


Biodiesel in Germany

History and perspectives

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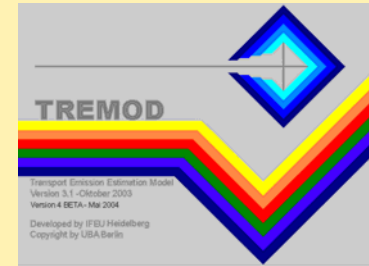
National Workshop: Biodieselchains

Sofia, 14 July 2006

A vertical photograph on the left side of the slide shows a scenic view of Heidelberg. In the foreground, there are lush green trees. In the middle ground, a river flows through the town. In the background, the Heidelberg Castle is visible on a hillside, surrounded by more greenery.

IFEU - Institute for Energy and Environmental Research Heidelberg, since 1978

- **Independent scientific research institute**
- **organised as a private non profit company with currently about 40 employees**
- **Research / consulting on environmental aspects of**
 - **Energy (including Renewable Energy)**
 - **Transport**
 - **Waste Management**
 - **Life-Cycle-Analyses**
 - **Environmental-Impact- Assessment**
 - **Renewable Resources**
 - **Environmental Education**



TREMOD: Transport Emission Model

- **Modelling emissions of road vehicles, trains, ships and airplanes**
- **Official database of the German Ministries for emission reporting**

Life cycle analyses (LCA) and technology impact assessments since 1990:

- **Biofuels (all biofuels, all applications)**
- **Alternative transportation modes (Fuel cells, FFV, etc.)**
- **Renewable Energy**

IFEU - Institute for Energy and Environmental Research Heidelberg, since 1978

- **Our clients (on biofuel studies)**

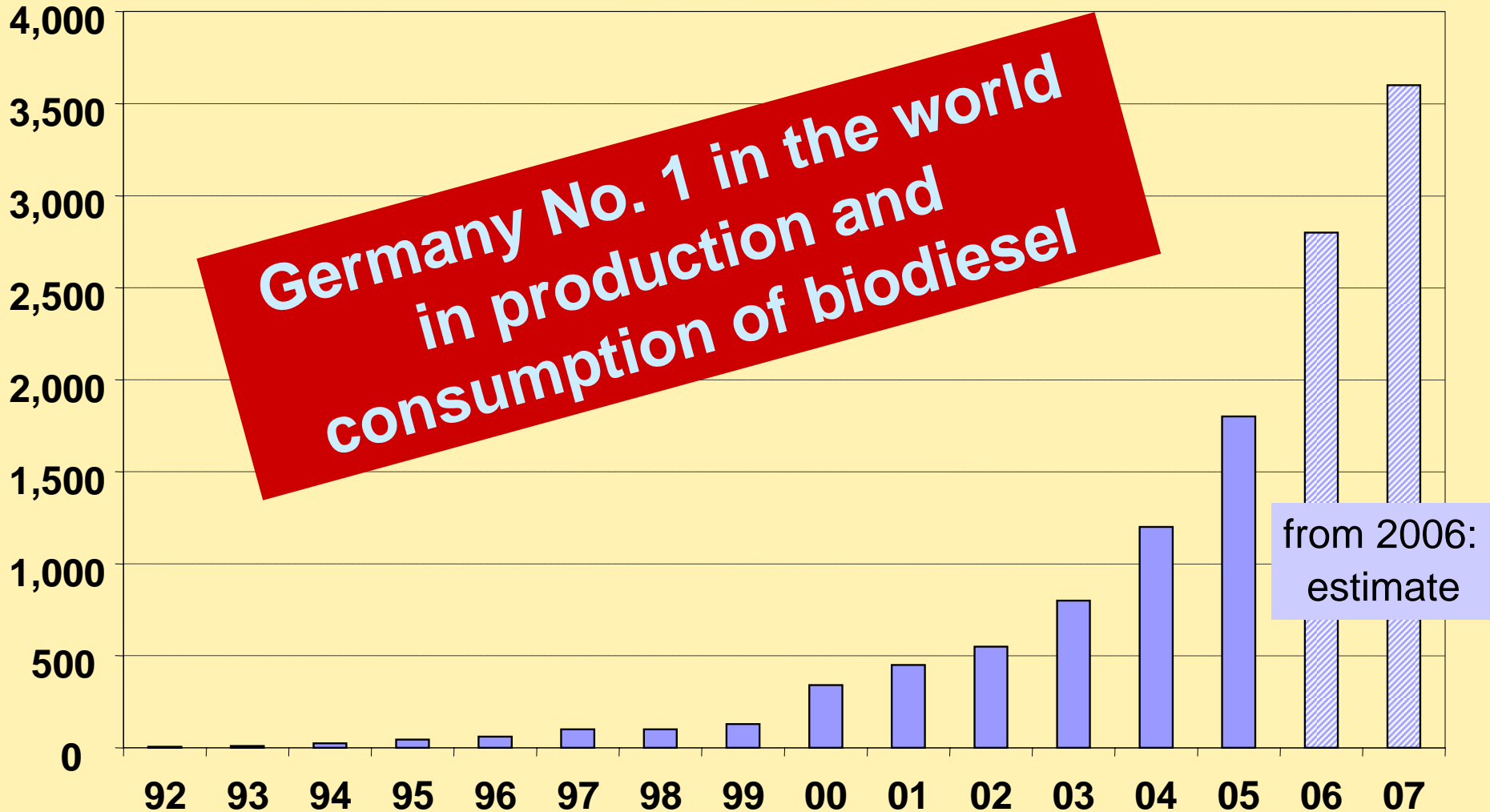
- World Bank
- UNEP, GTZ etc.
- European Commission
- National and regional Ministries
- Associations (industrial, Life-Cycle-Analyses)
- Local authorities
- WWF, Greenpeace etc.
- Companies (DaimlerChrysler, German Telekom, etc.)
- Foundations (German Foundation on Environment, British Foundation on Transport etc.)



