

The Future of Bioenergy

Innovative and efficient

Peter Rechberger

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Venice, 26 May 2009

AEBIOM

AEBIOM – European Biomass Association



- Representing and promoting interests of bioenergy stakeholders
- 33 national associations
- More than 70 companies
- Activities : lobbying, workshops, newsletter, projects, etc.
- Based in Brussels – Renewable Energy House

Join Us



Content

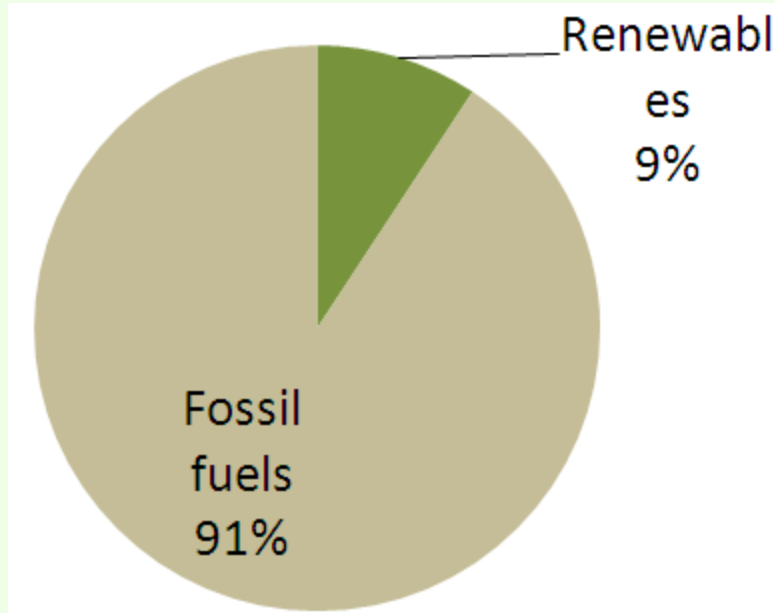
Current energy mix

Technologies already in use
(CHP, DHC, Pellets)

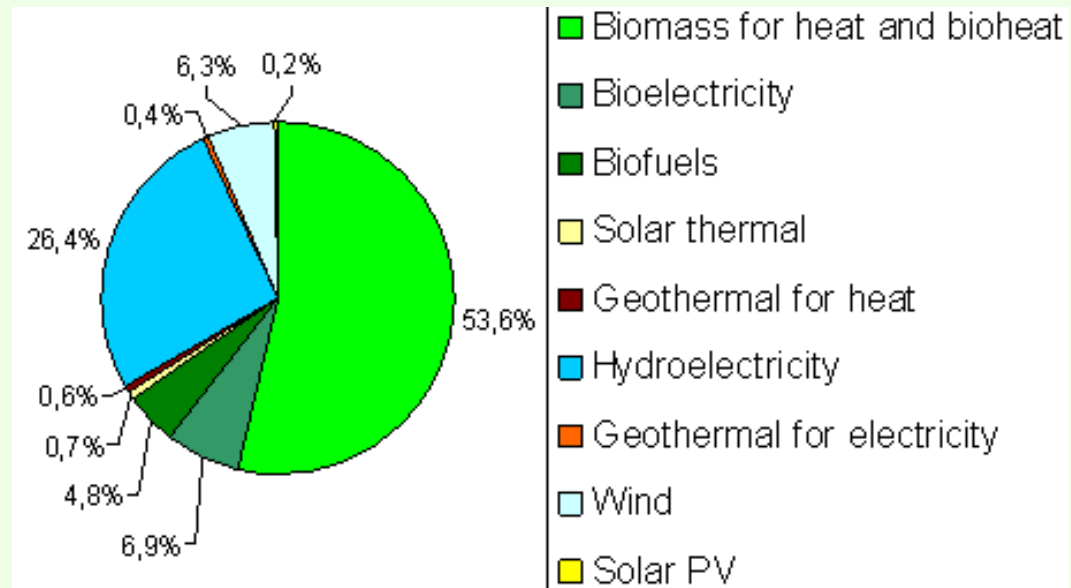
Future state of the art
(Biogas, Biorefineries, Algae)

Final energy consumption

Final energy consumption 2006
1176 Mtoe



Renewables 2006
112 Mtoe



*Bioenergy represents 2/3 of Renewables
heat -> electricity -> transport biofuels*

