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Solutions for biomass fuel market barriers and raw material availability - IEE/07/777/SI2.499477

EUBIONET III Workshop - Bioenergy for Industry: Minutes

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Brussels, 12 March 2009

Intelligent Energy Europe

Content

Executive summary and recommendations 3

Preface 5

1 Introduction and welcome by Mr. Jean-Marc Jossart, AEBIOM 6

1.1 Objectives of this workshop 6

1.2 Current biomass use in Europe 6

2 Short introduction to the objectives of this workshop by Dr. Martin Junginger, University of Utrecht 7

3 The renewables directive and opportunities for industries by Mr. Jeremy Wall, DG Enterprise & Industry 7

4 State of biomass trade and barriers to overcome by Dr. Martin Junginger, University of Utrecht 8

5 Towards international solid biofuel standards by Ms. Eija Alakangas, VTT 9

6 Constraints of official external trade statistics and the Combined nomenclature in the field of bioenergy by Mr. Jussi Ala-Kihniä, Eurostat 10

6.1 Discussions 11

7 Overview of biomass in cement industry by Mr. Vagner Maringolo, CEMBUREAU 11

8 Co-processing of biomass within Heidelberg Cement: Practical examples by Mr. Bernard Mathieu 11

8.1 Discussions 13

9 Ecoson: Better alternative fuels by Mr. Koert Ackerman 13

9.1 Discussions 14

10 Use of biomass for energy in the Dutch Food and Grocery sector: an overview by Mr. Paul Alfing, FNLI 14

11 Second discussion round, chaired by Mr. Jean-Marc Jossart 15

11.1 Expectations, challenges, threats faced by the industry 15

11.2 Where do we need more regulations, or less? 16

11.3 What would the industry need? More/ better statistics, potential assessments, price data? 17

11.4 Conclusions by Mr. Jean-Marc Jossart 17

11.5 Final announcements 18

Appendix 1 – Participant list 19

Executive summary and recommendations

Objective of this workshop was to get a state of the art overview regarding biomass trade and its related standardization issues; to bring together stakeholders of the new industrial sectors which possibly could use biomass for energy. By new industrial users we mean such sectors, which so far have not been so much involved in bioenergy projects. These sectors will be identified during the project, but could include for example metal and construction material industries, etc. Our objective was also to obtain insights in current uses (including best practices), barriers to further utilization in the European Union, and the importance of biomass trade; to learn about success stories from market actors in these new industries that utilize biomass for energy. The aim was also to get an overview why new industries are aspiring to increase bioenergy utilization and which difficulties they face in practise. Likewise, if industries choose not to utilize biomass as an energy source, we would like to hear what are the main reasons for doing so. Biomass trade was especially highlighted, as large amounts of biomass are often not available at the place of demand, and thus trade may play a pivotal role in increasing bioenergy use.

Industrial players actively involved in biomass utilization and trade, and representatives from academia and NGOs following the (consequences of) increasing biomass utilization and trade were invited to participate in this workshop. Below, a number of point and lessons are summarized:

There are clearly opportunities for biomass use in "new industries". Currently, mainly waste-streams are used (tyres, sewage sludge, animal meal, fats). Both the cement and food-processing industries (the main industries present at the workshop) have ambitions to further increase their utilization of biomass for energy. However, during the presentations and ensuing discussions, a number of points were raised which currently hamper the increased use of biomass:

The economic recession is currently causing major barriers for additional biomass utilization

One of the industries invited to this workshop was the metal industry. While the initial response was positive, unfortunately they were not able to participate in this workshop. Some representatives of steel industry have expressed their interest to utilize biomass to reduce CO_2 emissions. However, due tot the recent global financial and economic crisis, currently the industry is mainly concerned about its bare survival, and any additional investments are on hold for the time being.