Consumption of biodiesel in Germany



thousand tonnes



Source: IFEU 2006

What happened yesterday in Germany ?

Bottlenecks in Germany

- Taxation issues
- **Technical issues**
- Biodiesel quality
- Life cycle assessment



What happened yesterday in Germany ?

Bottlenecks in Germany

- Taxation issues
- Technical issues
- Biodiesel quality
- Life cycle assessment



What happened yesterday in Germany ?



Bottlenecks in Germany

- Taxation issues
- Technical issues
- ➔ **Biodiesel quality**
- Life cycle assessment

Measures

- Tax exemption
- Biodiesel approvals (partly)
- Norm EN 14214
- Assoc. for quality management

Biodiesel quality in Germany

Association for the Quality Management of Biodiesel (AGQM)



- Founded in 1999
- Guaranteeing quality requirements for biodiesel in the whole production/consumption chain
- Members: producers, traders, filling stations, constructors, etc.

Biodiesel quality in Germany



Important differences between the Norm and AGQM standard

Property	EN 14214	AGQM
Water content (mass ratio)	max. 500 mg/kg	Producers: max. 220 mg/kg, all members: max. 300 mg/kg
Total contamination (mass ratio)	max. 24 mg/kg	max. 20 mg/kg
Oxidation stability (induction time)	min. 6 h	min. 6 h (check point: final user) Biodiesel sold at public filling stations requires addition of oxidation stabilisers.
Period for production of winter quality biodiesel	16/11 until 28/02	19/10 until 28/02
Fatty acid profile	–	like rapeseed (for selling at public filling stations)

- **What happened yesterday?**

→ The situation of today

- **What will come tomorrow?**

Biodiesel consumption 2005:

- **Fleets** ➤ 53 % via companies' and public filling stations
- **Private consumers** ➤ 14 % via public filling stations
- **Blending** ➤ 33 % are used for blends

Driving forces

➤ Costs

Beispielrechnung für Ihren Fuhrpark :

Ermitteln Sie selbst das Sparpotential für Ihren Fuhrpark!