Source : Eurostat

1 toe = 41,9 GJ = 11,6 MWh

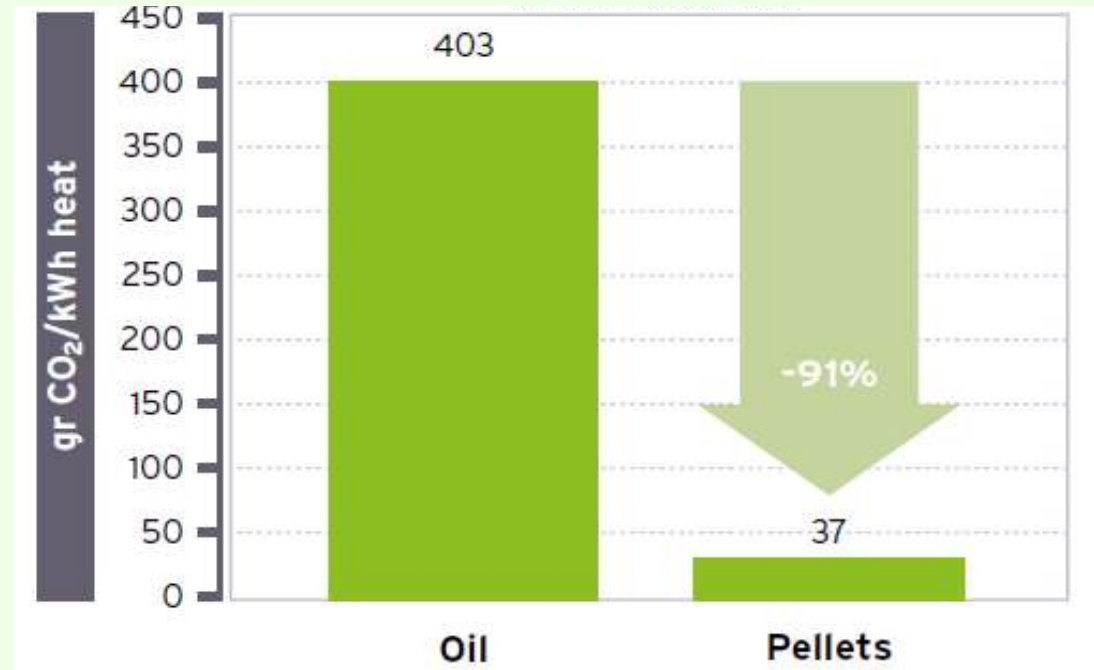
Pellets

Why pellets

- Standardised fuel
- High energy density (transport, storage)
- Low CO₂ emissions (zero in ET, high reduction on LCA basis)
- Lower investment in power plants

Pellets are reducing CO₂-eq emissions by 91% compared to oil (heating oil light)

CO₂ eq. savings of pellets compared to oil; LCA basis (Jungmeier, 2008)



