

# EU Policies for Transport Biofuels and the Strategic Research Agenda of the European Biofuels Technology Platform

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# FNR e.V. - Fachagentur Nachwachsende Rohstoffe

nachwachsende-rohstoffe.de

**Function:** Coordination of German non-food activities on behalf of the Federal Ministry for Agriculture



**Foundation:** October 1993

**Location:** Gülzow/Bützow,  
Mecklenburg-Vorpommern

**Legal status:** Registered association

**Members:** 64

**Staff:** 53

**Tasks:** R&D funding, information, advice



# Outline



- **Evolution of European policies for biofuels**
- **Current status of biofuels**
- **Strategic Research Agenda of the Biofuels TP**



# Motivation for renewable energies

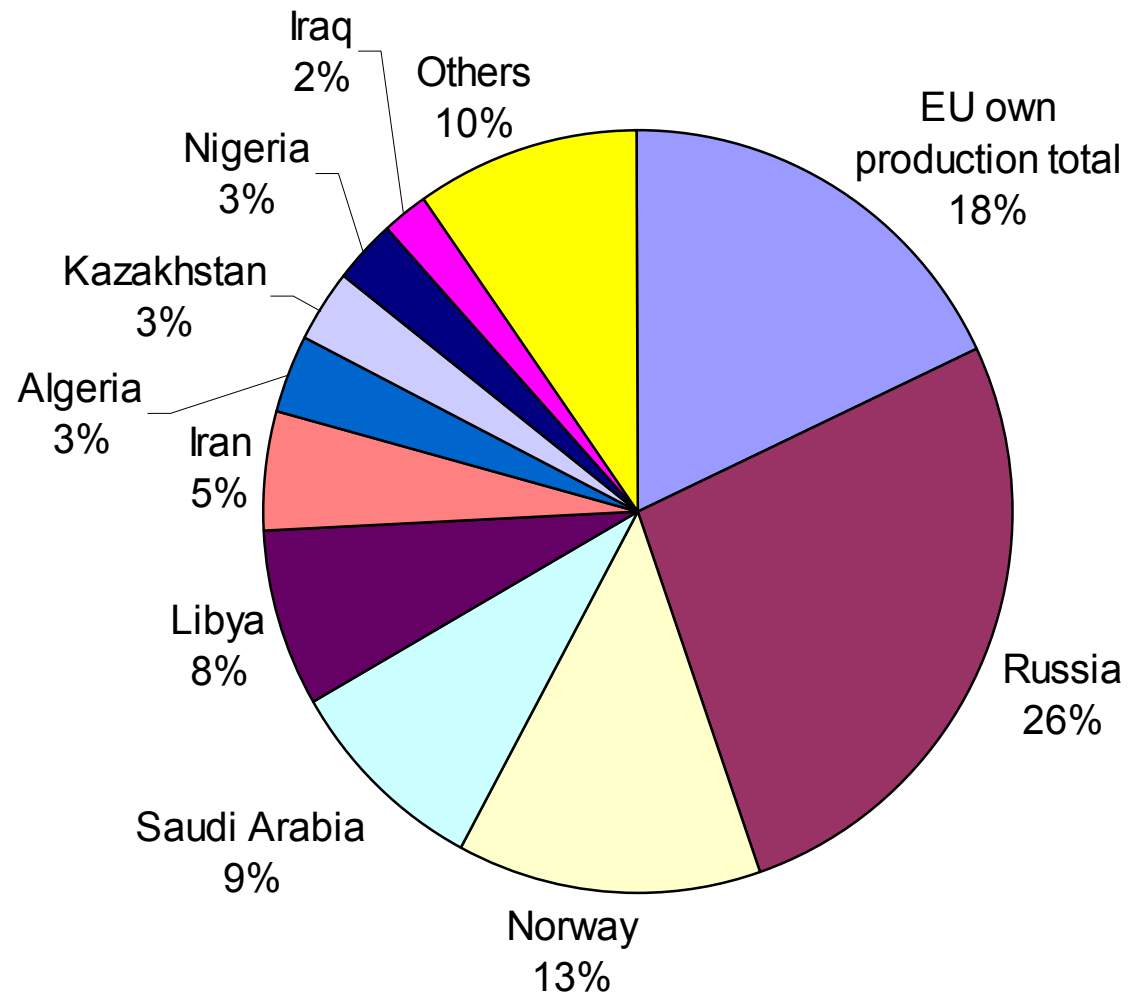
The Community has long recognised the need to further promote renewable energy given that its exploitation contributes to

