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Biofuels
TECHNOLOGY PLATFORM

The European Biofuels Technology Platform Strategic Research Agenda: main conclusions and focus on fuel distribution & end use R&D priorities

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Transport Fuels: Crucial factor and driver towards sustainable mobility

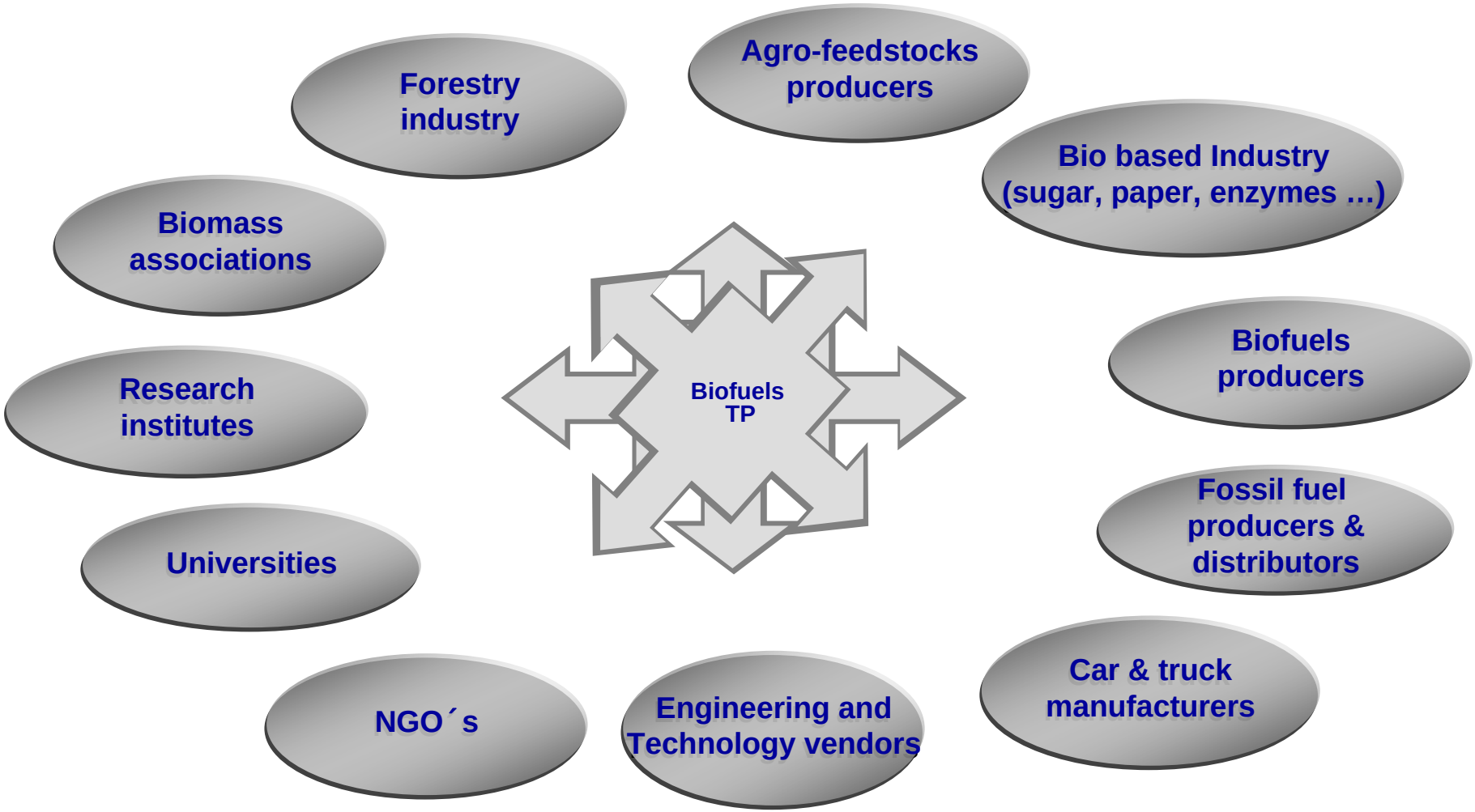
Vienna, May 28th 2008

in cooperation with bmvit

Outline

- Introduction to the European Biofuels Technology Platform
- Strategic Research Agenda & Strategy Deployment Document
- Fuels distribution and end use R&D priorities
- The way forward

