

Biomass Potentials and the Effect of their Use on Social Economic Parameters Workshop

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Agenda

- Effect of the energetic use of biomass on social economic parameters (discussion of several parameters)
- What is a biomass potential?
- How to interpret a biomass potential analysis?
- Example for a biomass potential analysis Austria
- Common statement (?)

Effects on social economic parameters

- Labour
 - Generates labour (70 - 400 per PJ in developed countries)
 - Generates mainly unskilled labour and so reduces potential for generating skilled labour
 - Increases social income (3 – 20 M€ per PJ)
- Environment
 - Pos/neg. impacts on soil quality and biodiversity
 - Emissions (e.g. fine particles)
 - Transport activities
- National safety
 - Diversification of energy supply
 - Increased independence and less money paid for imports (domestic biomass)

What is a biomass potential (theoretic access)

- Theoretic potential:
ha * yield/ha*a
- Technical potential:
All you can collect from the theoretical potential (ecological restraints, agro technological restraints, topographic problems etc.)
- Economic potential:
All biomass available up to a specified cost level (taking into account the (elastic) price band of competitors on the market)
- Realistic potential:
All biomass available without inducing negative social or social economic impacts and respecting technology and market development issues.

Bioenergy Potential

example wood for energetic use in Austria

- **Theoretical potential:** ca 12 m³ wood substance growing per ha*a incl. roots, twigs etc. ~ 6 t_(dry)/ha*a
- **Technical potential:** ca 6 m³ wood per ha*a = ~ 3 t_(dry)/ha*a
= wood mass taken out of the forest (roundwood, firewood, wood chips)
- **Economic potential for energetic use:** ~ 2 t_(dry)/ha*a
(including all wastes for wood processing as sawmills, furniture industry etc.).
Supply to pulp and chipboard industry not considered.
= wood processing by-products + firewood etc.
- **Realistic potential:** in Austria ca 25 % of the economic potential is needed for pulp and chipboard production, so realistic potential for energetic use is only ~ 1,5 t_(dry)/ha*a

Bioenergy Potential

example corn for energetic use in Austria

- 1,4 Mio ha arable land used for growing field crops, max. 0,2 Mha additional land available (set aside land, land use change, etc; 0,005 Mha/a arable land lost for non agrarian uses)
- Theoretical potential (Yield av. corn/maize 8 dt/ha*a, 1,6 Mha) **12,8 Mdt**
- Technical potential (no technical restraints) **12,8 Mdt**
- Economic potential
(competition with other crops (~6 Mdt),
competition with use of corn for food (5,2 Mdt) **1,6 Mdt**
- Practical potential (50 % for other energy crops) **0,8 Mdt**

How to interpret a biomass potential analysis

- What are the boundary conditions for the analysis ?
 - Realistic restraints imposed? (technical, ecologic, economic)
 - Legal boundary conditions discussed and respected?
 - Economic and socio economic boundaries addressed?
- Is the motivation of the biomass producers (land owners/farmers) etc. considered?
- Who are possible competitors for the land use or the biomass and how are their interests considered in the analysis?

