Biomass Futures demand workshop report (D8.5)

Demand for Biomass- How likely is to be met?

30.06.2010, 9.00-14.00 at Albert Hall Complex, Chausée de Wavre 649-651, Brussels

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Preface

This publication is part of the BIOMASS FUTURES project (Biomass role in achieving the Climate Change & Renewables EU policy targets. Demand and Supply dynamics under the perspective of stakeholders - IEE 08 653 SI2. 529 241, www.biomassfutures.eu) funded by the European Union's Intelligent Energy Programme.

1 Purpose of the workshop

The workshop aimed to discuss with industry & policy stakeholders the promising market segments for future biomass penetration in the heat, electricity/ CHP and transport markets & understand the key factors affecting demand from industry & policy. Key elements presented were:

- Current market state and biomass shares
- Policy driven demand
- Industrial demand (energy & non- energy)
- Key factors that will affect future demand

This workshop was intended as a basis for future interactions with stakeholders, allowing discussion and input into the work of the Biomass Futures Team in defining the market segments biomass can play a role in the future and validating the key factors affecting their future penetration.

2 Synopsis of the presentations

2.1 BIOMASS FUTURES: Current State of biomass in the heat, electricity/ CHP and transport markets

Calliope Panoutsou (Imperial College London) opened the workshop by introducing the Biomass Futures workshop and the purpose of the workshop as part of Biomass Futures's work flow. The project aims to quantify the sustainable role biomass can play to meet the targets of the EU RED for 2020. To do so, the consortium works through a series of interrelated work packages in order to provide a better understanding of bioenergy demand and supply dynamics, and to what extend and how a sustainable production and use of domestic and imported biomass sources can contribute to EU27 energy needs. The project will be executed in close collaboration with key stakeholders to identify sustainable options for bioenergy development and deployment to the year 2030, and to increase awareness about the opportunities and the risks, and how these can be addressed. She finally gave a short outlook of the growth rates in the different biomass sectors (biogas, biofuels, solid biomass, bioheat & bioelectricity) based on recent statistics.

The aim of this demand workshop was to map current & future demand issues and discuss how the different market segments shape their demand prospects in the future and where biomass is expected to play a role. This report provides a concise summary of the presentations given on the issues mentioned above and also of the discussions between Biomass Futures team members and attendees of the workshop. For a full documentation of the workshop's presentations, please visit www.biomassfutures.eu.

2.2 Biomass demand and supply dynamics in EU27

Mr Par Arvidsson (McKinsey & Company) presented the recent work the company has done for biomass supply & demand dynamics in EU27.

The starting point of all the respective analyses in the EU is the strong policy focus on biomass to play a very important role in meeting its 2020 targets (in all energy sectors). The expected growth in

biomass, waste and biofuels for 2020 equals 850 TWh, which is the same amount of growth that is expected from all the other renewables together.

However, current market growth rate (for heat, power & transport) is approximately about a third of what is expected in the EU27 policy scenarios. If growth continues with the same trajectory then only an additional 300 TWh (out of the 850 TWh to meet that 2020 targets) will be implemented.
This implies that achieving the policy expected growth will likely require successfully mobilizing biomass demand in both the energy industry and in residential and commercial heating applications along with ensuring long term sustainable supply options.

Therefore, the key issue that remains in all the scenarios is how the required supply can be achieved without compromising the needs from other sectors like food& feed, construction, etc. According to the company's study there is technically enough unused land and this along with forest/agricultural residues available globally are enough to meet the demand without compromising these needs. Here, it was emphasized that the major share is still expected to derive from land converted to dedicated energy crops.

European biomass supply for heat and power could be doubled through 2020 and reach up to 2,000 TWh in an aggressive mobilization scenario –but this mobilization is not happening at the moment.
Even in this aggressive mobilization scenario, Europe would still require imports from approximately 120 pellet mills (each producing 500,000 tonnes/ year) to satisfy domestic biomass demand. Regions of imports are mainly North America and Brazil.

Lastly Mr Arvidsson, mentioned that there is a large inherent cost improvement potential as volumes and experience grow –efficiency and technology improvements can make biomass heat and power a cost competitive technology compared to coal and gas. Competitiveness would be enhanced if supply could have a 15- 20% cost reduction, mainly through scaling and learning curve improvements in the energy crop plantations, and CO_2 price levels increased at the range of 30- 50 €/ton.

2.3 Policy driven demand for biomass & future scenarios/ GREEN-X model

Gustav Resch (TUV) presented an outlook of the GREEN-X modelling work on achieving the RES targets by 2020 (FORRES 2020 study) with a closer look on the role of bioenergy. His presentation was structured in four parts i) the key elements of the RED, ii) the Green-X tool, iii) scenarios for RES deployment, investment needs, cost & benefits and iv) future RES policy options.