Source : AEBIOM workshop on pellets – pellets Roadmap



DH with renewables

Austria



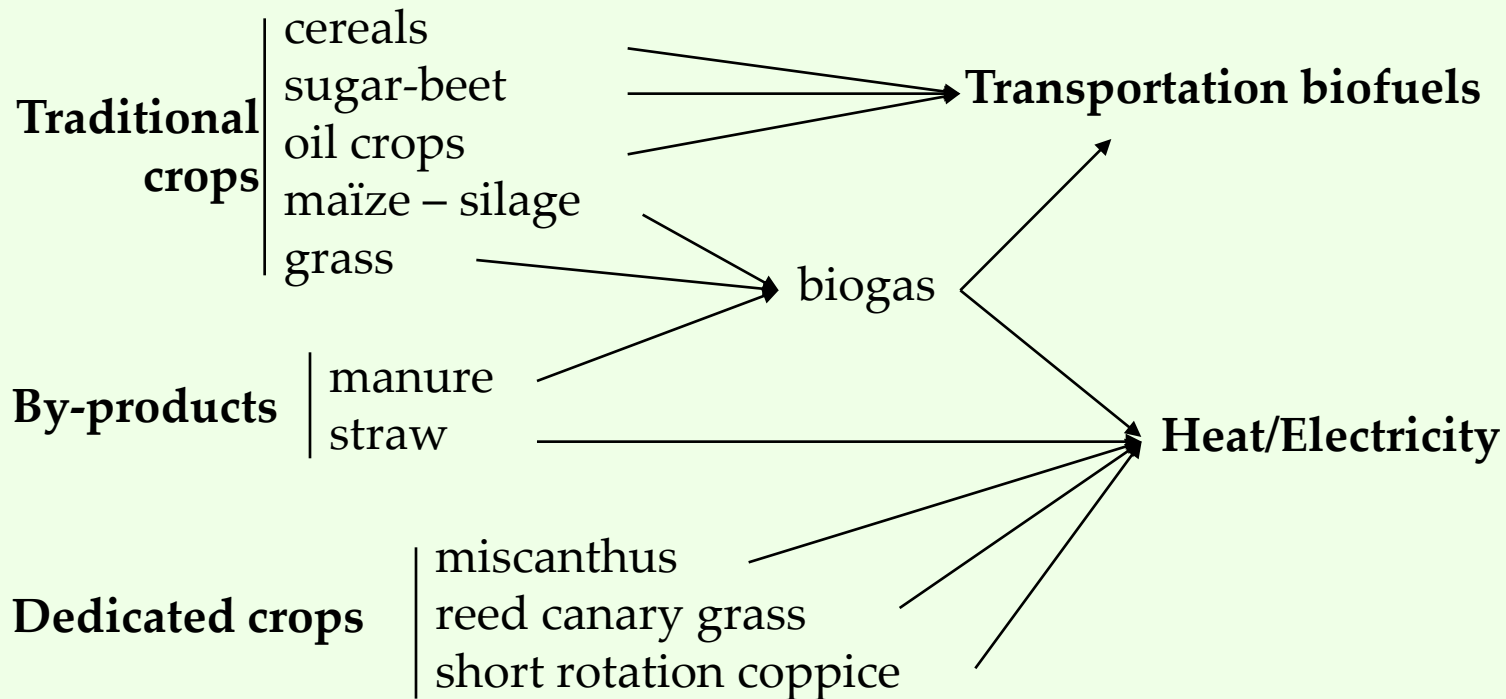
Source : www.bios-bioenergy.at



- Decentralized power – local biomass supply
- Multi biomass fuel
- District heating - Efficient
- RE combination

Biomass from agriculture

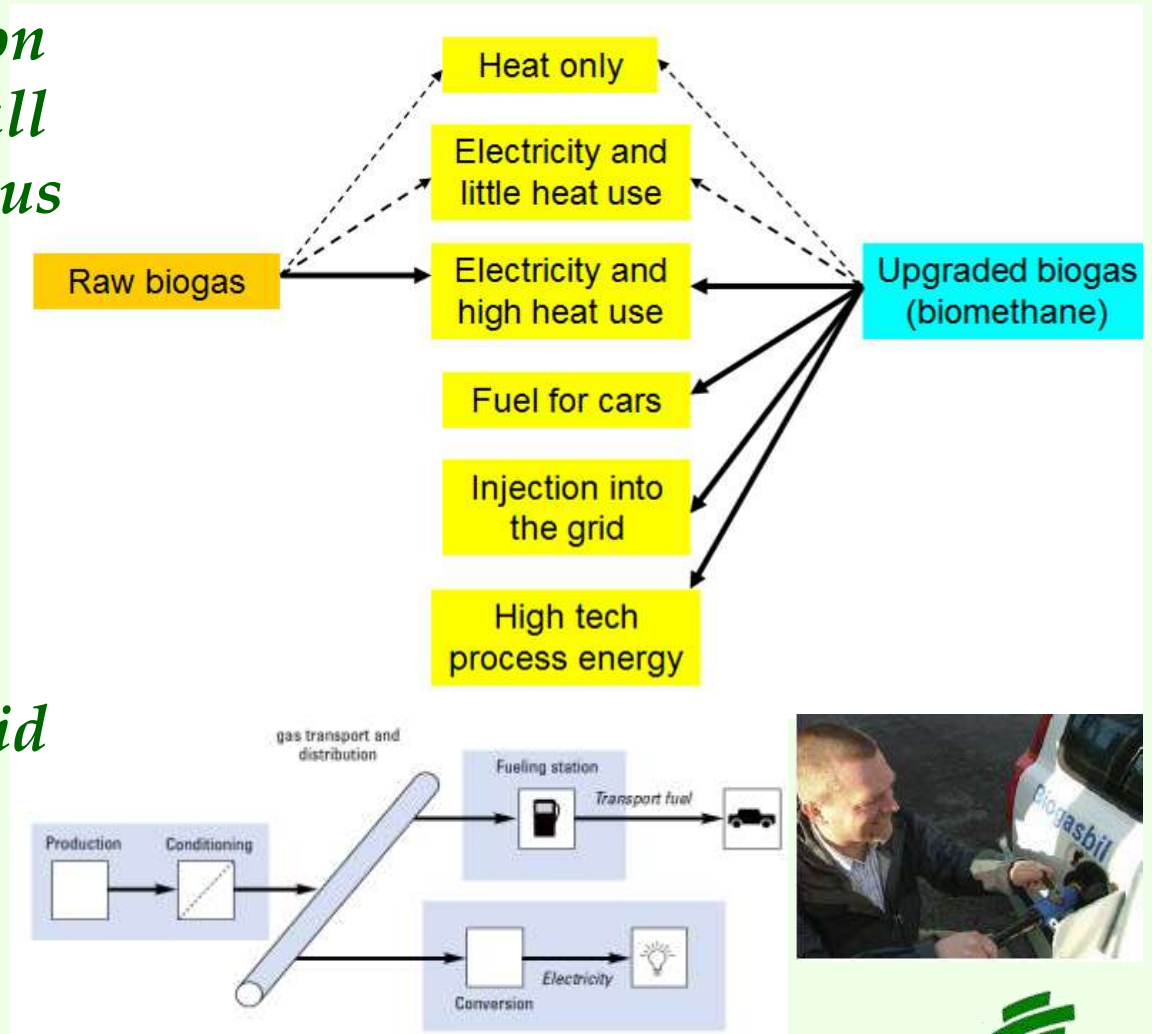
Agricultural biomass should increase significantly