Biofuels TP: stakeholders



Mission Statement

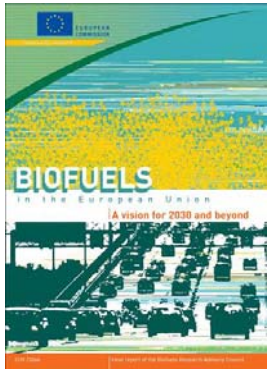
The Mission of the European Biofuels Technology Platform is to contribute to the development of:

- **cost-competitive world-class biofuels technologies,**

- a **healthy biofuels industry** supplying **sustainable biofuels** in the European Union,

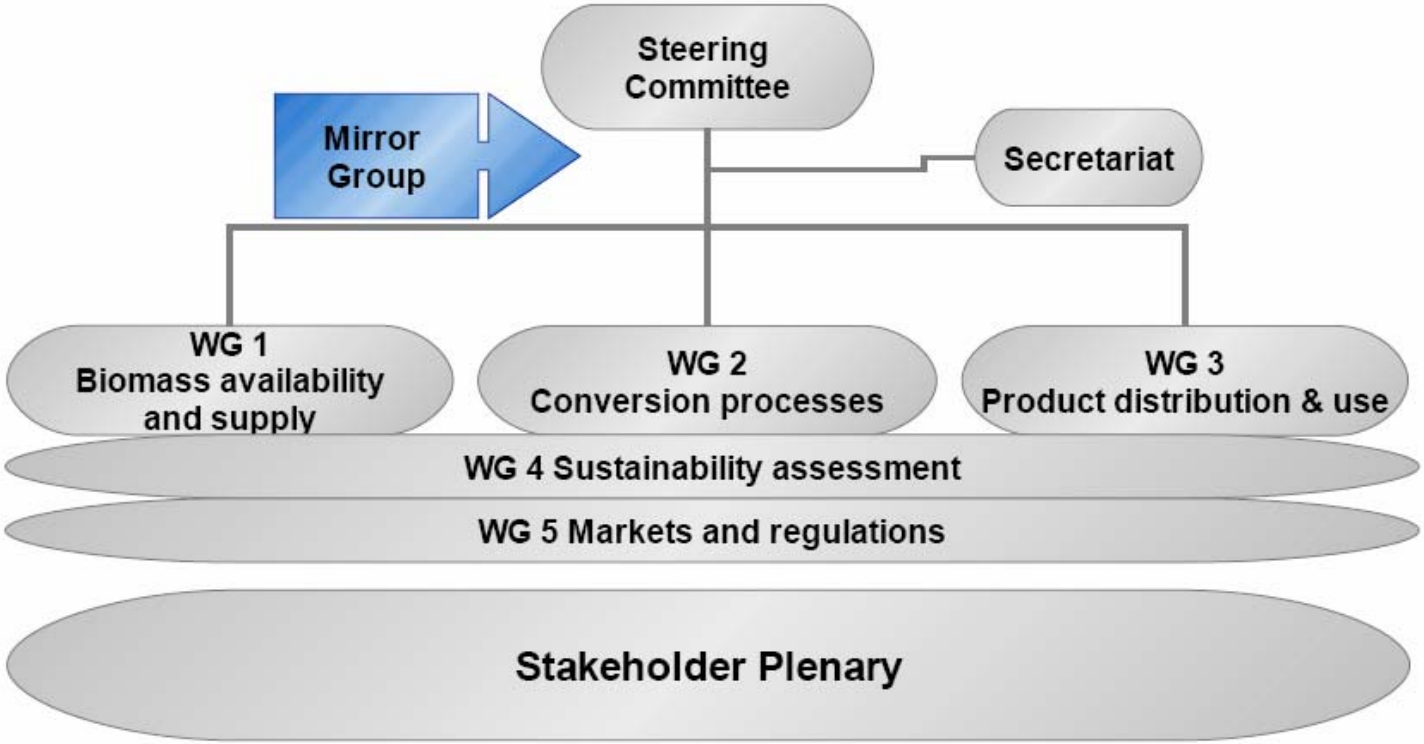
→ through a process of guidance, prioritisation and promotion of research, development and demonstration.