- climate change mitigation through the reduction of greenhouse gas emissions,
- sustainable development,
- security of supply and
- the development of a knowledge based industry creating jobs, economic growth, competitiveness and regional and rural development

Source: EC (2008) 19: Proposal for a directive on the promotion of the use of energy from renewable resources, 23 January 2008

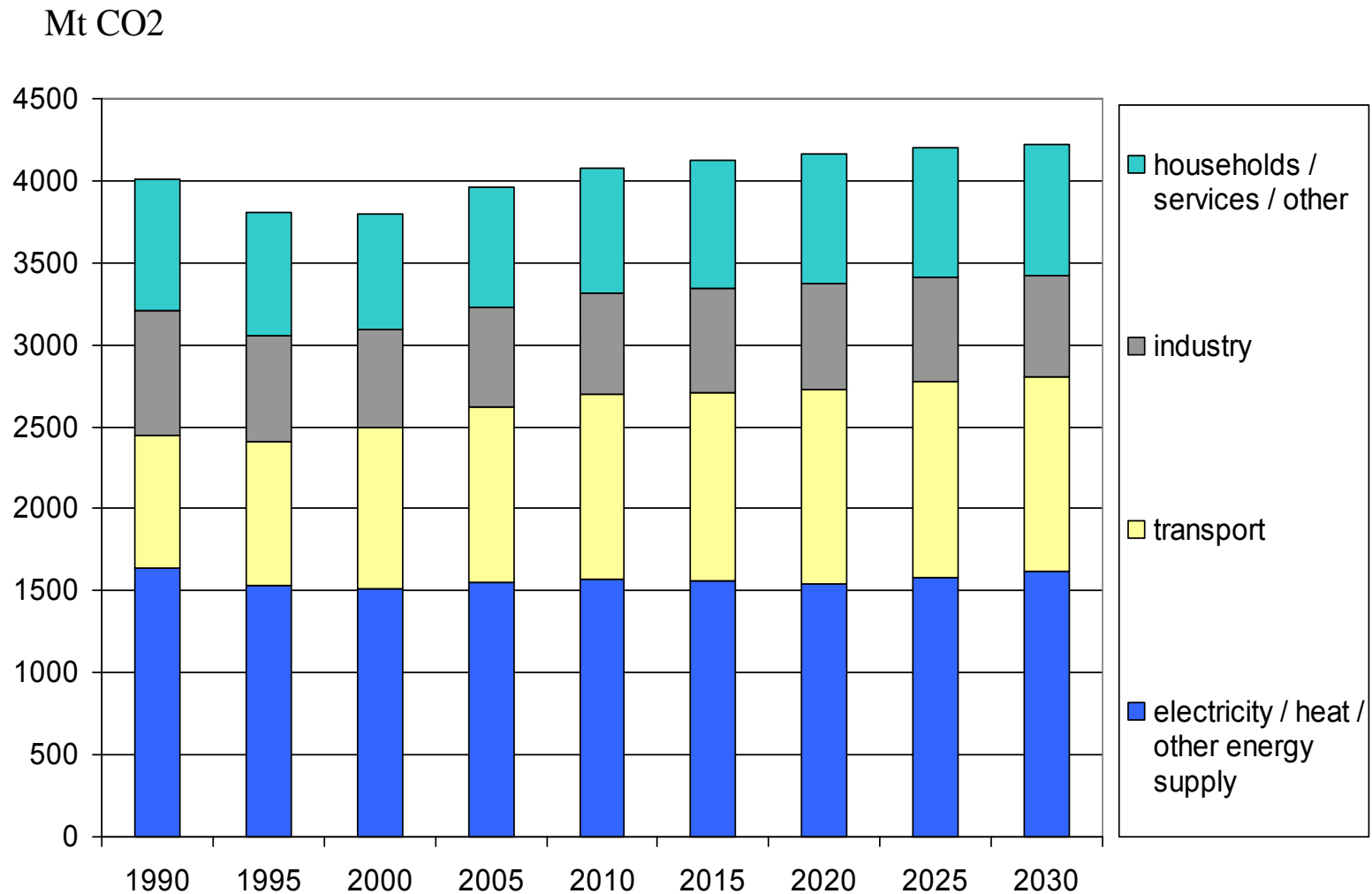


# EU-27: Origin of crude oil (2004)



Quelle: Europäische Kommission, DG TREN; Eurostat

# EU-27 energy related CO<sub>2</sub>-emissions by sector



Source: European Commission, DG TREN, Eurostat

## History:

- ▶ Non food crops on set aside tolerated
- ▶ Support of R&D&D
