models of Standing Biomass for Willow Grown as Short Rotation Coppice**  
Baldwin M.E., Morgan G.W. and Poole E.J., Biometrics Division, Forest Research, Alice Holt Research Station, United Kingdom
- 3.13 **Potential for Energy Production from Biomass in a Region of Portugal**  
U. Fernandes and M. Costa, Instituto Superior Técnico & Elsa Nunes, IrRADIARE Lda, Portugal
- 3.14 **Using Wood Residues as Biomass for Cooking Energy in Cambodia**  
Sophanarith Kima and Masao Koikea, Faculty of Agriculture, Shinshu University, Japan
- 3.15 **Life Cycle Assessment of Giant Reed, Switchgrass, Miscanthus and Cynara from "Cradle to Farm-Gate"**  
Simone Fazio, Andrea Monti and Gianpietro Venturi, Department of Agroenvironmental Science and Technologies, University of Bologna, Italy
- 3.16 **A Methodology for Analyzing the Potential of Forest Residuals as a Renewable Source of Energy in the Czech Republic**  
Kamila Havlíčková and Jan Weger, Silva Tarouca Research Institute for Landscape and Ornamental Gardening (RILOG), Jaroslav Knápek and Jiří Vašíček, Czech Technical University & Jiří, ÚHUL České Budějovice, Czech Republic.
- 3.17 **Measurement Demands and Novel Solutions for Forest Fuels – the Finnish State-of-Art**  
Jari Lindblad and Erkki Verkasalo, Finnish Forest Research Institute, Finland
- 3.18 **The potential of forest residues in Finland to decrease greenhouse gas emissions in transportation in traffic sector – future alternatives**  
Riitta Korhonen and Sampo Soimakallio, VTT, Finland

## 4. Fuel production, logistics and technologies

- 4.1 **Biomass Supply Chain Management System – Application to the Energy Use of Forest Biomass Residues in Portalegre Region, Portugal**  
Marcos António Nogueira, Rui Pedro Henriques and Elsa Nunes, IrRADIARE, Science for Evolution, Ltd., Portugal