Example Austria

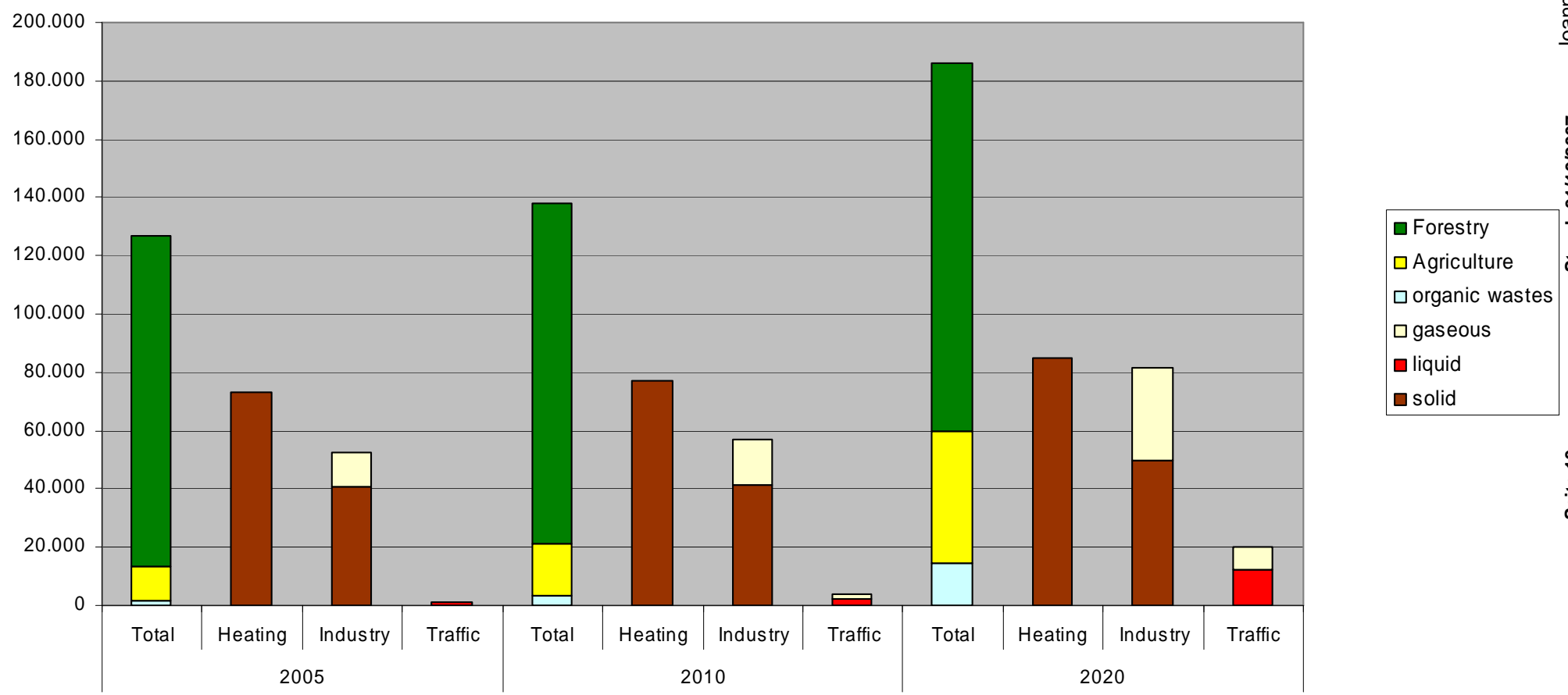
Question and boundary conditions

- **Question:** Can the Austrian legal regulations on renewable energy use be achieved by using the biomass potential?
- **Boundary conditions** and assumptions agreed with the client:
 - Time frame: 2005 - 2020
 - Legal regulations and political expectations (government programs)
 - Imports and exports of biomass and food unchanged
 - Non energetic use of biomass unchanged (food, sawmills, pulp, chipboard, starch etc.)
 - Land use unchanged (forests, arable land, grassland (also for SRC))
 - Priorities of energetic biomass use: automotive fuels up to to legal requirements, residential heating according prognosis, industry and power supply takes the rest using CHP for all new applications.
 - Technology development: Gasifiers after 2010; BtL: 1 big industrial plant until 2020

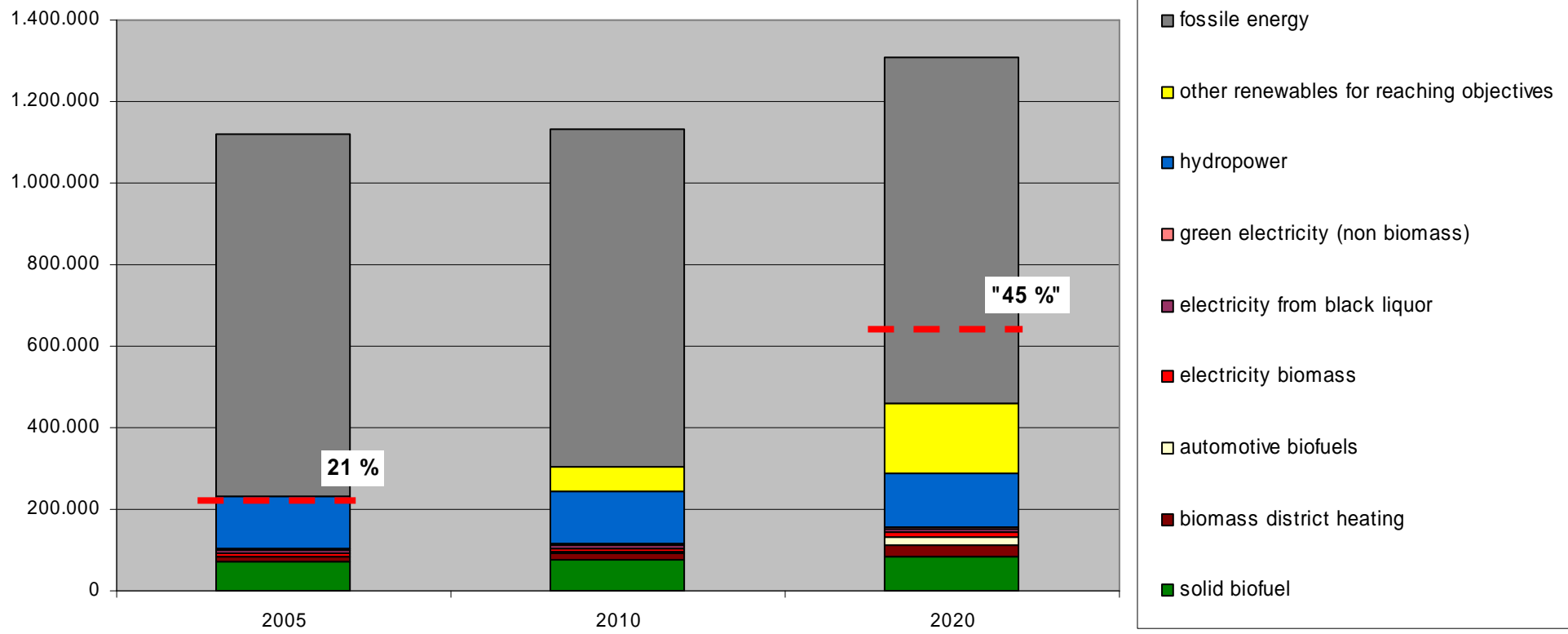
Example Austria data sources and Situation 2005

- Data sources: prognosis on energy use, energy statistics, agro economic statistics
- Situation 2005 Austria:
 - bioenergy production 126 PJ representing ~ 12 % of total energy use (114 PJ wood and 12 PJ biogas)
 - Ca. 50 % of the produced wood is used for energy (including industrial waste wood), rest for joists, boards, pulp, chipboard, etc.

Example Austria: Bioenergy potentials and use in TJ/a



Example Austria: Energy Use in TJ/a



Statement

- Use of biomass potential analysis:
 - only, if boundary conditions are clear and appropriate
 - only, if boundary conditions reflect also possible economic, social and social economic conflict areas
 - interpretation is possible only along this boundary conditions
 - An increased potential does not mean a higher share of bioenergy or a lower GHG emission in the future

- Bioenergy potentials analysis is essential for future biomass technology development (=> higher efficiencies !!!)
- Take into account the volatility of markets at the moment!