- ▶ Biofuel tax breaks only accepted in the frame of pilot projects
- ▶ White paper renewable energy 1997: Biofuel target 2010: 18 Mio. t
- ▶ Green paper: Towards a European strategy for energy security COM (2000) 769, 29.11.2000
- ▶ Proposal for a directive COM (2001) 547, 07.11.2001 to promote the utilisation of biofuels

- ▶ Voluntary targets but reporting obligation
- ▶ 2 % biofuels by the end of 2005 and 5,75 % by 2010 (in terms of energy content)
- ▶ Parallel directive 2003/96 EC: Better possibilities for tax breaks for biofuels

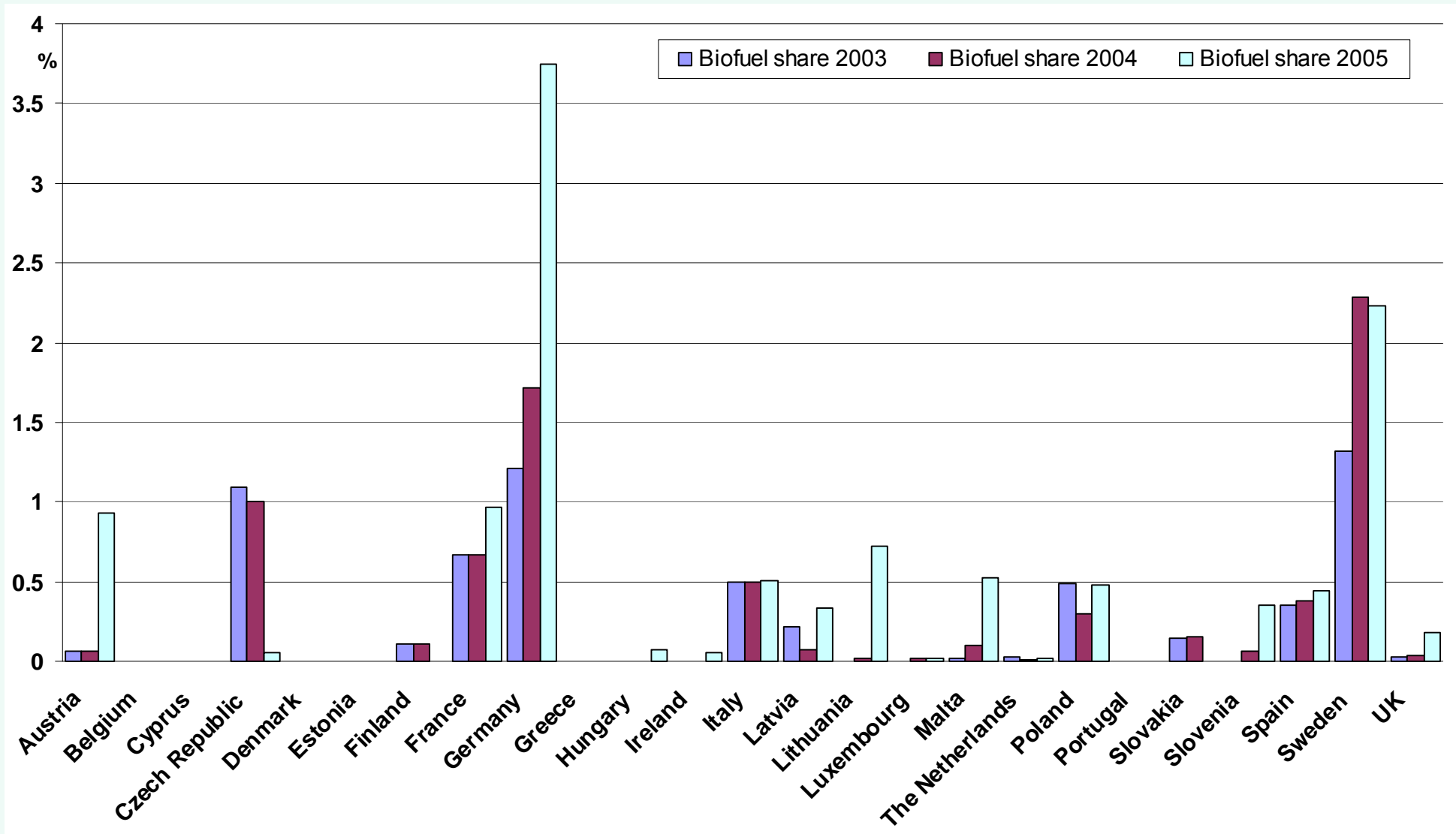
**Implementation 2005: 1 %, even national targets average only 1,4 %, only Germany and Sweden made the 2 %!**