Local biomass streams are often already efficiently utilized and competition for feedstocks with other industries is frequently occuring

As presentation from basically all industry representatives illustrated, biomass residue and waste streams are often already utilized, either for energy purposes, or for other end-uses, such as food for human consumption, animal fodder or for the construction industry. Thus, utilization of biomass for energy or other purposes is often decided on a day-to-day basis, depending on amongst others the price of fossil energy but also the price of fodder. Exceptions are waste streams such as sewage sludge or bone meal. The former is very wet (and requires drying) and has relatively high ash contents, making them more suitable for the cement industry. Bone meal is legally required to be burned at high temperatures, thus this feedstock is readily available for the cement industry.

(International) biomass trade of refined biofuels is less relevant for ‘new’ industries

Most 'new' industries use local biomass streams, often with high moisture content. The cost of biomass may be typically a crucial factor, preventing the use of refined biomass fuels (such as wood pellets or briquettes, vegetable oils or biogas). Also, the high moisture content makes transport over larger distances impossible (because of high costs and energy consumption). An extreme example of this is sewage sludge, which in its original state contains 2% solid matter, and thus need to be (pre)dried locally. On the other hand, some industries may actually be paid for processing a biomass fuel/waste because of the gate fees (for landfilling). In these cases it is more attractive for the waste producer to pay for biomass treatment (combustion, gasification, anaerobic digestion etc.) than to pay gate fee for landfilling.

Utilization and trade statistics are hard to come by

Currently there is no reliable data on how much biomass is traded in the market, and what is the actual technical potential of biomass. Also, biomass is often traded bilaterally, so markets are not transparent. One workshop participant remarked that a platform is required for users and producers, traders, suppliers, waste producers etc to meet and exchange information.

Legislation and public opinions are factors not to underestimate

A major problem for increased utilization of biomass especially in the food-processing industry is that the public opinion has become somewhat negative because of the "food vs. fuel" discussion, which has also impact on governmental actions.

The sector calls for more logic and rationalities behind the policies to favour:

- Proximity in using biomass
- Efficiency of conversion
- Schemes should favour first best economic viability routes
- Less protectionism
- More level playing field for CO_2 and for electricity support schemes

Some recommendations were highlighted

- More statistics on the biomass availability/potential, including waste
- Platform of biomass suppliers and users
- Support to demonstration projects of new technologies
- Innovative system like swap (flexibility in location of the projects)
- Improve communication to make biomass more reliable regarding fuel supply.

Preface

This publication is part of the EUBIONET III Project (Solutions for biomass fuel market barriers and raw material availability - IEE/07/777/SI2.499477, www.eubionet.net) funded by the European Union's Intelligent Energy Programme.

EUBIONETII is coordinated by VTT and other partners are Danish Technological Institute, DTI (Denmark), Energy Centre Bratislava, ECB (Slovakia), Ekodoma (Latvia), Fachagentur Nachwachsende Rohstoffe e.V., FNR (Germany), Swedish University of Agricultural Sciences, SLU (Sweden), Brno University of Technology,UPEI VUT (Czech), Norwegian University of Life Sciences, UMB (Norway), Centre Wallon de Recherches Agronomiques, CRA-W (Belgium), BLT-HBLuFA Francisco Josephinum, FJ-BLT (Austria), European Biomass Association, AEBIOM (Belgium), Centre for Renewable Energy Sources, CRES (Greece), Utrecht University, UU (Netherlands), University of Florence, UNIFI (Italy), Lithuanian Energy Institute, LEI (Lithuania), Imperial College of Science, Imperial (UK), Centro da Biomassa para la Energia, CBE (Portugal), Energy Restructuring Agency, ApE (Slovenia), Andalusian Energy Agency, AAE (Spain). EUBIONET III project will run 2008 – 2011.

