Biomass Demand for Biofuels

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Secretariat, EBTP
Outline

- Introduction to the EBTP
- Biofuels market development
About EBTP

Agro-feedstock producers

Bio-based industry (sugar, paper, enzymes, etc)

Forestry industry

Biofuels producers

Biomass associations

Transport fuel blenders & distributors

Research institutes

Vehicle manufacturers, aircraft, marine

Universities

Engineering and technology vendors

NGOs

15 March 2012  Workshop on Biomass Supply Challenges  www.biofuelstp.eu
Organisation of EBTP

- Steering Committee
  - Algae Task Force
  - WG1 Biomass availability and supply
  - WG2 Conversion processes
  - WG3 Product distribution and use
  - WG4 Sustainability assessment
  - WG5 Markets and regulation
  - WG EIBI

- Secretariat

- Stakeholder Plenary
Evolution of EU27 biofuels consumption
(EurObserv’ER 2011)
15.000
20.000
30.000
40.000
50.000


Bioethanol
Pflanzenöl
Biodiesel

Keine Biokraftstoffe im Jahr 1990; Pflanzenöl bereits seit 1992 für biogene Kraftstoffe verwendet, Bioethanol seit 2004; 1 GWh = 1 Mio. kWh.
Quelle: BMU-KI III 1 nach Arbeitsgruppe Erneuerbare Energien-Statistik (AGEE-Stat); Hintergrundbild: BMU / Dieter Böhme; Stand: März 2012; Angaben vorläufig
2010 EU biofuel production/consumption (Eurob’servER 2011)

Production in EU:
- 80 % Biodiesel, mainly based on rapeseed and soybean oil
- 20 % Bioethanol, based on sugar beet, wheat, corn etc..

Production capacity:
- Biodiesel 22.257 Mt
- Bioethanol: 7.5 M m³

Consumption:
- 10.742 Mtoe Biodiesel
- 2.934 Mtoe Bioethanol
- 0.222 Mtoe others
Transport Fuels in the nREAPs by 2020 (JRC, 2011 Update of the Technology Map for the SET Plan):

- RES share in transport 11.6 %/30 Mtoe
- Biofuel contribution 9.5 %
- Biodiesel: 21.6 Mtoe
- Bioethanol/ETBE: 7.3 Mtoe
- Biomethane, pure vegoils et. 0.7 Mtoe
- Biofuels from waste, residues, lignocellulosics etc: 2.7 Mtoe (9 % of biofuel consumption)
- Biofuel imports: 11 Mtoe
Biofuels: diverse legal requirements in the EU

2010 European Biofuels Blending Mandates

Source: UFOP press release 10 Jun 2010
Use of biofuels in 2020 also depending on fuel standards (B5/B10)

<table>
<thead>
<tr>
<th>Biofuels use without B10 (Mtoe)</th>
<th>Biofuels use with B10 (Mtoe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% vol blend bioethanol in petrol</td>
<td>10.1</td>
</tr>
<tr>
<td>5% vol blend biodiesel in diesel</td>
<td>8.3</td>
</tr>
<tr>
<td>10% vol blend biodiesel in diesel</td>
<td></td>
</tr>
<tr>
<td>Maximum contribution from low blends</td>
<td>18.4</td>
</tr>
<tr>
<td>10% biofuel target</td>
<td>33.0</td>
</tr>
<tr>
<td>Contribution needed from other biofuel applications</td>
<td>14.6</td>
</tr>
</tbody>
</table>

Current and advanced bioenergy value chains - multiple options for feedstocks, conversion processes and end use

**Feedstocks**
- Lignocellulosic energy crops
  - Energy grass
  - SRC
- Multi purpose crops
  - Sugar crops
  - Oil crops
  - Starch crops
- Residues / wastes
  - Forestry residues
  - Agricultural residues
  - Biowaste streams
    (household/industry)
- Aquatic biomass
  - Microalgae
  - Macroalgae
  - Halophytes

**Conversion processes**
- Thermochemical conversion
  - Pretreatment/fractionation
    - Torrefaction
    - Pyrolysis
  - Gasification / Syngas cleanup
    - Fuel synthesis
- Biological/chemical conversion
  - Pretreatment/fractionation
    - Hydrolysis
    - Fermentation
    - Upgrading
    - Reforming
    - Refining
    - Catalysis
    - Metabolic engineering

**End use**
- Biofuels
  - Liquid
    - Fatty Acid Methyl Ester (FAME)
    - Ethanol
    - Methanol
    - Butanol
    - Alkanes/hydrocarbons
    - Hydrogenated Vegetable Oils
    - Biomass to Liquid (BtL)
      - Jet Fuel
- Gaseous
  - Methane
  - Synthetic Natural Gas (SNG)
  - Dimethylether
  - Hydrogen
- Heat
- Electricity

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Amount and quality of required feedstocks difficult to predict

- Different conversion processes require different feedstocks
- Fragmented & highly heterogeneous (in quality and quantity) supply of bio-feedstocks across the EU Member States
- No clear winner in terms of conversion route or end product
- Biomass logistics will play a key role
- Process efficiency (how much feedstock/toe biofuel) still unclear
- Strong influence of RED sustainability criteria (GHG balance, double credit for targets)
- Importance of domestic feedstock/biofuel production vs. imports
- Overall energy demand for transport in 2020 uncertain
Summary: Biomass demand for biofuels

- Biofuels market driven by policies and regulations/mandates
- Feedstock flexibility and/or new biofuels with higher compatibility with existing infrastructures are the preferred options for advanced conversion routes to be implemented in complement/synergy with current biofuels, to meet the 2020 targets.
- Demo and reference plants are critical for development of advanced biofuels value chains: Public/private partnership needed to manage financing and risks!
- This has to be accompanied by strong activities to improve sustainable feedstock availability (including logistics), as well as rational criteria on how best to allocate biomass when different uses are possible.
Contact Information

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Thank you for your attention!