# Biofuel consumption shares EU-25 2003-2005



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Quelle: European Commission DG TREN, Biofuels Progress Reports provided by Member States

- ▶ More bioenergy for electricity, heat and transport
- ▶ Analysis of strengths and weaknesses of biofuels
- ▶ Further measures announced
- ▶ Target: additional 18 Mio. t oil equivalent by 2010
- ▶ How to achieve the 5,75 % target for 2010?

# 08.02.2006: A EU-Strategy for biofuels (SEK (2006) 142)



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## Objectives:

- ▶ Support biofuels demand
- ▶ Exploit environmental benefits
- ▶ Develop production and distribution of biofuels
- ▶ Increase feedstock production
- ▶ Promote trade
- ▶ Support developing countries
- ▶ Promotion of R&D

- ▶ 20 % renewable energies, 10 % biofuels by 2020
- ▶ 31.01.2007/12.2.2007: COM (2007) 19: Decarbonisation strategy: New fuel standards (1% CO<sub>2</sub> p.a. 2011-2020; in total 500 Mio. t CO<sub>2</sub> bis 2020, improvement of fuel quality, higher ethanol share in gasoline, promotion of 2nd generation biofuels
- ▶ To be implemented in fuel quality directive 98/70 EC
- ▶ European Council 9 March 2007 supports mandatory 20 %/10 % targets, but condition for biofuels: cost efficient, sustainable, 2nd gen commercially available, fuel quality directive changed
- ▶ Strategic Energy Technology Plan (SET), 22.11.2007 including measures for biofuels



# Renewable energy directive, 23.01.2008

- **Overall binding target for renewable energy consumption of 20 % by 2020, „burden sharing“ between Member States**
- **National action plans requested by 2010**

## **Biofuels :**

- 10 % mandatory target for renewable fuels per Member State
- Introduction of diesel blends with 7% biodiesel (2010) and 10% biodiesel (2014)
- Member States to give a **bonus in their biofuel**



# Renewable energy directive, 23.01.2008

## Sustainability criteria for biofuels :

- GHG savings – minimum of 35%
- No raw material from undisturbed forests, biodiverse grassland, nature protection areas
- No conversion of wetlands and continuously forested areas for biofuel production (to protect carbon stocks)
- All EU biofuels must meet “cross compliance” environmental rules