Regarding the first issue he provided a time-series of policy steps towards the development of RED.

Following he gave an overview of the Green-X tool results for the effectiveness of current policies in the wind energy sector. He pointed out that the majority of EU Member States applies a feed-in-tariff system while only six countries use a quota obligation (based on green certificates) as their main instrument. Both support instruments are designed to be effective in increasing RES deployment along with minimizing the public costs over time. Under this assumption, feed-in tariffs have been more successful in terms of increasing wind energy (RES-E) deployment and improving investor attractiveness compared to quota systems.

He continued by analyzing different scenarios for the extent to which RES can meet the 2020 targets. Specifically for biomass he stated that based on their analyses it can cover up to 173 Mtoe which is almost 50% of the total RES potential (349 Mtoe). In terms of feedstock the highest share is

expected to derive from forest based feedstocks followed by agricultural ones and to a lesser amount by biodegradable waste.

Finally he presented a set of scenarios on the future RES deployment in EU based on the work undertaken in the 'futures-e' project.

He concluded by highlighting that the key policy elements in the near future should focus on harmonizing & strengthening national support for RES.

2.4 Biomass CHP in EU27

Thomas Bouquet (COGEN) presented the current state for biomass CHP in EU27 along with the main drivers and hindering factors for future implementation.

Gross electricity production from solid biomass almost tripled between 2001 -2008, reaching at 57.4 TWh. Most of the biomass has been used in CHP plants. The same stands for biomass heat production which reached more than 7.5 Mtoe in 2007, mostly generated in CHP plants.

The share of biomass in CHP plants varies significantly in different Member States, ranging from very low (≥2%) in countries like Ireland & Greece to almost 75% in Sweden and 48% in Finland. France, Austria and Portugal also have shares above 20%.

Biomass CHP still remains a very attractive option for industry as, depending on the process followed, heat requirements in this sector can be very substantial throughout the operating period.

2.5 Demand from the biofuels industry

Birger Kerkow (FNR/ Biofuels Platform) presented the current state for demand from the biofuels industry. His presentation included a brief introduction to the European Biofuels Technology Platform- EBTP- (www.biofuelstp.eu), a section on the biofuels market development and a description of the recent European Industrial Bioenergy Initiative (EIBI) under the SET plan.

The EBTP covers the full chain of biofuels production from feedstock to distribution and end use, and includes a wide range of stakeholders from the agro & forest industries, biomass associations, research institutes & Universities, NGOs, engineering & technology vendors, vehicle, marine & aircraft manufacturers, transport fuel blenders & distributors, biofuel producers as well as representative members from the bio- based industry. The Platform has a Steering Committee & five active working groups across the biofuel value chains and is active in most initiatives for the biofuel & bio- based economy.

Following, Mr Kerkow presented the impressive evolution of biofuels consumption in EU27 from 2000- 2008. Based on recent statistics released from Eurobserver, in 2008 biodiesel (rape & soy based) was the dominant biofuel in the EU27 market with more than 7.5 Mt, while bioethanol (sugar beet & cereal based) reached 2.8 Mm^3.

He stated that the market is clearly driven by policies & regulations, which are rather diverse across EU27 and pointed out that at this point it is of big importance to acknowledge that meeting the 2020 targets for biofuels is also relying on the fuel standards, the different blends available and the compatibility of cars to accept higher blends.

He highlighted that although there are variant recent studies for the biofuels mix required for 2020, it is still difficult to predict accurately the amount & quality of the required feedstocks due to differences in conversion processes, heterogeneity of the indigenous EU feedstock matrix and strong influence of the RED sustainability criteria on the final market product. Certainly, there are no clear winners but things are very case specific and the most crucial factors in the overall weighing are sustainable feedstock availability at competitive prices, logistics and process efficiency.

Mr Kerkow also presented the scope & main objectives of the European Industrial Bioenergy Initiative which is included in the SET plan and aims to enable the commercial availability of large scale bioenergy carriers with the active participation of the European Industry in the field. The Initiative includes plans for large scale demonstration plants in seven advanced conversion paths (combinations of thermochemical & biochemical routes).

Finally, he concluded that the preferred options to meet the 2020 targets are biofuels that are highly compatible with existing infrastructure and can be produced from a range of feedstocks which follow a rational set of sustainability criteria. To achieve this strong public- private partnership is required in order to manage the immediate need for finance and counterpart the foreseen risks.

2.6 Demand from the chemical industry

Mrs Eleftheria Athanassiadou (Chimar Hellas) presented the demand from the Chemicals & adhesives industry.