Vision Report June 2006 → **Strategic Research Agenda & Strategy Deployment Document January 2008** → **Facilitate Implementation**



Biofuels TP: organisation

Biofuels Technology Platform






SRA/SDD


Biofuels
TECHNOLOGY PLATFORM
European Biofuels Technology Platform
Strategic Research Agenda &
Strategy Deployment Document

SRA: Main conclusions

Three main areas of technology development are critical to ensure successful development of sustainable biofuels in the European Union:

- FEEDSTOCKS
  - managing competition for land resources (food & fodder vs. bioenergy) and for different biomass applications (transportation fuels, heat, industrial raw materials).
  - Increasing yield per hectare and developing efficient supply logistics both for dedicated crops and residues.
- CONVERSION TECHNOLOGY
  - developing energy efficient and reliable biomass-to-fuel conversion processes with feedstock flexibility and high quality product.
- LOGISTICS & END-USE TECHNOLOGIES
  - optimisation of fuel-engine environmental and energetic performance ensuring compatibility with existing and future infrastructure and vehicles.

SRA: Key R&D&D-Priorities

Biofuels Technology Platform

•FEEDSTOCKS:

✓Develop ***availability-cost curves for different sources of biomass*** (energy crops, forestry and agriculture residues, wastes) ***and geographical locations***; develop interfacing systems analysis (supply-demand, market interdependencies, impact of policies).

✓Develop ***new high-yield agricultural and forest systems*** with breeding of crops and trees ***optimised for sustainable biofuels production***.

✓Develop ***efficient biomass logistic systems*** (harvesting/collection/storage) for different conversion concepts ***at different scale***.

•CONVERSION PROCESS:

✓***Improve current conversion processes*** to their full potential (biodiesel, bioethanol from starch-sugar) ***for higher GHG reduction***, increased ***flexibility for different raw materials and lower cost***

✓Develop ***thermochemical and biological conversion processes with feedstock flexibility*** for different lignocellulosic biomass (BtL, L-C bioethanol)

✓Develop ***integrated biorefinery*** concepts making ***full use of a variety of biomass feedstocks*** to obtain diverse ***high-value bioproducts***

✓***Demonstrate*** at pilot and industrial scale ***reliability and performance*** of new technologies

SRA: Key R&D&D-Priorities

Biofuels Technology Platform

- **LOGISTICS & FUEL/ENGINE OPTIMIZATION**

- **OVERALL SYSTEM SUSTAINABILITY:**

  ✓Further develop ***indicators and coherent methodology*** to assess and monitor the ***three dimensions of sustainability: economic, environmental, social.***

  ✓***Generate and collect data*** required and ***carry out sustainability assessment*** of existing and potential promising production chains ***(land, feedstock, process, fuel use***).

SDD: Recommendations for biofuels deployment

Biofuels Technology Platform

- A ***coherent, long term and harmonised political and open market framework*** to secure confidence of investors in capital-intensive innovative technologies.