- 4.2 Distributing Biomass as Synthetic Natural Gas (SNG)**  
R. Zwart and A. van der Drift, Energy research Centre of the Netherlands, The Netherlands
- 4.3 Elf-Heating and Terpene Emission from Stored Biofuels**  
Katarina Rugar-Gadd, Ulrika Welander and Mehri Sanati, Division of Bioenergy, School of Biosciences and Process Technology, Växjö University & Lars Wadsö, Division of Building Materials, Lund Institute of Technology, Lund University & Göran Holmstedt, Department of Fire Safety Engineering, Lund Institute of Technology, Lund University & Patrick van Hees, SP Technical Research Institute of Sweden, Sweden
- 4.4 Forest Fuel Procurement at Zabreh Power Plant**  
Arvo Leinonen and Matti Virkkunen, VTT, Finland
- 4.5 Forest Fuel Supply Chain Based on Terminals and Stumps**  
Antti Ala-Fossi, Tapio Ranta, Tomi Vartiamaäki and Eero Jäppinen, Lappeenranta University of Technology, Finland.
- 4.6 Forest Fuel Systems in Sweden - State of the art 2007**  
Maria Iwarsson Wide, Skogforsk, Sweden
- 4.7 Fuel Procurement Technology at Bialystok Power Plant**  
Arvo Leinonen and Matti Virkkunen, VTT, Finland
- 4.8 Harvesting of Stumps for Fuel - Productivity and Cost**  
Juha Laitila and Antti Asikainen, Finnish Forest Research Institute & Antti Ala-Fossi and Tapio Ranta, Lappeenranta University of Technology, Finland
- 4.9 Integrating Small Scale Renewables: Bio-Gas, Bio-Ethanol, Bio-Diesel & Solar Concentrator Heat Assist**  
Hal Mettes, DESCO, Usa & Art Medina, Mustard Seed Foundation, Philippines & Jon Bohmer, Kyoto Energy Ltd., Norway
- 4.10 More Efficient Forest Fuel Systems - a Swedish Research and Development Programme**  
Gunnar Svenson, Skogforsk, Sweden
- 4.11 Occupational Health Hazards in the Handling of New Biofuels**  
Sirke Ajanko-Laurikko and Leena Fagnäs, VTT Technical Research Centre Of Finland, Finland
- 4.12 Procurement of Forest Residues: Creating Markets for Renewable Energy Technologies**  
Edita Vagonyte, European Biomass Association – AEBIOM, Belgium
- 4.13 The CTL and Energy Wood Production Technologies Transfer Opportunities to the Forestry Industry of Eastern Europe**  
Marcin Pisarek, European Forestry Institute & Juha Laitila, Finnish Forest Research Institute & Antti Ala-Fossi, Lappeenranta University of Technology, Finland
- 4.14 The Mechanized Harvesting Costs Comparison in Poland with Harwarder Options in Thinning Cuts for the Production of Energy Wood**  
Marcin Pisarek, European Forestry Institute and Kari Väättäinen Finnish Forest Research Institute, Finland
- 4.15 Towards More Cost-Efficient Harvesting of Energy Wood and Pulpwood in Early Thinnings**  
Kalle Kärhä, Metsäteho Oy, Finland
- 4.16 Waterway Transportation Potential of Forest Fuels in the Lake Saimaa Region**  
Kalle Karttunen, Tapio Ranta, Eero Jäppinen, Kai Andersin and Essi Hämäläinen, Lappeenranta University of Technology, Finland
- 4.17 Watt Specialist Software for Bioenergy Networks. More and Better Bioenergy with Less Work from Smaller Areas**  
Seppo Huurinainen and Olli Ikonen, Geographic Information System Services MHG Ltd, Finland
- 5 Combustion and boiler systems**
- 5.1 Characteristics of Biomass Combustion and Its Significance in Boiler Designs**  