# Renewable energy directive, 23.01.2008



- **Consequences of not meeting the criteria:**
  - Biofuels do not count towards targets
  - Not eligible for national biofuel obligations
  - Not eligible for tax exemptions and similar financial support
- **Verification of compliance:**
  - Responsibility of Member States
  - To reduce the administrative burden, Commission can decide that “certification schemes” give reliable proof of compliance
  - If so, all Member States have to accept these certificates as proof

# Outline



- Evolution of European policies for biofuels
- **Current status of biofuels**
- Strategic Research Agenda of the Biofuels TP

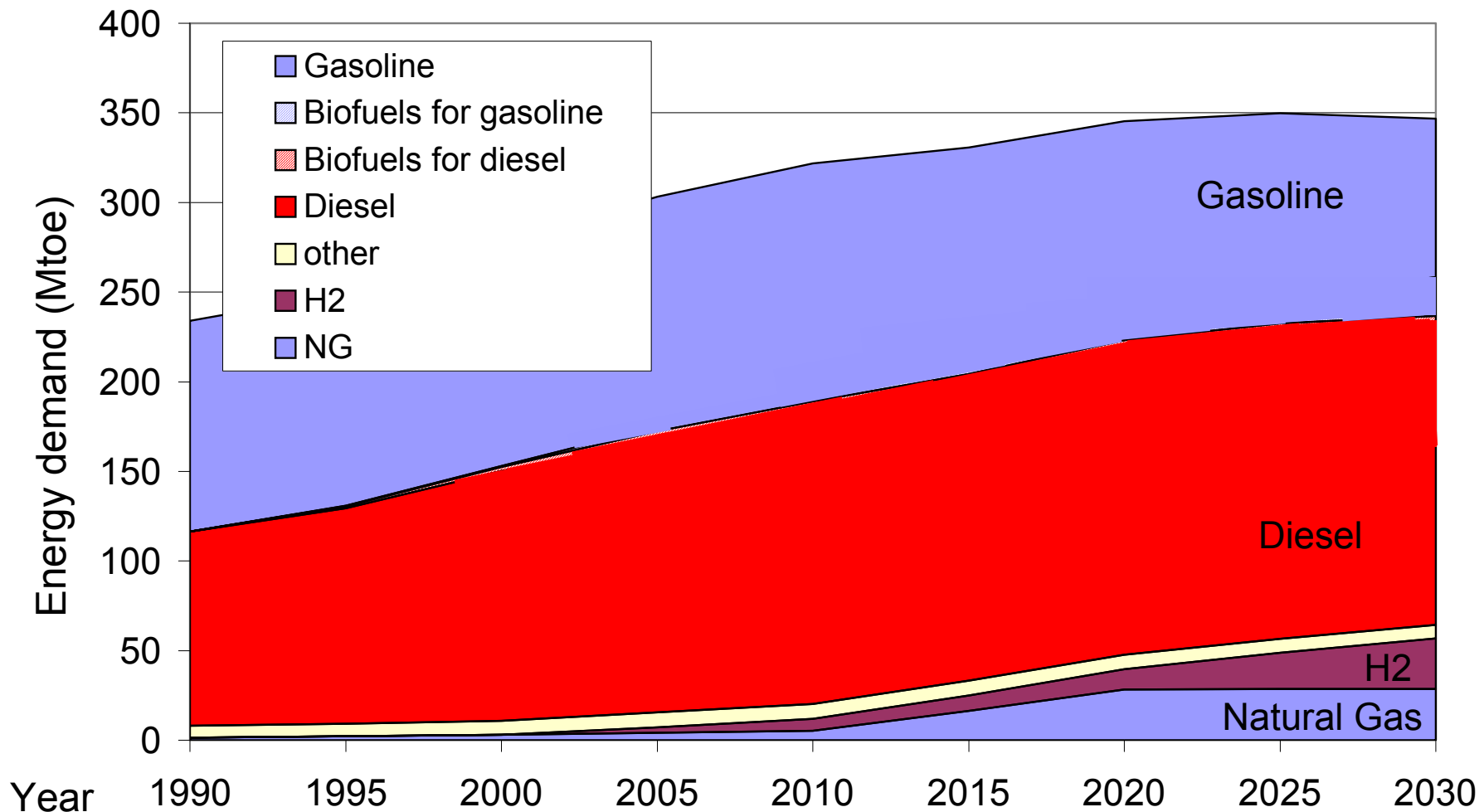
- ▶ 2006 biofuel consumption 5.38 mtoe, 1.8 % of road transport
- ▶ 3.85 mtoe biodiesel, 0.88 mtoe bioethanol, 0.65 mtoe others
- ▶ Uneven consumption between Member States
- ▶ 10 % in 2020 amounts to 34.6 mtoe
- ▶ Increasing criticism already at current consumption levels
- ▶ JRC Dec 2007 on 10 % target: GHG, security of supply, employment effects as well as cost benefit analysis negative



