

European Biofuels Technology Platform

Overcoming the challenges of developing sustainable biofuels

Which R&D priorities for European stakeholders ?

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- EU Technology Platforms
- Introduction to the European Biofuels Technology Platform
- Vision Report - June 2006
- Strategic Research Agenda & Strategy Deployment Document (SRA/SDD) – January 2008
- SET Plan and the European Industrial Initiative on Bio-Energy: opportunity for SRA implementation
- Developing sustainable biofuels: facts & challenges
- The value chain approach
- Conclusion: R&D priorities and more ...

Technology Platforms are mechanisms to bring together all interested stakeholders, particularly from the private sector,

- i) to develop a **long-term Vision** for a specific technology field
- ii) to create **Research and Deployment Strategies** to achieve this Vision
- iii) to **Steer the Implementation** of this Vision

Industry-driven, wide stakeholder involvement, private-public collaboration, co-ordination and strategic alignment in the European RTD investments, communication/dissemination

Invitation EC to Biofuels Research Advisory Council (**BIOFRAC**) to develop a **Vision** for Biofuels up to 2030 and beyond (15 June 2005)

This Vision was intended to become a guidance tool for all stakeholders, by setting the framework for an **SRA** and **SDD**

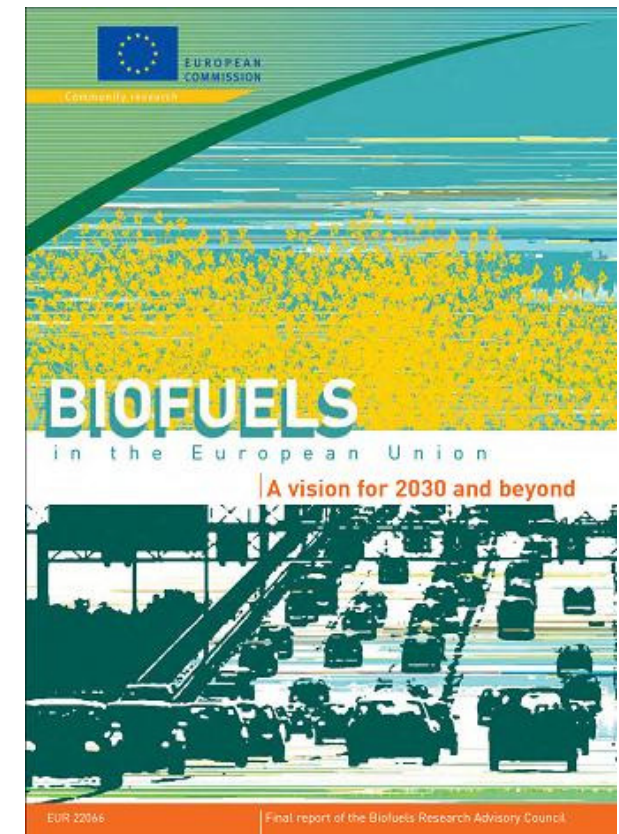
Stakeholders involved:

Industry (sugar, paper, ...), biofuel producers, fossil fuel producers and distributors, biomass associations, universities, research institutes, car & truck manufacturers, forestry industry, farmers

Biofuels in the European Union - A Vision for 2030 and Beyond

Prepared by the Biofuels Research Advisory
Council (BIOFRAC) in June 2006

- *About 1/4 of the road transport needs of the EU in 2030 is covered by biofuels*
- *A substantial part is provided by a competitive European industry*



This Vision prepared 2.5 year ago needs to be updated as a result of major international concerns (a.o. food/fuel debate, sustainability issues, feedstock availability, social perception, ...). The EBTP will come-up in **2009** with and updated **Position Paper** describing the long-term EU Biofuel Potential.