Dilip W Bapat, Thermax Limited, India
- 5.2 Comparison of the Use of Sunflower, Cotton and Rape Seed Crude Oils as Fuel in a Compression Ignition Engine**  
Athanasios Balafoutis, Dionysios Melas, Athanasios Natsis and George Papadakis, Agricultural University of Athens & Areti Papagianopoulou, Institute of Agricultural & Environmental Technology, Greece
- 5.3 Different performance of the poplar chips and pellets combustion in a 500 kWth commercial hot water boiler**  
José Maria Murillo Laplaza, Raquel Ramos Casado, Elena Borjabad García and Alfonso Pascual Delgado, Ciemat – Centro De Investigaciones Energéticas, Spain
- 5.4 Experimental Investigation of Baled Straw Burning**  
Sergiy Chaplygin, Mykola Zhovmir, Georgiy Geletukha and Yevgen Oliynik, Scientific Engineering Centre “Biomass”, Ukraine
- 6. Combined Heat and Power Production (CHP)**
- 6.1 District Heating in Alpine Communities: a Case Study in the Primiero Valley**  
S. Scalet, M.G. Cantiani, P. Baggio, M. Baratieri and M. Grigante, Department of Environmental and Civil Engineering, University of Trento, Italy
- 6.2 Economic Investigation of ICECHP Using Gasohol – A Case Study for Iran**  
Barat Ghobadian, Tarbiat Modares University & Mohamad Ameri and Iman Baratian, Power and Water University of Technology, Iran
- 6.3 Electricity Generation from a 200 kW Thermal Power Plant Using Wood Residues from a Sawmill Industry in Brazil**  
Suani Teixeira Coelho, Sandra M. A. dos Santos and Beatriz Aquaro Lora, Brazilian Reference Center on Biomass – CENBIO, Eletrotechnical and Energy Institute of University of São Paulo & Sílvia M. S. G. Velázquez, Brazilian Reference Center on Biomass – CENBIO, Universidade Presbiteriana Mackenzie, Brazil
- 6.4 Equilibrium Simulation of a Small-Scale Gasification Biomass CHP Plant**  
P. Baggio, M. Baratieri and M. Grigante, Department of Environmental and Civil Engineering, University of Trento, Italy
- 7. Chemical Conversion Technologies**
- 7.1 A practical approach towards energy conversion through bio-refining of mixed kraft pulps**  
Dharm Dutt, J. S. Upadhyaya and Chandrahas Tyagi, Indian Institute of Technology Roorkee, India
- 7.2 Bioethanol from Different Finnish Agricultural Carbon Sources**  
Helena Kautola, Maritta Kymäläinen, Laura Tokeensuu and Tero Alatalo, HAMK University of Applied Sciences, Finland & Paola Cárdenas, Universidad Central del Ecuador, Facultad Ciencias Químicas, Ecuador & Kaarlo Siukola and Jyrki Näsi, Suomen Biojalostus Oy, Finland
- 7.3 Biofixation of Carbon Dioxide from Thermoelectric Plant Emissions by Controlled Microalgae Photosynthesis**  
Sanda Velea, Serban Sever, Daniela Stilpeanu and Emil Stepan, Research & Development National Institute Of Chemistry And Petrochemistry –Icechim & Nicolae Dragos, Biological Research Institute – ICB Cluj-Napoca, Romania
- 7.4 Biogas Proceeding From Sanitary Landfill for Energy Generation**  
Fernando Castro de Abreu, Vanessa Pecora and Suani Teixeira Coelho, USP – University of Sao Paulo, IEE/CENBIO – Electrotechnical and Energy Institute / Brazilian National Biomass Reference Center & Sílvia Maria Stortini González Velázquez, Universidade Presbiteriana Mackenzie, Brasil