- ***Joint public/private financing*** for ***R&D and Demonstration*** of new biofuels production routes and end-use applications. ***Additional public funding for higher risk large-scale demonstration facilities.***

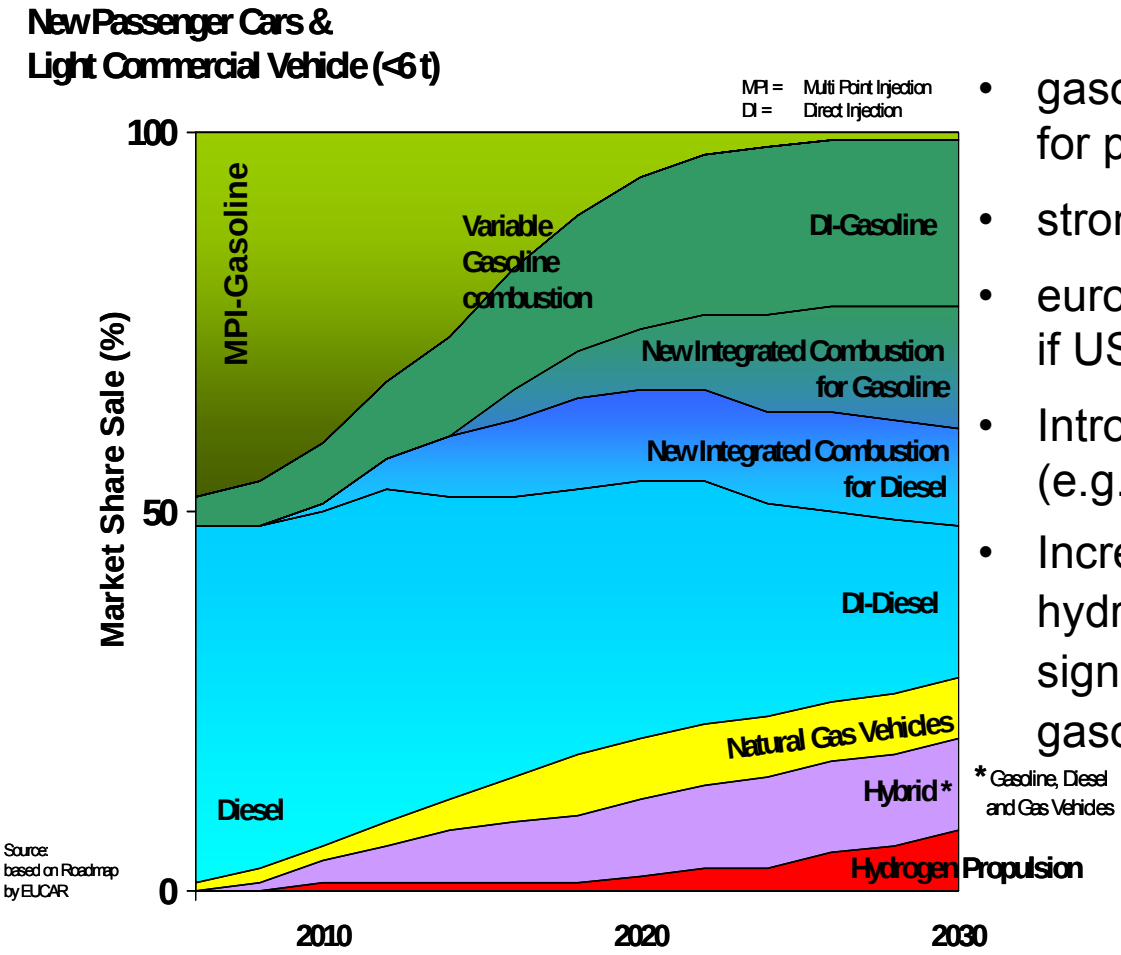
- ***Biofuels quality standards based on sound science*** while not creating unnecessary barriers for biofuel deployment.

- ***A simple, coherent and global certification system*** to ensure environmental, economic and social sustainability of biofuels production chains.

- ***Social awareness and acceptance*** gained by open communication on benefits as well as on potential limitations of biofuels.