The main objective of the project is to increase the use of biomass based fuels in the EU by finding ways to overcome the market barriers. The purpose is to promote international trade of biomass fuels to help demand and supply meet each other, while at the same time the availability of industrial raw material is to be secured at reasonable price. The EUBIONET III project will in the long run boost sustainable, transparent international biomass fuel trade, secure the most cost efficient and value-adding use of biomass for energy and industry, boost the investments on best practice technologies and new services on biomass heat sector and enhance sustainable and fair international trade of biomass fuels.

This report covers the discussions and main ideas presented at the workshop "Bioenergy for Industry" organised in Brussels on March 12, 2009. Objective of this workshop was to get a state of the art overview regarding biomass trade and its related standardization issues; to bring together stakeholders of these new industries to obtain insights in current uses (including best practices), barriers to further utilization in the European Union, and the importance of biomass trade; to learn about success stories from market actors in these new industries that utilize biomass for energy. Also our aim was to get an overview why new industries are aspiring to increase bioenergy utilization and which difficulties they face in practise. Likewise, if industries choose not to utilize biomass as an energy source, we would like to hear what are the main reasons for doing so. Biomass trade was especially highlighted, as large amounts of biomass are often not available at the place of demand, and thus trade may play a pivotal role in increasing bioenergy use.

Industrial players actively involved in biomass utilization and trade, and representatives from academia and NGOs following the (consequences of) increasing biomass utilization and trade were invited to participate in this workshop.

Authors, Brussels, March 12, 2009

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1 Introduction and welcome by Mr. Jean-Marc Jossart, AEBIOM

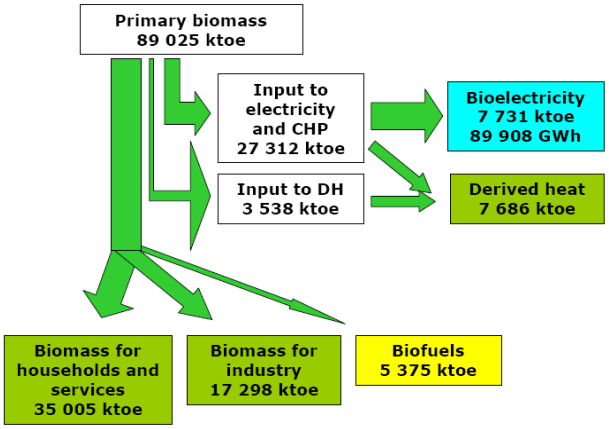
1.1 Objectives of this workshop

Objective of this workshop is to get a state of the art overview regarding biomass trade and its related standardization issues; to bring together stakeholders of these new industries to obtain insights in current uses (including best practices), barriers to further utilization in the European Union, and the importance of biomass trade; to learn about success stories from market actors in these new industries that utilize biomass for energy. Also our aim is to get an overview why new industries are aspiring to increase bioenergy utilization and which difficulties they face in practise.

Mr. Jean-Marc Jossart, AEBIOM. Picture: Peter Rechberger, AEBIOM.

1.2 Current biomass use in Europe

Bioenergy in 2006 (Eurostat)



Bioenergy balance in Europe, 2006.

For biomass use there are currently two policy levels: the European level covered by the Renewables Directive, and the national level covered by the National Action Plans. The deadline for finalising the National action plans is June 2010. Each member country has its own targets and own measures to support the Renewables Directive.

Currently 2/3 of renewables is biomass. Sustainability of biomass is a hot issue. Industries are a bit nervous on the competitive situation on raw materials which can both be used by industry for materials and as fuel for energy production.

2 Short introduction to the objectives of this workshop by Dr. Martin Junginger, University of Utrecht

Martin Junginger presented the scope and aims of the workshop. The main target is to reach the new industrial bioenergy users. EUBIONET III wants to learn how and to what extend the new industries are using biomass, how the use could be increased, and what are the barriers to increase the use?

We also wish to hear about the success stories, and what difficulties the industries are facing currently. The economical crisis also affects the plans of the industry on using more biomass.