- 7.5 Biogas Plant for the Local Area in Armenia**  
E. Kazarian, A. Nazaryan, and H. Karamyan, State Engineering University of Armenia, Armenia
- 7.6 Biopulping of Lignocarbonydrates Residues of Cymbopogon Martini with Phanerochaete Chrysosporium: An Approach Towards Energy Conservation and Waste Utilization**  
Chandras Tyagi, Dharm Dutt and J. S. Upadhyaya, Indian Institute of Technology Roorkee, India
- 7.7 Combined Biogas and Thermal Plant**  
E. Kazarian and H. Karamyan, State Engineering University of Armenia, Armenia
- 7.8 Comprehensive Evaluation of Engine Performance with Diesel and Biodiesel Fuel Blends**  
Ghobadian, B. and Najafi, G., Mechanical Engineering Tarbiat Modares University & Rahimi, H. and Khatamifar, M., ME Mechanical Engineering, Mega Motor Company, Iran
- 7.9 Evaluation of Copper Chromite and Char as Catalysts in Fast Pyrolysis of Biomass**  
Adisak Pattiya, James Titiloye and A V Bridgwater, Bio-Energy Research Group, Chemical Engineering and Applied Chemistry, SEAS, Aston University, United Kingdom
- 7.10 Experimental and Feasibility Study of Bioethanol Production from Reed Canary Grass**  
Laura Kupiainen, Jani Kangas and Juha Tanskanen, University of Oulu & Jouko Mannonen, Pyhäjärven Kehitys Oy, Finland
- 7.11 Fermentation from the Biomass into Basis of Electric Osmosis**  
E. Kazarian, A. Nazaryan and H. Karamyan, State Engineering University of Armenia, Armenia
- 7.12 Gasification of Straw pellets - Operation of a Staged Gasification with Controlled Slagging and Energy Introduction with a Plasma Injector**  
Michael Rumpl, Kai Schulze, Markus Kleinhapfl and Christian Roschitz, Austrian Bioenergy Centre GmbH & Hermann Hofbauer, Vienna University of Technology & Werner Kepplinger, Leoben University of Mining and Materials, Austria
- 7.13 Green Fleet Procurement Models - Procura –Project**  
Menno Chang, Ecofys b.v. & Marieke Reijalt, Federazione delle associazioni scientifiche e tecniche, The Netherlands
- 7.14 In-Situ Reforming of Tar from the Rapid Pyrolysis of Biomass over Meso/Microporous Carbon**  
Sou Hosokai, Koyo Norinaga And Jun-Ichiro Hayashi, Center for advanced research of energy conversion materials, Hokkaido university, Japan
- 7.15 Investigation of the Large Wood Particles Devolatilization Process Kinetics**  
Petar M. Gvero, University of Banja Luka, Faculty of Mechanical Engineering, Bosnia and Herzegovina & Milan R. Radovanovic and Simeon N. Oka, Vinča Institute of Nuclear Sciences, Laboratory for Thermal Engineering and Energy, Serbia & Mladen S. Ilic, Energy Saving Group, Serbia
- 7.16 Progress in Biodiesel and Bioethanol Production in Ukraine**  
Tetyana Zhelyezna and Georgiy Geletukha, Institute of Engineering Thermophysics NASU and SEC "Biomass", Ukraine
- 7.17 Recovery of Condensates from the Thermal Wood Refinement Extraction of Biomolecules**  
Christian Roschitz, Stefan Martiniand, Markus Kleinhapfl, Austrian Bioenergy Centre GmbH & Oliver A. Wrulich, Angela Wondrak and Florian Überall, Innsbruck University of Medicine, & Josef Draxler, Leoben University of Mining and Materials, Austria
- 7.18 Slow Pyrolysis: Australian Demonstration Plant Successful on Multi-Feedstock's**  
Adriana Downie, Peter Klatt, Robert Downie and Stephen Joseph, BEST Energies Australia, Australia.
- 7.19 Slow Pyrolysis of Cotton Stalks**  
M. Hakkı Alma, Kahramanmaraş Sutcu Imam University, Turkey & Ulrik Henriksen and Einar Bjørn Qvale, Denmark Technical University, Denmark
- 7.20 Steam Reforming of Biomass in a Fluidized-bed of Mesoporous Alumina Particles**  
Makiyo Sugawa, Sou Hosokai, Koyo Norinaga And Jun-Ichiro Hayashi, Center For Advanced Research Of Energy Conversion Materials, Hokkaido University, Japan
- 7.21 Substitution of Fossil Carbon in Metallurgy - Process Approaches for Biomass Introduction via Gasification**  
Markus Kleinhapfl, Christian Roschitz, Werner Stutterecker, Austrian Bioenergy Centre GmbH & Werner Kepplinger, Leoben University of Mining and Materials & Hermann Hofbauer, Vienna University of Technology, Austria
- 8. Solid Conversion**
- 9. National and Areal Demonstration and Market Implementations of Bioenergy Production and Use in different Bioenergy Sectors**
- 9.1 Häme Bioethanol and Biogasification Plant**  
Maritta Kymäläinen, Venla Laine and Helena Kautola, Häme University of Applied Sciences & Kaarlo Siukola and Jyrki Näsi, Suomen Biojalostus Oy & Harri Enwald, Insinööritoimisto Valcon Oy, Finland
- 9.2 Renewable Fuels and Renewable Energy in a Flight Training Academy: A Model of Sustainability in Aviation**  
M.G. Zanin and M.E. Shauck, Baylor Institute Of Air Science, Baylor University, Usa
- 9.3 Synthetic Natural Gas (SNG): From Small-Scale Demonstration to Large Scale Implementation**  
R. Zwart and A. van der Drift, Energy research Centre of the Netherlands, The Netherlands
- 10. Environmental Issues**
- 10.1 Dry Gas Cleaning System for Multiple Impurities Removal in Biomass Derived Fuel Gas**  
Makoto Nunokawa, Makoto Kobayashi, Hiroyuki Akiho, Akimasa Yamaguchi and Yoshihisa Tochiyama, Central Research Institute Of Electric Power Industry (Criepei), Japan
- 10.2 Environmental and Societal Implications of Burning Surplus Cereal Straw Instead of Lignite Coal in Saskatchewan Electric Power Generation**  
Alfred Wong, Arbokem Inc., Canada
- 10.3 Environmental Impact Assessment of Fiber Sorghum (Sudan-Grass) Production Systems for Biomass Energy Production in a Central Region of Italy**  
Cinzia Buratti, Francesco Fantozzi and Marco Barbanera, Biomass Research Centre, University of Perugia, Italy
- 10.4 Influence of Co Presence in No Reduction by Acetylene Soot**  
T. Mendiara, M.U. Alzueta, A. Millera and R. Bilbao, Aragón Institute of Engineering Research, Spain
- 10.5 Lifecycle Assessment of Biofuel from Wood Waste Pyrolysis Project in Tanzania**  
Samwel V. Manyele, University of Dar es Salaam, Tanzania
- 10.6 Utilisation of Bio Fly Ash as a Mulch**  
Hanne Soininen and Hannu Kuopanportti, YTI Research Centre, Mikkeli Polytechnic & Pirjo Kivijärvi, MTT Agrifood Research Finland, Finland