Algae

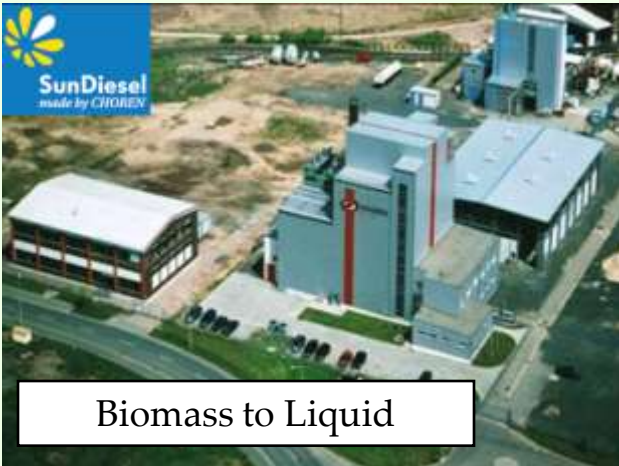
Biogas

- *Enhanced fermentation process, adaptable to all biomass (inhomogeneous waste, lignocellulosic material)*
- **CHP**
- *Biogas networks for DH and common upgrading facilities*
- *Use of existing gas grid*
- *Vehicle fuel*
- *Chemicals*
- *CO2 sequestration*



Transport biofuels

2nd and 3rd generation of liquid biofuels for transportation



Biomass to Liquid



Jatropha



Lignocellulosic Ethanol



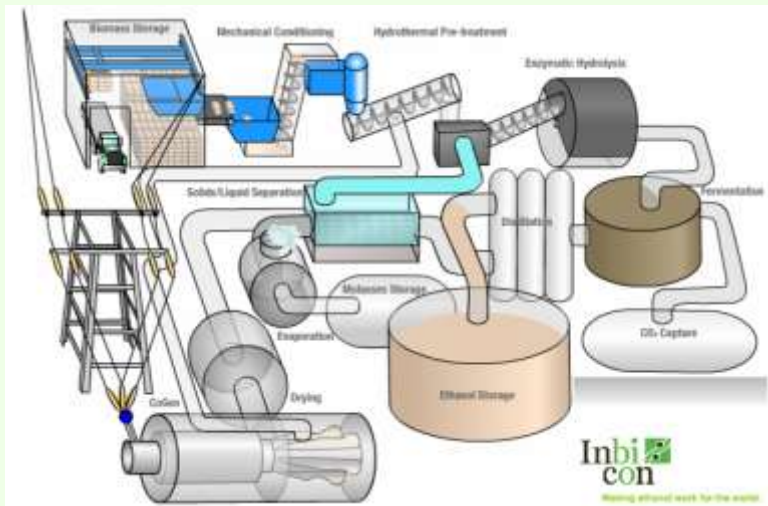
Algae

Source :W. Soetaert, NILE project

Biorefineries, cycle process

- *Fuel, power and bio-based products*
- *Integrated processes enhance overall efficiency*
- *Versatility similar to today's petroleum refinery*
- *Combining CHP, energy crops, waste water treatment, ethanol, animal feed, ...*

Example: **Inbicon biorefinery**
(ethanol, CHP, animal feed)