The presentations are available on EUBIONET web-site at http://www.eubionet.net/

A follow-up of this workshop is going to be organised in Hamburg within the 17th European Biomass Conference in Hamburg, most likely on July 1st or July 2nd. For more information, see http://www.conference-biomass.com/index.htm

3 The renewables directive and opportunities for industries by Mr. Jeremy Wall, DG Enterprise & Industry

EU sees the importance of the EU Renewable Energy Directive in helping to meet the commitments related to lower GHG emissions, to secure the energy supply from various sources and from different regions, and of course securing jobs and economic development particularly in rural areas.

Mr. Jeremy Wall, DG Enterprise & Industry. Picture: Peter Rechberger, AEBIOM.

It is expected that the directive will be adopted in March 2009.

In order to meet the 20-20-20 target, each member state has its own targets presented in the National Renewable Energy Action Plans. It is not only about the final targets, but also how to get there, has to be planned clearly.

Biomass has got a big role in reaching the goals because there are big potentials in this area.

For industry there are important challenges and opportunities:

For example subsidies: If done in a wrong way they may take away the raw material from the industry raw material use.

On the other hand this should create new markets for fuel and by-product producers. When it comes to bio-refineries: a whole range of materials, including biofuels, and chemical feed-stocks, product selection may be much wider than currently.

Bioenergy/renewables sector needs new financing opportunities.

4 State of biomass trade and barriers to overcome by Dr. Martin Junginger, University of Utrecht

Martin Junginger gave a quick review on global bioenergy trade today, focussing on wood pellets, bioethanol and biodiesel, briefly highlighting the main barriers that currently hamper bioenergy trade.

Wood pellet trade has increased substantially recently, and it is expected to grow even more. In the US and Canada, there is a tremendous progress in the pellet market as large amounts of wood originally grown for timber are used for other markets and pellet-megaplants are currently being built in the USA. As in many

European countries raw material for pellets is running out (saw dust), wood pellet imports from Canada and recently USA towards the EU are increasing.

Mr. Martin Junginger, University of Utrect. Picture: Peter Rechberger, AEBIOM.

Also the trade of ethanol has increased tremendously.

Biodiesel production capacity is growing rapidly. In 2007, already production capacity had been built that could utilize about 10% of the global vegetable oil production for biodiesel production. Biodiesel demand is largely in Europe.

IEA Bioenergy Task 40 is currently working on trade barriers (see slides). There are a number of possible barriers (tariff barriers, technical barriers, logistics etc.). In the short term we see that sustainability criteria may impede the trade of biomass, especially as currently many different certification systems are being developed.

5 Towards international solid biofuel standards by Ms. Eija Alakangas, VTT

The European standardisation organisation, CEN has published 27 technical specifications (pre-standards). It takes about 10 years to get the standards to be applied in the market.

When a technical specification is published, there is a testing period of 3 years. The upgrading of the solid biofuel technical specification to full European standard (EN-standard) is on-going. One barrier for the implementation was that national standards can be used concurrently while the technical specifications are not yet European standards. National standards have to be withdrawn when a country starts to implement European standards.

First part of the EN14961 covers general requirements for fuel specifications of solid biofuels. There are already several standards for the combustion equipment, it is important to finally have standards for fuels as well. Non-industrial use (households, small industrial and public buildings) will have own product standards for wood pellets and briquettes, wood chips, firewood/log wood and non-woody

pellets. The work for international standards for solid biofuels has also started under ISO (International standardisation organisation).

Classification is based in origin and source. Biomass is divided into 4 different groups in the prEN14961-1.

EUBIONET III promotes the use of solid biofuel standards and supports the standardisation of sustainability criteria for all biomass use.

6 Constraints of official external trade statistics and the Combined nomenclature in the field of bioenergy by Mr. Jussi Ala-Kihniä, Eurostat

Basis for our statistics is commodity classification. Harmonized system in used worldwide as customs classification. It also serves statistical needs. EU uses combined nomenclature (CN) codes.