# Technical Tours September 3<sup>rd</sup> and 6<sup>th</sup>

## Pre-Tour September 3<sup>rd</sup>

From City of Helsinki at 11.30 am via Helsinki Airport to Conference city Jyväskylä at 19 pm, travel 320 km.

### Neste Oil's Brand-new Biodiesel plant

The first stop will be Company Neste Oil's production plants near city Porvoo, 40 km. Total oil production capacity is 11 million tonnes per year and biodiesel capacity 170 000 t/a. This new plant will start up in summer 2007.

Synthetic NExBTL biodiesel will be the world's first second-generation biodiesel to be launched commercially. Company has decided to build a second plant to produce premium-quality biodiesel, scheduled to begin production towards the end of 2008. The second plant will have the same capacity as the first one. In addition to the oil and biodiesel refinery, the Porvoo refinery comprises a large container area, harbour and technology centre.

### Kymijärvi Biomass Gasifier

The Kymijärvi power plant is a traditional pulverised coal fired power plant. The electricity production capacity is 200 MW and district heat capacity 250 MW.

Power plant concept consisting of a gasifier coupled to a coal fired boiler offers an attractive way to use biomass in Europe.

In the Kymijärvi concept, an atmospheric CFB-gasifier is connected to the existing coal fired boiler. In the gasification reactor the fuel is converted to a gas with air. A cyclone separates circulating bed material back to the gasification zone. The produced gas is used in gas burners located in the main boiler. The used gas accounts to 350 GWh. The coal represents 1700 GWh. In addition, 150 GWh natural gas is used. The biomass gasifier accounts for 15-20 % of the fuel input. The fuels for the gasifier are different kinds of wood based fuels and SRF (Solid Recovered Fuel, Municipal waste derived fuel). In a planning phase is a new gasifier with a capacity of 220 MW.

### Haapasuo Peatland

Peat, a slow growing renewable biofuels accounts for about 6 - 7 % of Finnish primary bioenergy consumption and also electricity. Haapasuo peatland is one of the biggest, about 2000 hectare, in south Finland. Half of the bog is used for fuel peat production. Here you can see the modern peat production and fuel terminals, where also other biofuels are stored and delivered to power plants as different mixtures. Part of the used peat production area is used for reed canary grass plantation for energy.

The other part of the bog is a natural preserved area and there is a lot of different bird land on this bog. From the Haapatower you will get an overview of the whole peatland.

## Tour I September 6<sup>th</sup>

### New Technologies for Large Scale Production of Forest Fuels for CHP

From 8.00 am to 17 pm, travel 150 km

Tour is mainly organized by UPM-Kymmene Company. UPM is one of the biggest paper producer in the world and it uses a lot of different kind of biofuels. Finnish forest machine manufacturers have developed new methods for large scale forest energy procurement; Logging residues, stump- and small tree harvesting.

Tour will concentrate on the latest developments concerning all these forest energy sources.

### Forest sites

The following large scale production methods are presented at the forest sites:

#### Final felling site

Pulp- and sawlog harvesting, forest residue bundling and transportation, stump lifting and transportation, co-planting with cultivation machine and large-scale chipping at the roadside..

#### Thinning site

Mechanized multi tree handling with felling heads, combined undelimited pulp- and energywood harvesting and transportation to the roadside.