SRA: fuels logistics & end use

Key assumptions for the fuels and powertrain demand until 2030



- gasoline and diesel engines dominating for passenger car and light duty CV
- strong diesel demand for freight transport
- european gasoline surplus might increase if USA reduces gasoline imports.
- Introduction of new combustion schemes (e.g. HCCI)
- Increasing share of hybrid, gas and hydrogen propulsion vehicles, albeit significantly lower than diesel and gasoline vehicles

→ The demand for liquid fuels will remain very strong

R&D Demand for «Fuel Distribution»

Present Status

Current biofuels generate logistics challenges, probably more than some advanced biofuels:

- Chemistry of today´s bio-components like FAME based biodiesel and ethanol increases the potential for materials incompatibility, contamination in manufacturing and transport, especially when blended at higher concentrations.
- Some future biofuels (BTL, HVO) are expected to have less impact on distribution system because of higher chemical similarity and better compatibility with fossil fuels.

→ Technical solutions to these logistics issues are mostly based on proper materials selection and fuels strict quality control at the different stages of the logistics chain.

R&D Demand

Research issues arise with increasing biofuels content, penetration of new fuel types and/or wider array of feedstocks

- SI Engine Fuels: Pipeline distribution of very high biocontent fuels
- CI and Gas Engine Fuels: Supply and distribution of biogas and H2.

End-Use in Vehicles

Issues Impacted by Fuel Property

Fuel Supply System	Engine		Exhaust Gas Aftertreatment	Vehicle
	Combustion	Mechanics		
• Long-term fuel storage • Material compatibility with fuel tank • Material compatibility with seals/gaskets • Material compatibility with hoses/pipes • Compatibility with fuel filters • Compatibility with fuel pumps • Compatibility with fuel reformer	• Engine Power • Fuel efficiency • CO2 efficiency (TTW) • Emissions • Cold startability • Hot driving performance • Noise • Compatibility with existing engine technology • Potential for improved technology • Potential for late homogenisation (diesel engine)	• Injector Cleanliness • Combustion Chamber Cleanliness • Friction • Engine Oil Compatibility • Overall reliability • Overall durability	• Oxidation Catalyst • DPF Performance • DPF Regeneration • Three-Way Catalyst • Advanced TWC • SCR catalyst • NOx storage catalyst • Sensors (λ, NOx)	• Driving Range • Health • Safety

1. Determination of Future Fuel Requirements

The impact of fuel properties on CI and SI engine and vehicle issues as described before is not yet fully known and understood. Fundamental research is essential for expanding the basic knowledge on this field to provide a basis for the definition of future fuel requirements.

2. Verification of Future Biofuel Options

The suitability of biofuels (neat or as blend) with respect to future fuel requirements according to the previous item has to be investigated.

- Investigations have to be conducted on currently known potential biofuels, like biodiesel, HVO and BTL. Compliance of these biofuels with future requirements has to be checked. Studies should consider the biofuels as neat fuel or blended to fossil diesel.
- Furthermore, focus should be set on the development of new types of biofuels with improved fuel properties.

Key R&D&D-Priorities

✓Establish conditions for ***compatibility of biofuels and biofuel blends with existing logistics***, as well as ***existing and new powertrains***; develop vehicle modifications for neat biofuels and high blends for specific market needs

✓Generate engine-fleet test data and set ***sound quality standards for biofuels***

✓Develop ***in-depth understanding of relationship between biofuel quality and engine performance for future fuel/powertrain systems*** in order to deliver superior combined performance.

SRA/SDD: Conclusions

The winning options (combination of land, feedstock, conversion processes and end products) will be those best addressing strategic and sustainability targets:

- High level of GHG reduction with sound management of other key environmental issues (biodiversity, water use, local emissions…)
- Security and diversification of energy supply for road transport
- Economic competitiveness and social acceptance

BiofuelsTP: The Way Forward

- ***Mapping of main ongoing biofuels R&D projects*** vis-a-vis the Biofuels Technology Platform Strategic Research Agenda.

- ***Focussing*** the Strategic Research Agenda on ***most critical priorities***, selected with ***sustainability based criteria***, in coherence with the European context.

- ***Actively contributing to*** shaping ***the Bio-energy Industry Initiative***.

- Developing ***communication activities and involvement of stakeholders***: thematic workshops, website etc.

- Strengthening ***collaboration with other Technology Platforms*** and with ***Member States*** (through Mirror Group).

Thank you for your attention !

Contact us

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