In den weißen Feldern haben wir typische Werte für den Ölwechsel - wie sie Mercedes und MAN vorschreiben.

Alle Ausgangswerte können Sie individuell anpassen. Für Fragen zu diesem Vergleich stehen wir Ihnen gerne zur Verfügung.

Für eine korrekte Berechnung geben Sie bitte die Werte mit einem Punkt (.) als Trenner an und verwenden Sie die richtige Einheitenangabe.

Anzahl der Fahrzeuge :

jährliche Laufleistung :

Kraftstoffverbrauch min. Diesel :

Ölwechsel nach km (normal) :

Ölwechsel nach km (verkürzt) :

Menge Öl pro Ölwechsel :

Tages-Einstandspreis min. Diesel (30.000 l)* :

Tages-Einstandspreis Biodiesel (30.000 l)* :

Einstandspreis Motoröl :

Einstandspreis Ölfilter :

Arbeitszeit für einen Ölwechsel :

Arbeitskosten für eine Werkstattstunde :

worst-case Mehrverbrauch :



120000	km / Fahrzeug
32	Liter / 100 km
100000	km
30000	km
34	Liter
85	cent / Liter *
73	cent / Liter *
2.50	Euro / Liter
15.00	Euro / Stück
1	Stunde(n)
35.00	Euro
6.0	%

Courtesy of IWR

Endergebnis ausgeben !

* Die angegebenen Preise dienen lediglich zur Verdeutlichung der Preisdifferenz und stellen kein Angebot dar.

Driving forces

➤ Costs



Courtesy of IWR

➤ Image



Courtesy of RWZ Rhein-Main



Courtesy of energieroute.de



Guinness Book of Records

Certificate

GUINNESS BOOK OF RECORDS confirms after thorough examination the record:

Europe's first rapeseed lorry is running on biodiesel (100% rapeseed oil methyl ester) for Willi Heineking from Landesbergen (D). On 26 March 1999 the 360 HP MAN-Büssing lorry (type 19360) had travelled exactly 1,333,333 km.