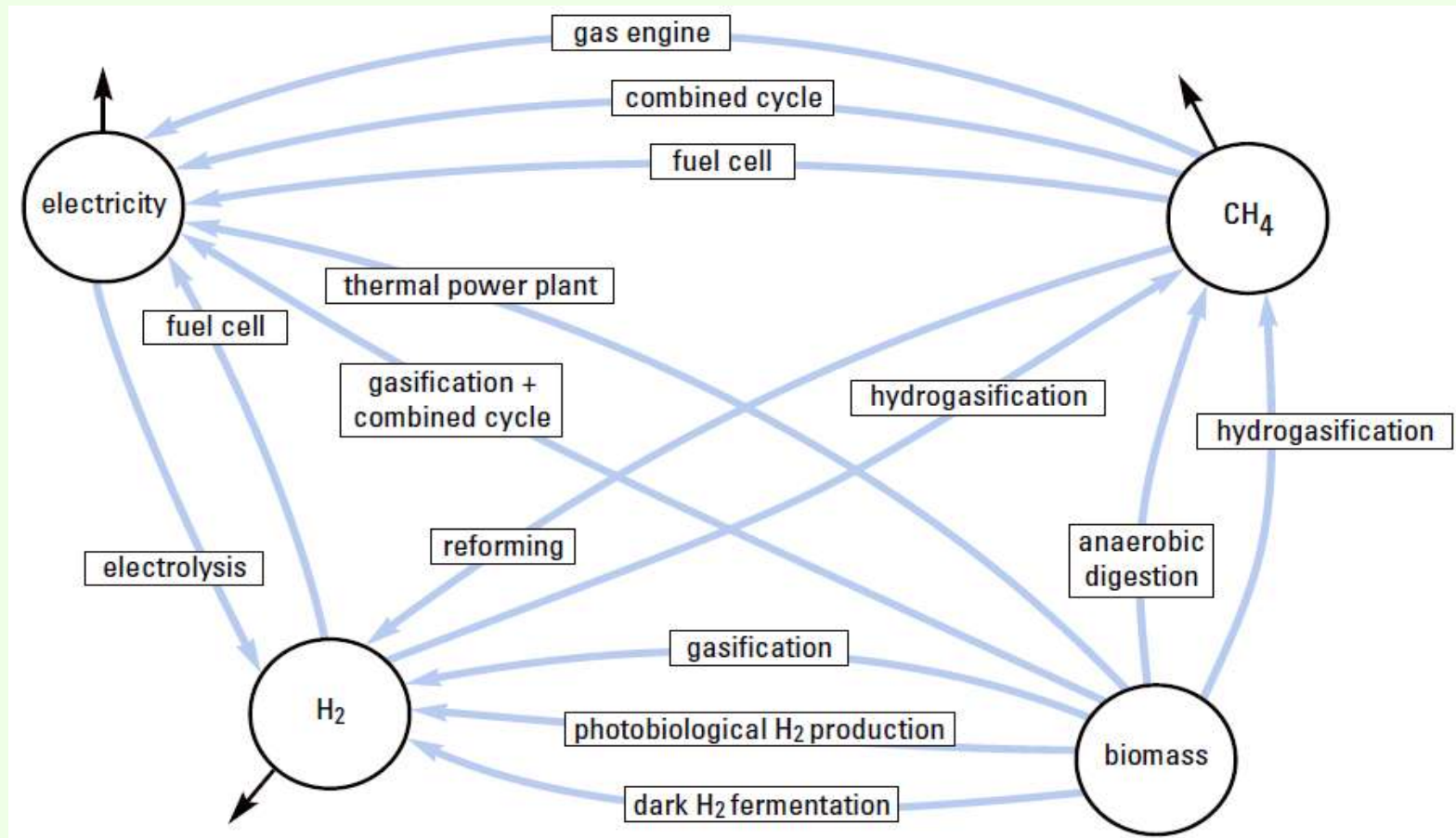
Example: **Enköping**

(CHP, DH, wastewater treatment, salix, fertilizer)



Conversion between energy carriers

- Hydrogen economy
- Bioelectricity
- Interlink with biogas
- Ethanol



Source : Reith et al, 2003

Summary

- Low temperature heat 100% renewable, even before oil runs out
- Heat will stay the most important sector for biomass
- Higher efficiencies, minimized environmental impact
 - large heat users
 - district heating & cooling
 - decentralisation
 - small scale DHC
 - no bio-electricity alone
- Fuel flexibility
- More agricultural fuels (energy crops, residues, waste)
- Decentralised biogas and biogas injection in gas network
- Biomass could play an important part in “hydrogen economy”

Thank you for your attention

Peter Rechberger
rechberger@aebiom.org

WORKSHOP

Biomass for District Heating and Cooling
Brussels, 22 June 2009