The final recommendation if the BIOFRAC was to establish a EBTP

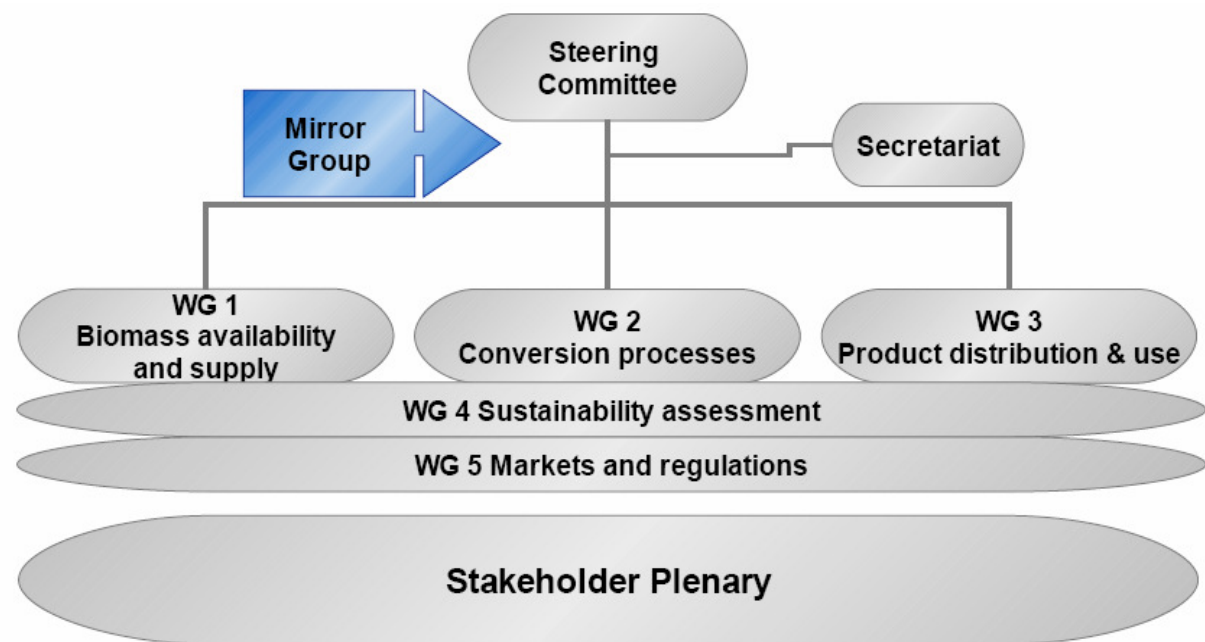
This Platform was launched on 8 June 2006 in Brussels where the 1st Steering Committee was established

Current (2008) organisation

- SC: about 20 representatives
- MG: national gov. repr.
- Secretariat
- 5 WG: about 25 repr. each
- SP: more than 500 repr.

No legal body (yet)

Active participation based on invitation and own expenses



Contributing to the development of cost-competitive world-class biofuels technologies and to the creation of a healthy biofuels industry, to accelerate the deployment of biofuels in the EU

Working programme:

- Elaboration of a **Strategic Research Agenda (SRA)** with detailed identification of key RD&D working lines for the next 10 years to achieve the 2030 Vision
- Elaboration of a **Deployment Strategy (SDD)** which anticipates the key elements required to implement the SRA
- Identification ongoing biofuels RD&D activities and stakeholders
- Stimulation of EU private-public investment in RD&D-projects
- Co-operation with other bodies engaged in biofuels RD&D
- Communication/dissemination outcomes of EBTP's activities

Published by the EBTP
in January 2008



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 & feed vs. bioenergy) and for different biomass applications (transportation fuels, heat, power, industrial raw materials for chemicals and 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 products

■ **LOGISTICS & END-USE TECHNOLOGIES**

- Optimisation of fuel-engine environmental and energetic performance ensuring compatibility with existing and future infrastructure and vehicles.

SDD: Recommendations for biofuels deployment

- ***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
- ***Biofuels quality standards based on sound science*** while not creating unnecessary barriers for biofuels 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/SDD: Conclusions

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

SET Plan & EII-Bioenergy

- **Climate Energy Policy EU:** 20% renewable energy in 2020, 10% biofuels in 2020 (30-35 Mtoe; necessary annual grow rate of 60%)

- **Strategic Energy Technology (SET) Plan** [COM(2007)723,22.11.07]
Basis for a low-carbon energy technology policy for Europe: strategic planning and new governance to align technology development with policy goals.

- The biofuel target cannot be reached with a BaU-scenario generating incremental progress. Strong political guidance and support to develop biofuel markets is needed to stimulate the deployment of new Biomass Value Chains in order to achieve goals in a sustainable way. European Industrial Initiatives are expected to play a critical role.

European Industrial Initiative on Bioenergy (EII-B) – endorsed by the Energy Council in February 2008 -> a.o. commercialization 2nd-generation biofuels in 2015 -> demonstration asap!!!

EBTP has set-up a Task Force to prepare a contribution with a focus on advanced sustainable biomass value chains, incl. biofuels, in the context of an overall strategy for bioenergy for the EII-B

Stakeholders willing to develop biofuels (and bioenergy) in Europe are facing significant challenges whose impact on the social, economic, and ecological potential of new **Biomass Value Chains** is enormous.