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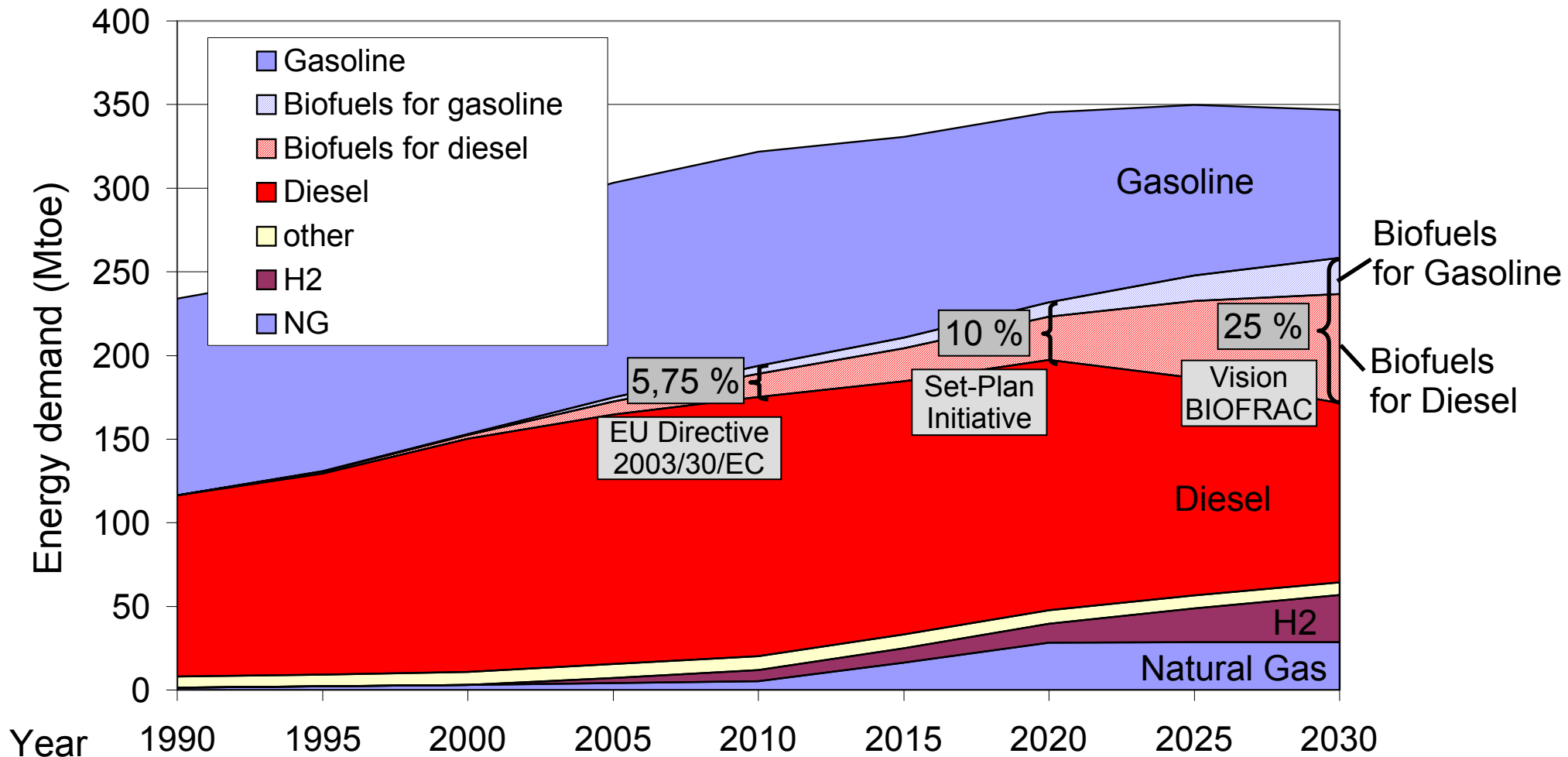
## Fuel Roadmap