CN for the following year is always published in the official journal of October.

Eurostat is now starting to get the first trade data on pellets from member states.

There are methodological constraints for publishing the trade data:

1) Extra-EU trade: confidentiality

2) Intra-EU trade: issue of exemption thresholds and confidentiality: This means that 97/95% (EXPORT/IMPORT) of total trade has to be collected which means that small traders can be exempted from reporting- these thresholds are set by member states yearly.

Classification is based on text on official journal, definitions/correctives are in the CN and classification regulations. Trade data is available for free.

Mr. Jussi Ala-Kihniä, Eurostat. Picture: Peter Rechberger, AEBIOM.

6.1 Discussions

(Q= question, C=comment, A=answer)

Q: Why the information on the origin of ethanol is not published?

A: (by Jussi Ala-Kihniä) Country of origin is collected, for example Finland publishes country of origin. However, Eurostat only publishes information on where the product comes from, not the origin.

Globalisation of markets has also drawbacks: unemployment, energy dependency etc.

C: sometimes it is cheaper to import for example pellets from very far away (like Canada, USA) than to use European produced pellets. The user buys from where they get it cheaper. Transport by ship keeps the costs low.

Q: what is the history of carbon footprint? Fairtrade chain? The carbon footprint depends also on the material traded, and transport distances.

Q: The greatest barrier that customers are facing is how to ensure reliable access to biomass. How to get easy access to biomass?

A: (by Eija Alakangas) in Finland plants are designed for multi-fuel use. They have very long supply contacts for fuel supplier. Plants have many suppliers (big plants may have even 50 suppliers). There is need to establish reliable fuel supply chains and infrastructure. This has solved problem related to insecurity of supply.

7 Overview of biomass in cement industry by Mr. Vagner Maringolo, CEMBUREAU

Energy is important for cement industry. It is a raw material, energy and CO_2 intensive industry. Production of 1 ton of cement requires 60-130 kg fuel oil, and 90-120 kWh electricity.

5% of global CO_2 emissions originate from cement industry. 60% of these CO2 emissions are released during the decarbonisation, an unavoidable production step. Energy efficiency has been improved significantly in the industry since 1960's.

Cement industry can not benefit from Renewable Energy directive as can the power companies.

The conditions in the cement kiln assure complete combustion because of high temperature and long residence time. Tyres, animal meal or sewage sludge can be safely burned in cement kiln.

The problem today is more of shortage of supply rather than regulatory. Long-term access to biomass resources have to be secured.

8 Co-processing of biomass within Heidelberg Cement: Practical examples by Mr. Bernard Mathieu

Heidelberg Cement is worldwide leader in the use of alternative fuels and raw material for clinker and cement production. Company uses sewage sludge, MBM, agricultural waste. HC is interest in "ethical biomass".

Cement kiln is the most sustainable option for sewage sludge energy application

HC's process is not only about burning, it is also about recovering minerals, for example Hg is captured effectively

600 000 tonnes of dewatered (dry) sewage sludge is used in Heidelberg plants world wide.

Mr. Bernard Mathieu, Heidelberg Cement. Picture: Peter Rechberger, AEBIOM.

Important components in flue gas (emissions to air) are monitored.

Public-private-partnership solution in Maastricht has resulted win-win situation for waste producer and cement producer. It is prohibited to dump sludge on landfill or use it as fertilizer.

120 000 tonnes of MBM (meat and bone meal) is used in company's Europe plants, most of that in Benelux countries

New solutions to improve energy efficiency have also been developed, for example:

- In China plant waste heat from flue gases were recovered for drying.
- Also from clinker cooler waste heat can be used for drying.

The company is looking for new innovative solutions to increase the use of renewable fuels/waste fuels.

Benefits of using biomass in cement production are three fold: Economic-Social-Environmental.

Difficulties:

1) Regulations are not mature enough in some countries to co-process waste in cement kilns.