### Jämsänkoski CHP Plant

Jämsänkoski CHP Powerplant (185 MWth / 46 MWe) is one of UPM:s large power plants in central Finland using biofuels. Bark from the papermill, peat, stumps and logging residues from final fellings and small stems and residues from early thinnings are the main fuels in the fuel mix. We will see the powerplant and large scale peat, stump- and forest residue handling and measurement at the power plants receiving station.



# Technical Tours September 6<sup>th</sup>

## Tour 2

### Biogas and small-scale CHP

From 9.00 am to 5 pm, travel 230 km



#### University of Jyväskylä

Department of Environmental Science, University of Jyväskylä is a multi-disciplinary research-led institute with over 20 years of experience in anaerobic/biogas processes. Current research topics are biogas and bio-hydrogen production from organic wastes and energy crops and biogas upgrading to vehicle fuel quality. We will visit the University field test site with a pilot plant for biogas production and a landfill gas upgrading unit. We will also have a tour of the local waste treatment facility Mustankorkea Ltd., where biowaste is composted in a tunnel composter, and landfill gas is collected and combusted for feeding the heat to a network.

#### Kalmari biogas farm

Kalmari farm is one of the pioneer farms for producing biogas in Finland, and an exceptional example of a diverse use of biogas technology. The farm is self-sufficient in electricity, heat and vehicle fuel. Excess electricity is sold to grid, and biogas upgraded to vehicle fuel quality has been sold to customer since 2006. Biogas plant was built and CHP production started in 1998, and biogas has been upgraded to vehicle fuel since 2002. Biogas plant digests cow manure, industrial bio-waste and energy crops. Bio-fertiliser produced is used on the farm's own cropland.

#### Institute of Natural Resources, Jyväskylä University of Applied Sciences

The Institute of Natural Resources is an educational unit of Jyväskylä University of Applied Sciences within the field of natural resources, located in Saarijärvi in the northern part of Central Finland. The aim of the institute is to generate new innovative business activities particularly in the bioenergy and food branches. The unit has field test facilities for biogas and biodiesel production and small-scale CHP.

#### Puulaakson Energia Ltd. CHP-plant, Karstula

The wood fuelled CHP plant in Karstula was put in operation in year 2000. The CHP plant is fuelled by wood residues from the adjacent log-house factory Honkarakenne Ltd. The owner of the CHP plant is a company called Puulaakson Energia Ltd. The plant has a thermal capacity of 10 MWth and it produces heat for the municipal district heating network and steam and heat for the Honkarakenne Ltd. In addition the plant produces 1 MWel of electricity used at Honkarakenne Ltd.

## Tour 3

### R&D&D: New biomass production and combustion technologies, research and demonstrations, R&D for Renewables

From 8.30 am to 16 pm, travel 20 km

#### Bioenergy development in Central Finland, BENET - Bioenergy Network

In this tour we will meet the real bioenergy developers and promoters. Central Finland region is the highest developed bioenergy market area in Finland. It has long traditions of industrial and municipal use of biofuels in electricity and heat production. Today, the utilization rate is 70% of the energy production (traffic excl.). Central Finland is in the top of Finland with 50 % of biomass in the energy balance. Market breakthrough of wood chips was made over ten years ago by intensive



development work and co-operation between market actors and authorities. Today the target is to convert nearly all fossil oil by renewables until 2015. In Central Finland there are plenty of world-wide-known bioenergy players. The co-operation is organized through the BENET - Bioenergy Network.

**Vapo Group**

Vapo Local Fuels meets the growing demand for local biofuels. It is the largest supplier of biofuels in the Baltic Sea area and the world's largest peat producer. Vapo Pellets is the leading pellet supplier in Europe. It is the market leader in the Nordic consumer market and a significant basic supplier to European power plants. Vapo Heat and Power offers its customers heat and power produced with local biofuels in Finland and in the Baltic Sea region. Vapo Environment provides its customers with solutions for environmental challenges with high-standard environmental peat, soil products and waste treatment services.

The sub-groups are Vapo Timber Oy, which ranks among the largest sawmill industry companies in Europe. Kekkilä Oyj offers its customers growing media for home, garden and landscape and supplies greenhouse cultivators with high-quality products.