These challenges can be found all over the biomass value chains, within the following areas:

- Bio-feedstocks
- Processing technologies
- End markets for bioenergy
- Regulatory framework

.... facts & challenges

Bio-Feedstocks

➤ Facts

- Fragmented, highly heterogeneous → no single feedstock likely to dominate in the "European basket of biomass feedstocks"
- Competition for land and/or feedstock use
- Limited European potential on a per capita basis

➤ Challenges

- To enhance feedstock availability, lower the production cost and improve sustainability
- Realistic appreciation of sustainable biomass supply on a local/regional basis across Europe

.... facts & challenges

Processing technologies

➤ Facts

- Different types of feedstocks, different integration opportunities and policy priorities → need for a “tool box” of processing technologies
- Except for lipids, intrinsic low energy density of biomass → overall lower energy and carbon efficiency compared to fossil alternatives

➤ Challenges

- To develop technologies and pathways able to cope with variable quantities and qualities of biomass feedstocks
- To achieving energy and cost efficiency on a reliable basis – a.o. development of biorefinery processes

.... facts & challenges

End markets for biofuels

➤ Facts

- Large and increasing distillate markets for transportation (road, air, marine)
- Biofuel costs: even at high crude oil price, biofuels need monetisation of GHG and/or security of supply benefits

➤ Challenges

- To secure adequate logistics
- To be competitive with its alternatives, sustainable and in full compliance with European standards and regulations

.... facts & challenges

Regulatory framework

➤ Facts

- The economics of biofuels value chains in Europe are still dependent on the regulatory framework
- Unsettled political framework lacking coherence across Member States and policy areas: the objectives of climate, energy security environmental and agricultural policies are not always convergent and coherent in relation to bioenergy and biofuels issues

➤ Challenges

- To develop advanced processing technologies requesting high investment costs in an environment with uncertain feedstock availability & price and unpredictable regulatory framework whose impact on the economics of bioenergy is of first order.

From Development Challenges to Technical Priority

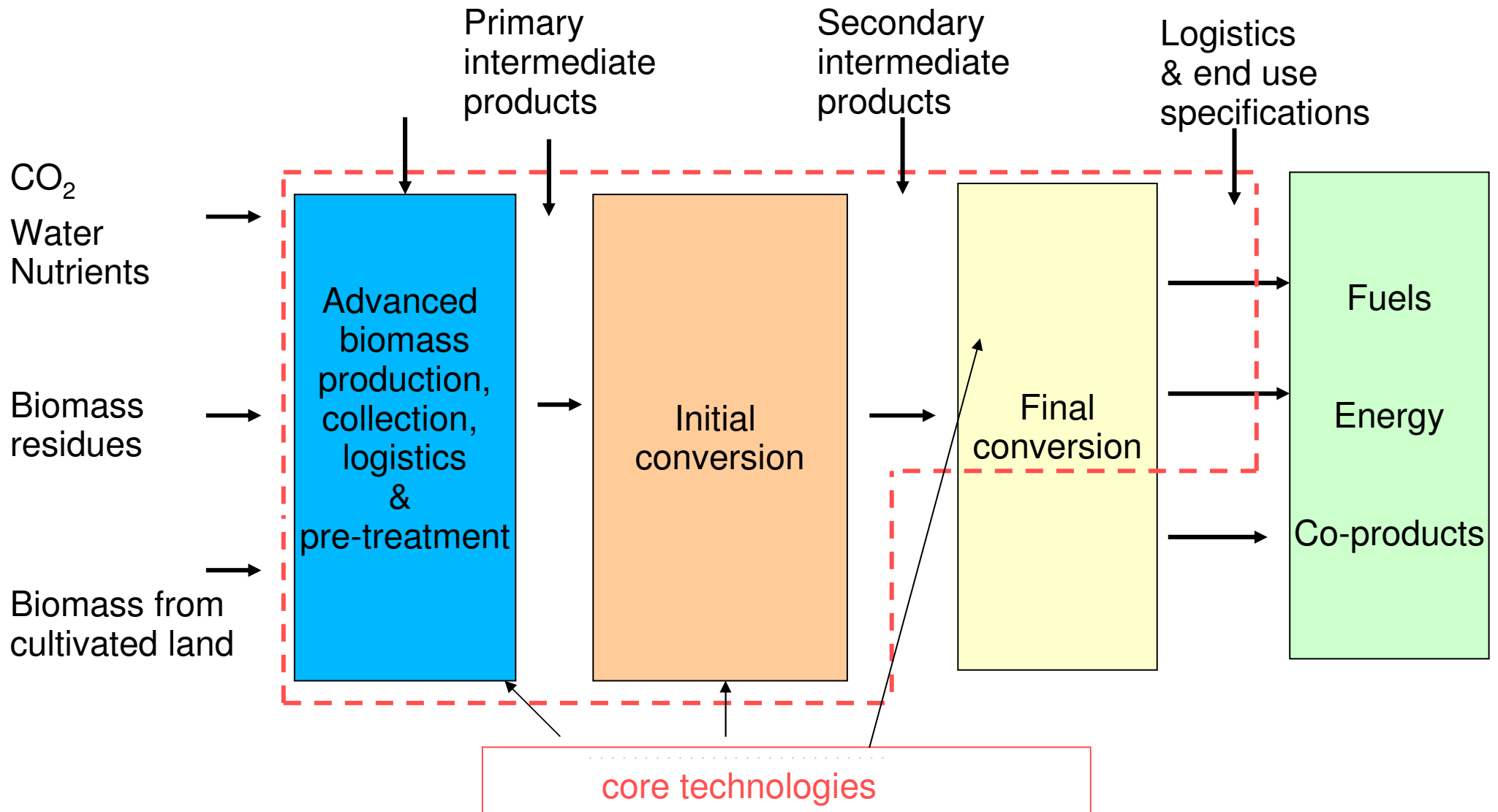
- Feedstock availability and sustainability & political (regulatory) framework are critical challenges
- Selecting technologies only on technical criteria is not an option. Local context consideration is critical.