2) Technical bottle neck is the control of P_2O_5 and Hg content.

8.1 Discussions

Some of the audience during the discussions. Picture: Peter Rechberger, AEBIOM.

Q: Are there legislative problems related to the use of MBM?

A: NO_x production from MBM use is mainly thermal NOx, MBM does not increase NOx emission.

A: (by Koert Ackerman) By law, MBM has to be burnt. Burning in cement kiln is an ideal solution.

C: (by Jean-Marc Jossart) For producing one unit of electricity compared to one unit of heat, fuel need is about 3 times higher. However the targets of the directive are related to the final energy consumption. It means that the target will be 3 times more effectively reached by using biomass for heat and co-processing compared to electricity.

C: Caloric heating value of sewage sludge is positive.

C: Waste heat using for drying of sewage sludge makes sense.

C: It is not always possible to use waste heat from flue gases, condensation point of too cool flue gas creates problems.

9 Ecoson: Better alternative fuels by Mr. Koert Ackerman

Ecoson is the biggest producer in Europe of animal meals and animal fats. Most material comes from own slaughter houses. It is locally produced, since it is not economical to transport long distances.

Market applications are many: CHP, transport sector, biodiesel, other biodiesel producers and fossil fuel producers and oleo.

Main problem is that the public opinion somewhat negative, also “food for fuel” discussion has got influence. Public opinion has got impact on governmental actions.

Today because of the prices of fossil fuels, it is not economically viable to produce biodiesel.

Problem is that long-term investments are troublesome if there is no guarantee on how long certain subsidies will be available. “Never underestimate the role of the public opinion”

9.1 Discussions

Q: European emission trading system? In case of renewable fuel trade, who will benefit from emission trading?

A: It is the user of the biomass, not the one who sells it.

Q: Second generation biodiesel. Break-even price compared to crude oil? When it would be economically viable to produce biodiesel?

A: (by Koert Ackerman) It is not only the crude price, but also other industries: how much they are willing to pay for the product (animal meal)

Q: Do you get paid for processing for the animal meal?

A: (by Koert Ackerman) Our company does nor process them. Only animal fat.

10 Use of biomass for energy in the Dutch Food and Grocery sector: an overview by Mr. Paul Alfing, FNLI

FNLi represents Food and Grocery industry in the Netherlands.

There are several success stories of biomass use in this industry: Like in-plant reuse of biomass (for example greenhouses using own residues)

There are special targets for agricultural sector in the Netherlands regarding energy: 2% energy saving per year, 30% reduction of GHG, and 20% of energy should be sustainably produced.

State of biomass trade: The exact numbers on available amount of biomass is missing in the Netherlands, there is need to quantify the tradable amount.

Problematic is also the reliability of supply of residues, barriers related to the legislation and insecurity of the markets.

Currently there is no reliable data on how much biomass is traded in the market, and what the actual potential of biomass is.

Mr. Paul Alfing (right) and Mr. John Jensen during the discussions. Picture: Peter Rechberger, AEBIOM.

11 Second discussion round, chaired by Mr. Jean-Marc Jossart

11.1 Expectations, challenges, threats faced by the industry

C: (by Mr. Jensen) Sugar industry is looking for less dependency on fossil fuels, and long term stable solutions. Fossil fuel volatility and carbon print are important issues for us.

Renewable energy solutions interest us: pellets, biogas, using by-products of sugar production. Sugar factories in Europe are already biorefineries (food, feed and fuel), there is strong competence in agricultural raw material processing.

Politics are the key. Stability is needed in subsidies and incentives. We do not want to speculate on when to build a new sugar plant in Europe.

For the next 10 years huge demonstration projects are needed (biorefineries) and some incentives supporting them.

Q: Can e.g. biogas be produced in one country while getting subsidies in another country?

Final discussions chaired by Mr. Jean-Marc Jossart. Picture: Peter Rechberger, AEBIOM.