The study tour will visit Vapo's head office in Jyväskylä. It gives an extraordinary possibility to meet some persons behind the company today and hear about Vapo's bioenergy business and also visions for the future.

**Rauhalampi CHP Plant**

The Rauhalampi Plant, commissioned in 1986 and retrofitted in 1995, represents the state of art technology with respect to the use of indigenous fuels, peat, wood and wood wastes. It is also internationally known for its high availability and environmentally reliable systems.

The Rauhalampi Plant is the main supplier of heat in the district heating net in the city of Jyväskylä and surrounding areas. The output for district heat is 140 MW<sub>th</sub>. Electricity output to the national net is 87 MW<sub>e</sub>. The plant also supplies the nearby "urban paper mill" the necessary process steam, annually about 350 GW (max steam output 65 MW<sub>th</sub>). In addition the cogeneration of heat and electricity enables the energy contained in the fuel to be used to full advantage, and the plant efficiency is thus high. The boiler in this unit is a bubbling fluidised bed boiler that was the world's largest of its type, using biofuels, when erected in 1995. In the study tour we concentrate on the fuel reception and quality questions and also fuel crushing and handling in the plant.

**VTT**

VTT Processes is one of the largest and best-known European research and development units in the field of bioenergy, especially in forest biomass-based expertise, and developing also distributed energy concepts. VTT's activities cover the whole bioenergy



chain from harvesting and handling of biomass-based fuels to energy production technologies and end-use. VTT with its expertise on bioenergy is in a key position in the development of new technology needed to achieve this goal in co-operation with industry and other stakeholders. Finnish bioenergy technology is well-known globally especially for recovery and utility boilers utilised in forest industry. Advanced combined heat and power production and residential heating are areas of extensive growth. The VTT bioenergy facilities close to Rauhalampi CHP plant give the visitor an outlook to the use of modern technology in developing the renewable energy systems.

**University of Jyväskylä, Science campus**

Special features of the faculty of Mathematics and Sciences include two new study and research programs: nanosciences and renewable energy program. Both have their own research environments, the former state of art nanolaboratories including clean room space, the latter the experimental laboratory at Vaajakoski a site for solar heat and micro-scale CHP research. Also presentation of the laboratory for anaerobic biogas production research at the department of biology and environmental sciences may be organized. Site visits may be organized according to the interest of the participants.

**FINBIO – The Bioenergy Association of Finland**

FINBIO is the main association in bioenergy field in Finland and represents all bioenergy sector (wood-based fuels, recovered biofuels, peat, agrofuels, biogas and bioliquers). FINBIO effects on energy policy and promotes the commercial use of bioenergy. It has over 100 member organisations from energy and forest industry companies to manufacturers and R&D-houses.

# Accommodation

The organisers have made preliminary reservations from a number of hotels. Special rates have been negotiated for the conference participants for reservations made through Jyväskylä Events Ltd, our local accommodation office. The Conference hotels are listed at the conference website under heading accommodation and on the accommodation booking form. If you wish to receive more detailed accommodation information please contact Jyväskylä Events Ltd by fax +358 20 748 1829 or by e-mail: bioenergy07@congreszon.fi.



## Hotel Cumulus Jyväskylä

[www.restel.fi](http://www.restel.fi)

- situated in Jyväskylä town center
- 202 rooms, 2 restaurants, 2 saunas, 5 conference premises
- 20 km to the airport  
50 m to the railway station  
50 m to the bus station  
200 m to the Jyväskylä Paviljonki

Price: Single 125 € / room / night  
Double 150 € / room / night

## Hotel Rantasipi Laajavuori

[www.restel.fi](http://www.restel.fi)

- situated 4 km from the Jyväskylä town center close to nature
- 196 rooms, 2 restaurants, 5 saunas, 19 conference premises
- 18 km to the airport  
4 km to the railway station  
4 km to the bus station  
4 km to the Jyväskylä Paviljonki