The fuel roadmap until 2030 was viewed for learning which types of fuels will be demanded in future on the european market.



# Fuel Roadmap

Reasonable potential biofuel shares were worked out by WG3.





- **Three main areas of technology development are critical to ensure successful development of biofuels in the EU:**
  - **Feedstock:**
    - ✓ managing competition for land resources (food&fodder vs bioenergy) and for different biomass applications (transportation fuels, heat, power, industrial raw materials)
    - ✓ Increasing yield per hectare and developing efficient supply logistics both for dedicated crops and residues
  - **Conversion technologies:**
    - ✓ developing energy efficient and reliable biomass-to-fuel conversion processes with feedstock flexibility and high quality product
  - **End-use technologies:**
    - ✓ optimisation of fuel-engine environmental and energetic performance ensuring compatibility with existing and future infrastructure and vehicles
- **The winning options (combination of land, feedstock, conversion and end product) 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

## • 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 biofuel production
- ✓ Develop efficient biomass logistic systems (harvesting/collection/storage) for different conversion concepts at different scales

## • Conversion processes:

- ✓ 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

- **Fuel/engine optimisation:**

- ✓ **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.**

- ✓ **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).**

## **Level 1** "Competition for land, leakage effects, increasing commodity prices"

### R&D-Needs (Examples)

- 1.1 Methods and approaches to reduce competition
- 1.2 Measurement methods
- 1.3 Impact monitoring

## **Level 2** "Sustainable feedstock production"

### R&D-Needs (Examples)

- 2.1 Improvements in agricultural and forestry production
- 2.2 Better biomass provision

**Level 3** "Sustainable conversion technologies with decreased fossil inputs, less emissions, and new by-products with a huge market potential"

R&D-Needs (Examples)

- 3.1 Improvements in conversion technology
- 3.2 Integrated conversion systems / biorefinery

**Level 4** "End use: Provision of fuels matching more demanding engine specifications and meeting improved environmental standards"

R&D-Needs (Examples)

- 4.1 Identify most promising end-use options
- 4.2 Better integration of fuel, engine and vehicle

### **Level 5 "Overall chain sustainability: Viewpoint from Cradle to Grave"**

#### R&D-Needs (Examples)

- 5.1 Further development of indicators, methods
- 5.2 Assessment and monitoring
- 5.3 Improvement of sustainability aspects

### **Level 6 "Policy measures & Research for biofuels deployment"**

#### R&D-Needs (Examples)

- 6.1 Chain certification systems
- 6.2 Impact-adaptive incentives



# 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 biofuel production routes and end-use applications. Additional public funding for higher risk large-scale demonstration facilities**
- **Biofuel quality standards which are based on sound science while not creating unnecessary barriers for biofuel deployment**
- **A simple, coherent and global certification system to assure environmental, economic and social sustainability of biofuel production chains.**
- **Social awareness needs to be increased and social acceptance gained by open communication of benefits as well as potential drawbacks of biofuels**

# Conclusions

- 10 % target is ambitious and will require huge R&D and investment efforts
- Political and social support for biofuels will depend on proof of sustainability
- Sustainability has to be addressed throughout the overall provision chain and especially within agriculture and/or forestry
- If sustainability issues are adequately addressed biofuels can make an important contribution to a more sustainable energy system as a whole