C: Improved communication is needed. There is a “fear of biomass”. Small companies have it even more difficult.

C: We are already using mostly the best available technologies (lime producer). Energy requirements are minimised, efficiency 85-90%. Producing 1 ton lime means 1 ton of CO_2. Most of that comes from the raw material through the process, like in cement industry. We are located in remote area, close to potential big biomass resources. But stability of the quality (of biomass) creates problems, quality of fuel very important for us. Also price volatility and biomass availability questions are problematic. We need good predictability in fuel supply.

C: We study possibilities to use biomass. We process lot of agricultural waste, and there are by-products available. When considering the value of the product, Food is first priority, second is the animal feed, only the third option is to use the raw material to produce energy. However, sometimes we have to pay for the discharge of the by-products.

C: We face lot of technical challenges (not with wood, but with other fibrous biomasses). We need technologies to improve flue gas treatment. We do not have any funds available for that kind of investments. We have several active development projects to convert biomass to energy in our own installations, or elsewhere. We also study how to upgrade fuels for transport, which would give better value for the product.

11.2 Where do we need more regulations, or less?

C: we don’t say that we need more or less regulations. We need fair regulations, based on facts, which lead to fair competition with other sectors, but also with importers. Quite stable regulation would be nice.

C: Recognition of co-processing is needed when calculating CO_2.

Q: (by Jean-Marc Jossart) Should the national action plans be ambitious or let the market play?

C: Target has to be very ambitions, strategic vision is needed. It has to be communicated in such way that everybody understands how challenging this is. For example: To replace all the natural gas in Germany almost all the agricultural would be needed for biogas production. The magnitude has to be communicated to the public that they understand how huge the issue is.

Q/C: Distinction between the low energy density and high energy density fuels should be made. Would it be useful to provide some incentive to use the first ones in closer distance to the production site?

C: Europe needs more technical sound reasoning than political decisions. Due to quality issues biodiesel should rather be used in less sophisticated solutions (house heating) than in highly sophisticated car engines. Targets and incentives maybe only for the second generation biofuels, which are more environmentally friendly.

C: Domestic heating sector is bigger than transport, but it is a pity that discussions are focussing mainly on transport.

11.3 What would the industry need? More/ better statistics, potential assessments, price data?

C: Local potential assessments are not available. We need more information about the availability and good statistics.

C: A platform for users and producers to meet traders, suppliers, waste producers, end-users etc. is needed.

C: Efficiency has improved in CHP plants. They often would have an opportunity to get access to the newest technology. But financing institutions wants reliable technology (old = reliable). Support is needed to get new technology in use. Also better technology transfer between countries in necessary.

11.4 Conclusions by Mr. Jean-Marc Jossart

There are clearly opportunities for biomass use in "new industries" that are mainly using waste (tyres, sewage sludge, animal meal, fats) for the moment.

The sector calls for more logic and rationalities behind the policies to favour:

- Proximity in using biomass
- Efficiency of conversion
- Schemes should favour first best economic viability routes
- Less protectionism
- More level playing field for CO2 and for electricity support schemes

Some recommendations were highlighted

- More statistics on the biomass availability/potential, including waste
- Platform of biomass suppliers and users
- Support to demonstration projects of new technologies
- Innovative system like swap (flexibility in location of the projects)
- Improve communication to make biomass more reliable regarding fuel supply.

11.5 Final announcements

Jean-Marc Jossart: Commission asked AEBIOM to set up Technology Platform on Renewable heating and cooling. There will be a kick-off meeting on April 15th. More information from Jean-Marc for industries interested to join.

Eija Alakangas: EUBIONET III would need industrial members for the steering committee to provide feed-back of our work in the project. The first meeting will be organised in Hamburg (17th European Biomass Conference).

Appendix 1 – Participant list

EUBIONET3 workshop "Bioenergy in Industry" organised by AEBIOM, March 12, 2009, Brussels, REH
Final list of participants

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