Hamburg, 09/08/1999

Approvals for biodiesel use

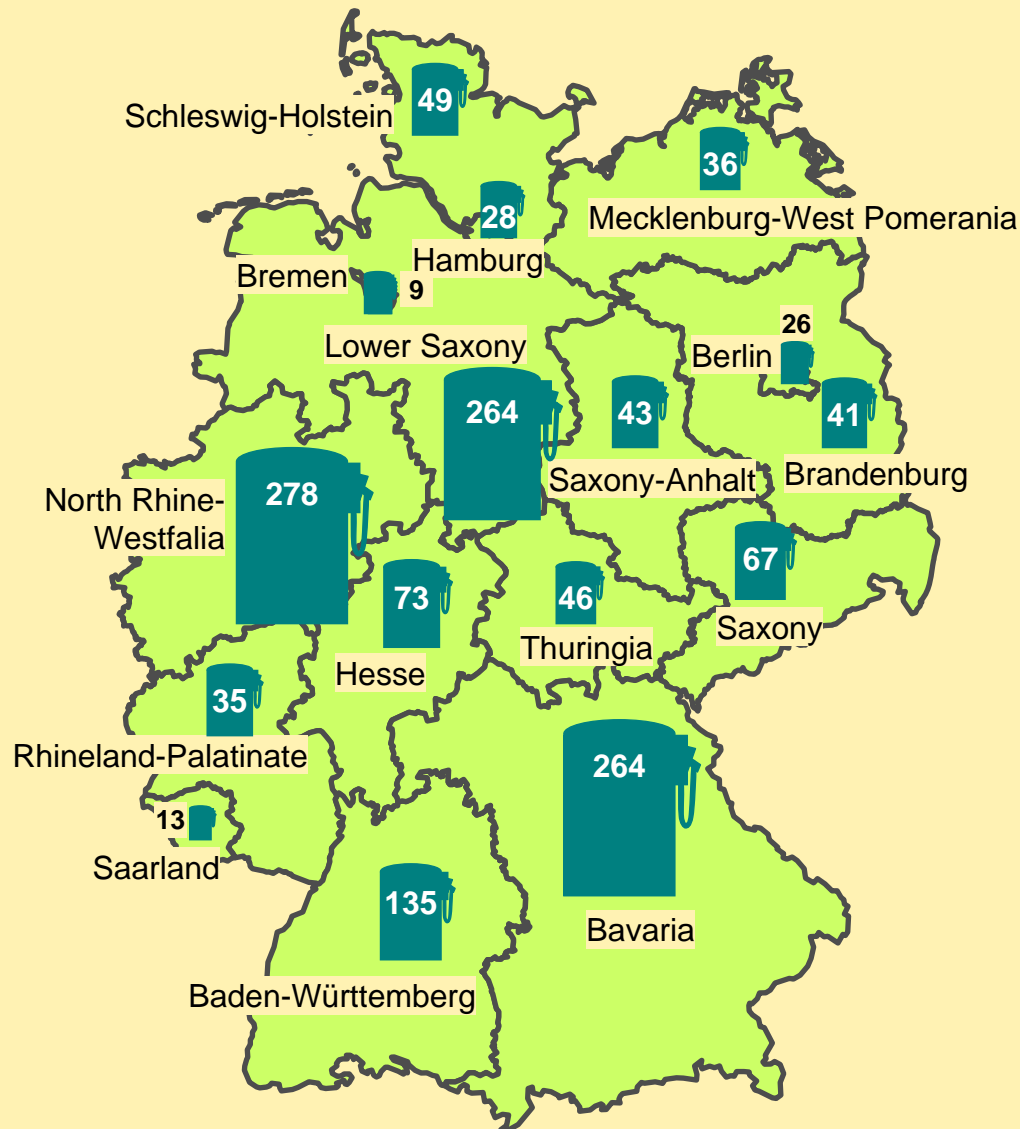


Manufacturer Model	Biodiesel approval
Audi A2 (8Z), A3 (8L), A4 (8E, 8E2, 8E5) except 85 kW, A4 Cabriolet (8H), A6 (4B), Allroad (4B)	approval for RME, possible malfunctioning of the auxiliary heating system or exclusion of its use
Audi A3 (8P)	no general approval (only specific models)
Audi A4 (8E) 85 KW; A4 (8EC, 8ED); A6 (4F); A8 (4E)	no approval
BMW	no approval
DaimlerChrysler	no approval ex works
Deutz all engines except for 909, 910, 1015, 2015	approval if biodiesel according to EN 14214
Fendt all tractors	approval , compliance with EN 14214
EvoBus Setra OM 457HLA/LA, OM 501/502 LA, OM 906 LA buses	approval
Linde all forklifts from 1.2 to 8 t load	
MAN engines with Common-Rail system	
MAN others	approval according to EN 14214
Neoplan Bus engines with Common-Rail system	
Neoplan Bus other engines	no general approval, only biodiesel according to EN 14214
Opel	no general approval
Still (for different loads)	approval
VW Golf (A03) (except Post Polo), Golf Vento (A3), Golf Ecomatic (A3), Passat (B4), Passat (B5) without particulate filter, Sharan, T4, T5, LT – 2, Caddy II Wirbelkammer and SDI, TDI, Polo Classic, Lupo, Bora, Beetle, Phaeton V10 TDI, Touareg R5 TDI and V10 TDI	approval if RME according to EN 14214
VW Golf (A5)	approval only if ordering optional RME version
VW Touran	no approval