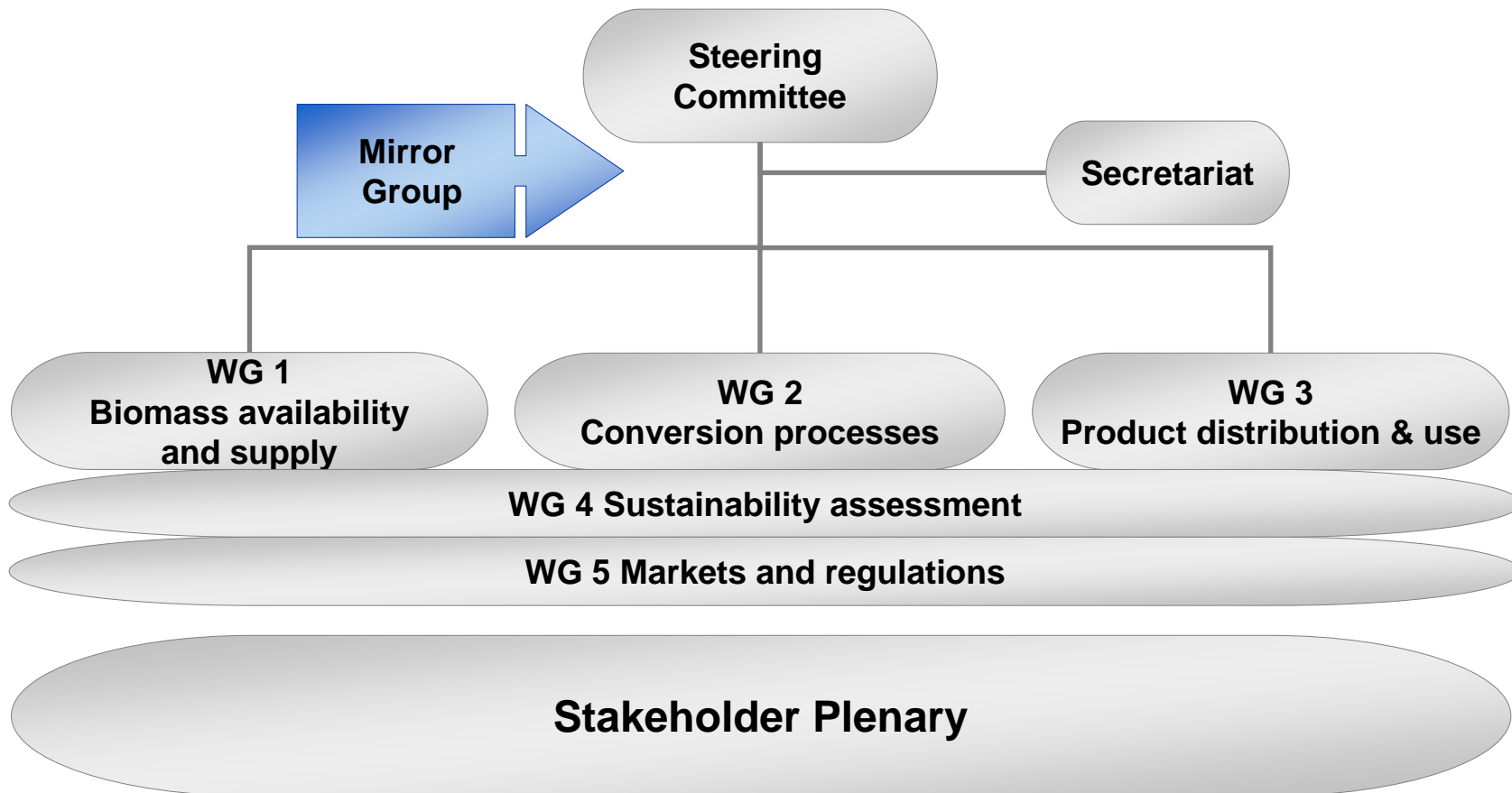
# Thank you!

Contact us

**Secretariat:** [secretariat@biofuelstp.eu](mailto:secretariat@biofuelstp.eu)

**Web page:** [www.biofuelstp.eu](http://www.biofuelstp.eu)

# Biofuels Technology Platform Organisation



# Biofuels Technology Platform: Stakeholder involvement