Need for a pragmatic approach integrated over the **Whole Biomass Value Chain** to identify critical technologies and the underlying research needs

Innovative advanced biofuel value chains will be needed to meet the long-term European biofuel ambitions

- Identify most relevant innovative value chains: those suitable for supplying a significant share of the road transportation market, in a sustainable way
- For each of these value chains:
 - appraise feasibility of sustainable and competitive supply of relevant feedstocks
 - identify the critical technologies: those having a major impact on overall energy and/or carbon efficiency, capex, opex and reliability
 - appraise the status of the critical technologies within context of proposed value chain: 1 (laboratory), 2 (pilot), 3 (demonstration), 4 (industrially demonstrated and commercially available)
 - list the core technologies: those critical technologies which are specific to bio-feedstocks and/or bioenergy value chains.

The Value Chain Approach



Preliminary identification of advanced biofuels and bioenergy value chains of relevance to EII-B

- **20 value chains of potential relevance have been suggested by EBTP SC members.**
- **From this initial list 6 distinct « generic value chains » were short-listed:**
 - Ligno-cellulosic alcohols (ligno cellulose to alcohols via biological processes)
 - Ligno-cellulosic synfuels (ligno cellulose to synfuels via gasification)
 - Micro-organism based production of biofuels via lipids (algae, bacteria ...)
 - Sugar & starch chemically converted into HC:s
 - Pyrolysis based bioenergy carriers (ligno cellulose to solid, liquid and/or slurry bioenergy carriers via pyrolysis)
 - Ligno-cellulosic SNG (ligno cellulose to mainly methane via gasification)
- **Further analysis of their potential, the maturity of the core technologies and the underlying technical challenges is ongoing ...**
- **Biorefinery will be taken into account as part of the analysis**

Conclusion: R&D priorities and more ...

- ***The European ambitious goals for climate and energy policy is calling for step change innovation in bioenergy/biofuels value chains***
- ***The SET-plan based European Industrial Initiative on Bio-Energy (EII-B) is aiming at delivering such dramatic progress***
- ***Preliminary identification of Value Chains of potential relevance to EII-B is pointing to the need for further development and demonstration of critical and core technologies***
- ***Technology is not the major barrier for large-scale implementation of biofuels in the EU; feedstock availability and the political framework are***
- ***Industrial leadership backed by strong support from EU and Member States will be essential to manage the risks and secure financing***
- ***Contributions from all key stakeholders of the full biofuel value chain is needed: biomass supply, industrial deployment, research and technology development, sustainability***

2nd Stakeholder Plenary Meeting
**“Implementing the Strategic Research
Agenda on Biofuels**
—
from pilots to demonstration plants”



**22nd January 2009, Diamant Conference Centre
Brussels, Belgium**

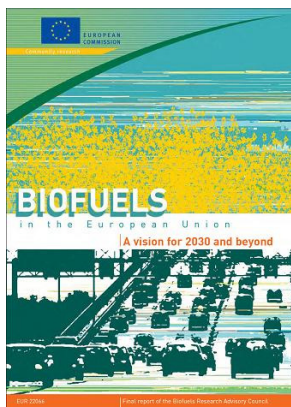
European Biofuels Technology Platform (EBTP)

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Vision Report
June 2006



Strategic Research Agenda &
Strategy Deployment Document
January 2008



Facilitate Implementation
2008 ...