Firstly she gave an outlook of the industry sales per region, showing that EU27 had 537 billion € sales in the chemicals industry for 2007, being second after Asia that had almost 700 billion €. The respective world market has grown substantially in the last decade with a world sales growth rate of 4.8%- from 1,136 billion € in 1997 to 1,820 billion € in 2007. Within the EU27 the leading Member States are Germany (with a 25% share of the market), followed by France (14.5%), Italy (11%), Great Britain (10%) and the Netherlands (10%). Base chemicals (plastics/ synthetic rubber, petrochemicals, fibers, gases, fertilizers) have the higher share (44.8%) in the distribution by sectors followed by pharmaceuticals (27.4%).

Following, Mrs Athanassiadou presented interesting figures for the number of enterprises and the employment in the sector. The 29,000 chemical & pharmaceutical companies employ more that 1.8 million people which stands for 6% of the total manufacturing industry workforce. At this point she pointed out that the aforementioned workforce is better qualified (in skills, education & training) than the average of other manufacturing sectors and therefore the labour productivity increases faster.

Regarding industrial biochemicals she stated that there are good opportunities of converting biomass to chemicals and it is expected that the development of industrial biochemicals in biorefineries will help reducing oil import dependence and stimulate further growth of the sector when accounting for the appropriate synergies with energy and food. She then presented the main routes (current & future) of producing biochemicals.

Regarding projections for the future market shares, she said that the estimated current size of the biochemicals market is 51bn€ -77bn€ (3-4% of total global chemical sales) with pharmaceuticals constituting the majority. By 2025, it is expected that market will worth 175bn€-420bn€, equal to a chemical production market share of 7-17%.

Finally she concluded that the field is very dynamic and growth rates are expected to be high in the near and medium term futures. However, as was the case for biofuels, the key issues to successful future development are biomass availability, well developed logistics (with emphasis in transport & storage) as well as development of appropriate standards to assure quality & cost competitiveness.

2.7 Demand from the biomaterials industry

Antoine Peeters (Europabio) presented the key issues for biomass demand from the biomaterials industry. Firstly he introduced Europabio, which was founded in 1996 and has 66 members operating worldwide. Through their national associations, EuropaBio also represents over 1,800 small and medium-sized enterprises involved in research, development, testing, manufacturing and commercialization of biotechnology applications. They cover products related to food, personal care, cosmetics, detergents, textiles and paper.

The key elements of their strategy are to optimise the use of renewable green inputs through high efficiency manufacturing, reduce the use of environmentally persistent chemicals and materials and produce carbon neutral bio-degradable products. He also emphasised the dynamic growth of the bio-materials sector which is mainly driven the increase in oil prices and the strong focus on climate change actions which support the development of biotechnology and related products.

Following he presented the bio refinery concept with a set of promising routes and a roadmap and pointed out that long term legal & political commitment is essential to ensure its future success. As mentioned by previous speakers the key elements for future implementation are the improvement of secure access to sustainably sourced raw materials and the optimisation of infrastructures and logistical capabilities, and remove local and regional legislative obstacles.

3 Discussions following the presentations

Following, the discussion focused mainly on the key main market segments that biomass can play a role in the future within the heat, electricity/ CHP and transport sectors. Mrs Panoutsou presented the initial structure from the work undertaken in the Biomass Futures project and all participants agreed to the following segmentation for future analyses.

Heat	**Electricity/ CHP**	**Transport**
Households	***Industrial facilities***	***Aviation***
Rural stoves	Industry, CHP	***Rail***
Rural district heat	Industry, electricity generation	***Marine***
Urban stoves	***Industry - utilities***	***Metro/ Tram***
Urban district heat	Utilities, electricity generation	***Road***
Services		Road-Bus
Rural district heat		Road- Motorcycles
Rural boilers		Road Cars
Urban district heat		
Urban boilers		
Industrial facilities		
Industry, district heat		

Then Mrs Panoutsou presented the two questionnaires prepared from the Biomass Futures team on the key factors affecting the future implementation of biomass and a general discussion took place on grading their importance in the market segments.