But.....: no approvals at all for all new models of passenger cars

The situation of today

AGQM-Biodiesel filling stations in Germany



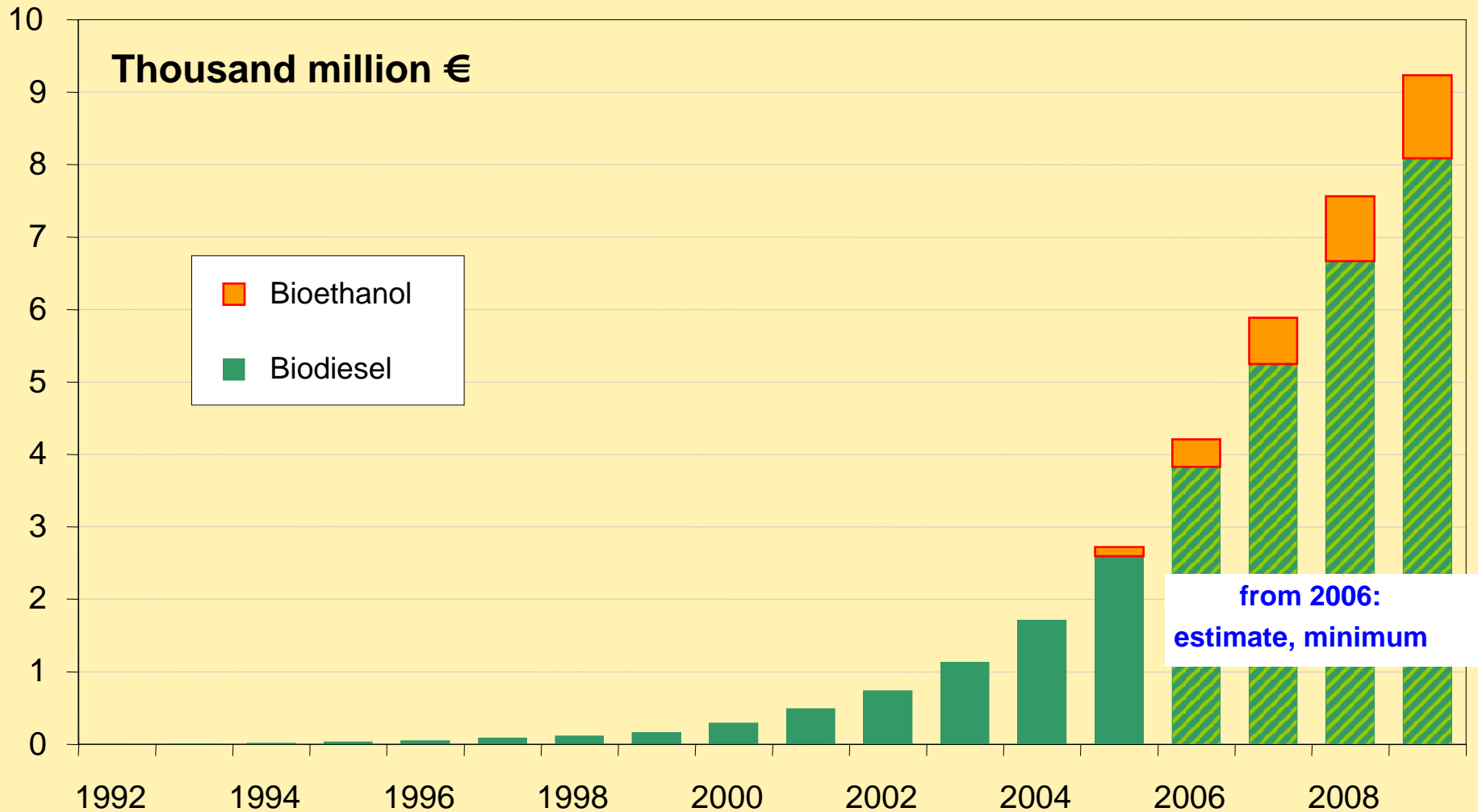
Status 2005:

**about 1,900 (i.e. 12%)
public filling stations
offer biodiesel**

**1,406 offer AGQM-
biodiesel**

Biofuels in Germany

Cumulated revenue loss through mineral oil tax exemption



Dual concept for biofuels

Already decided

**Tax on biofuels
from 08/2006**

**Obligatory blending
from 2007 ?**

- **Parliament decision
29/06/06:**
 - Stepwise increasing tax on biodiesel, biodiesel blends and plant oil
 - Other biofuels tax-free
 - Tax exemption for agriculture and forestry

- **Proposal by Federal
Ministry of Finance:**
 - Diesel 4.4 %
 - Petrol 2 % (2010: 3%)
 - Overall quota: 5.7% from 2009 (6 % in 2010)

Tax on biofuels:

■ Pure biodiesel:

- 9 ct/L 01/08/06 – 2007
- 15 ct/L in 2008
- 21 ct/L in 2009
- 27 ct/L in 2010
- 33 ct/L in 2011
- 45 ct/L in 2012

■ Biodiesel blends:

- 15 ct/L until 31/12/06
47,04 ct/L from 2007

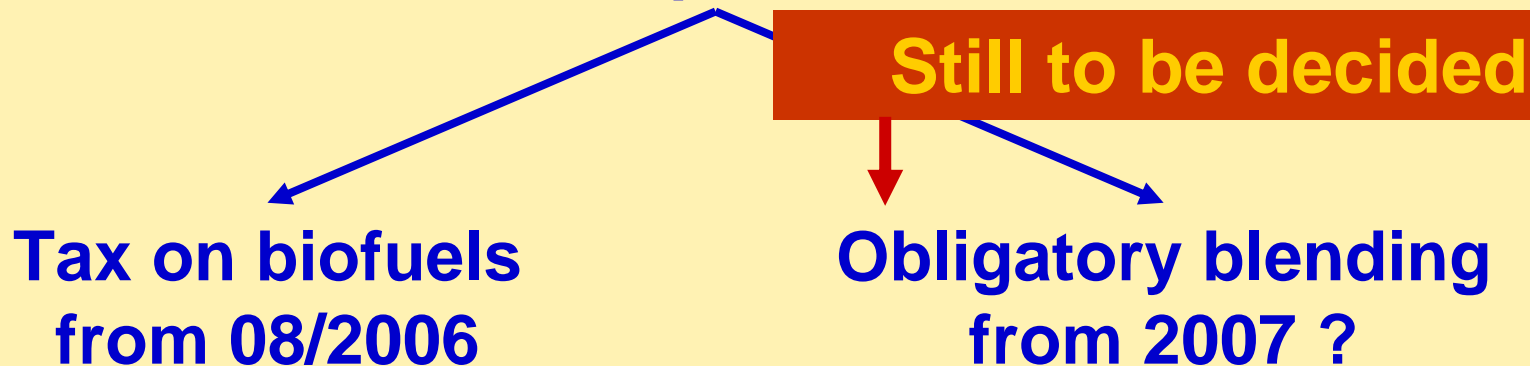
■ Pure plant oil:

- 0 ct/L in 2006 & 2007
- 10 ct/L in 2008
- 18 ct/L in 2009
- 26 ct/L in 2010
- 33 ct/L in 2011
- 45 ct/L in 2012

■ Tax exemption for agriculture & forestry

■ Ethanol/ETBE tax-free!

Dual concept for biofuels



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Biofuels demonstration in Berlin

**Big challenge
in Germany !**



band
nd Regen
Treibstoff
org



Consumption of biodiesel in Germany



thousand tonnes



from 2006:
estimate

Source: IFEU 2006

Last but not least



→ **Thank you very much for your attention and I'm happy to answer your questions any time**