Price: Single 125 € / room / night  
Double 150 € / room / night

## Hotel Scandic Jyväskylä

[www.scandic-hotels.com](http://www.scandic-hotels.com)

- situated in Jyväskylä town center
- 150 rooms, 2 restaurants, 1 sauna, 5 conference premises
- 20 km to the airport  
100 m to the railway station  
100 m to the bus station  
250 m to the Jyväskylä Paviljonki

Price: Single 130 € / room / night  
Double 150 € / room / night

## Sokos Hotel Alexandra

[www.sokoshotels.fi](http://www.sokoshotels.fi)

- Situated in Jyväskylä town center
- 274 rooms, 3 restaurants, 2 saunas, 13 conference premises
- 20 km to the airport  
50 m to the railway station  
50 m to the bus station  
200 m to the Jyväskylä Paviljonki

Price: Single 125 € / room / night  
Double 146 € / room / night

## Sokos Hotel Jyväskylä

[www.sokoshotels.fi](http://www.sokoshotels.fi)

- situated in Jyväskylä town center by a pedestrian street
- 129 rooms, 4 restaurants, 3 saunas, 5 conference premises
- 20 km to the airport  
300 m to the railway station  
300 m to the bus station  
450 m to the Jyväskylä Paviljonki

Price: Single 125 € / room / night  
Double 146 € / room / night

## Finlandia Hotel Alba

[www.hotellialba.fi](http://www.hotellialba.fi)

- situated 1 km from the Jyväskylä town center by the lake
- 126 rooms, 1 restaurant, 1 sauna, 2 conference premises
- 21 km to the airport  
1 km to the railway station  
1 km to the bus station  
1 km to the Jyväskylä Paviljonki

Price: Single 82 € / room / night  
Double 104 € / room / night

# Registration Form

Last name: \_\_\_\_\_

First name: \_\_\_\_\_

Organisation: \_\_\_\_\_

Address: \_\_\_\_\_

Postal code: \_\_\_\_\_ City: \_\_\_\_\_

Country: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

## Registration and payment

	Before June 30	After June 30	Payment
● For members of FINBIO	450 €	520 €	_____
● For non-members	520 €	600 €	_____
● Student	150 €	150 €	_____
● Conference Dinner	60 €	60 €	_____
● Pre-conference Tour	100 €	100 €	_____
● Technical Tour 1	120 €	120 €	_____
● Technical Tour 2	120 €	120 €	_____
● Technical Tour 3	60 €	60 €	_____
	<b>TOTAL EURO</b>		_____

All Prices including VAT 22 %.

I will participate to the Reception 3<sup>rd</sup> September

## Payment

transferred to FINBIO, Sampo Bank plc. Helsinki, Finland.

Account number 800011-70312087, SWIFT code PSPBFIHH, IBAN: FI9680001170312087

by credit card

Visa  Mastercard  Eurocard  American Express

Card holder: \_\_\_\_\_

Card number: \_\_\_\_\_

Expire date: \_\_\_\_\_ CW \_\_\_\_\_

Card holder's signature

## Return this form

- by fax +358-207 639 609
- by mail FINBIO, Vapaudenkatu 12, FI-40100 Jyväskylä, Finland
- by e-mail [bioenergy2007@finbio.fi](mailto:bioenergy2007@finbio.fi)
- by internet [www.finbioenergy.fi/bioenergy2007](http://www.finbioenergy.fi/bioenergy2007)

## Conference Programme

Prof. Dan Asplund, Vice-President of Aebiom  
Tel. +358 - 207 639 603  
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e-mail: bioenergy2007@finbio.fi

Mr. Pekka-Juhani Kuitto, Executive Director of FINBIO  
Tel. +358 - 207 639 601  
Fax +358 - 207 639 609  
e-mail: bioenergy2007@finbio.fi

## Exhibition Information

Jyväskylä Fair Ltd is the official organizer of the Exhibition of Bioenergy 2007. The exhibition will be held in the Jyväskylä Fair Centre – Jyväskylä Paviljonki.

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## Organised



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[www.finbioenergy.fi/bioenergy2007](http://www.finbioenergy.fi/bioenergy2007)

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