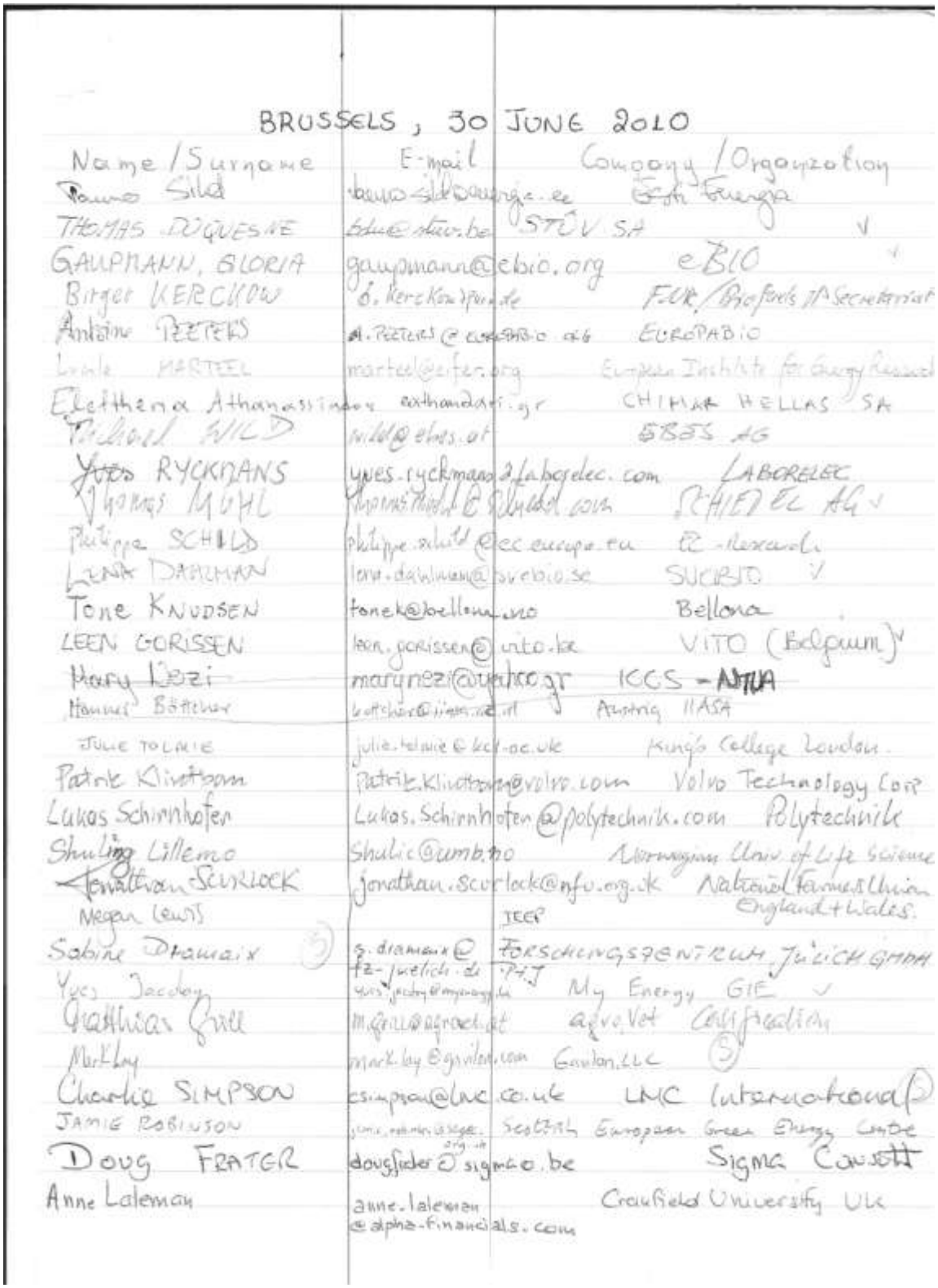
4 Conclusions

Calliope Panoutsou thanked the participants for their interest & contribution in the discussions during the workshop. She then concluded that the work for demand analysis within the Biomass Futures project will continue and focused stakeholders' teleconferences & interviews will take place starting from September in order to provide input & further validate the results of the analysis on market segments & key factors. Afterwards the team will prepare three reports which will be sent to stakeholders end January 2011 for comments.

Annex A Agenda

09.30 – 10.00	BIOMASS FUTURES: Current state of biomass in the heat, electricity, CHP and transport markets Calliope Panoutsou, Imperial College London
10.00 -10.20	Biomass demand & Supply dynamics in EU27 Nicolas Denis, McKinsey & Company
10.20 – 10.40	Policy driven demand for biomass & future scenarios/ GREEN-X model Gustav Resch, TUV
10.40 – 11.00	Biomass CHP in EU Thomas Esdaile-Bouquet, COGEN Europe
11.00 – 11.20	Tea/ Coffee Break
11.20 – 11.40	Demand from the biofuels industry, Birger Kerkow, Biofuels Platform
11.40 – 12.00	Demand from the chemical industry Eleftheria Athanassiadou, Chimar Hellas
12.00- 12.20	Demand from the biomaterials industry Antoine Peeters, Europabio
12.20 – 13.00	Discussion- Key factors affecting demand
13.00 – 14.00	Lunch

Annex B List of participants



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