



Bundesministerium für  
Ernährung, Landwirtschaft  
und Verbraucherschutz

# German National Programme on Bioenergy

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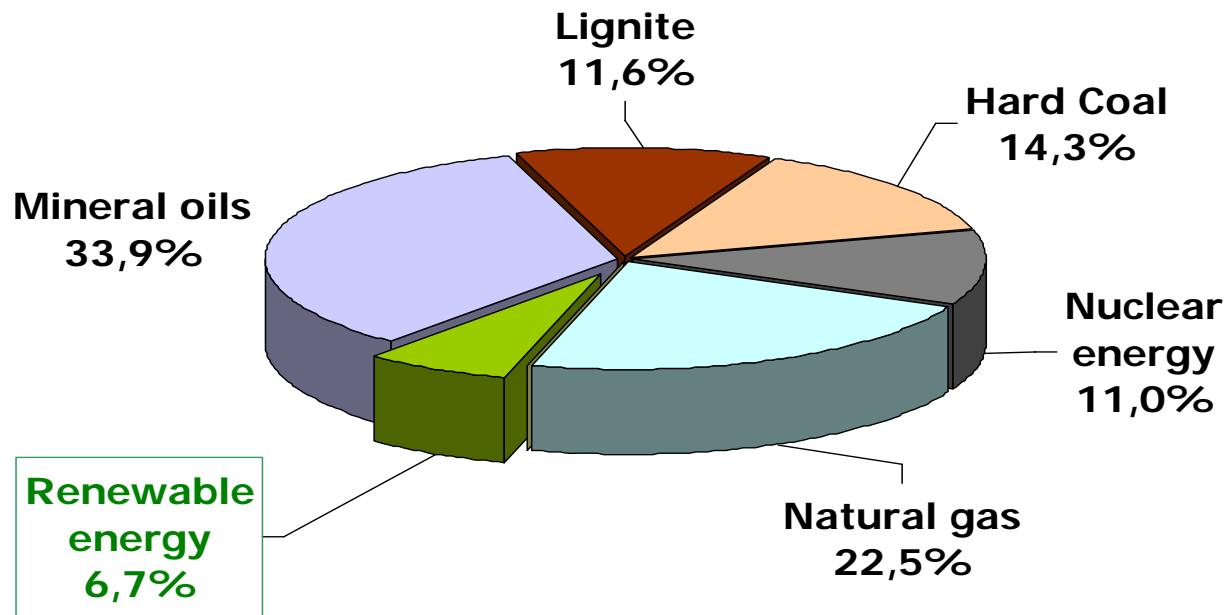
**Federal Ministry of Food, Agriculture and  
Consumer Protection**

## Outline

- Current bioenergy use in Germany
- Potentials
- Government targets and measures
- Bioenergy research highlights

# Composition of primary energy in Germany (2007)

Total: 13.878 PJ => ~ 3.855 TWh

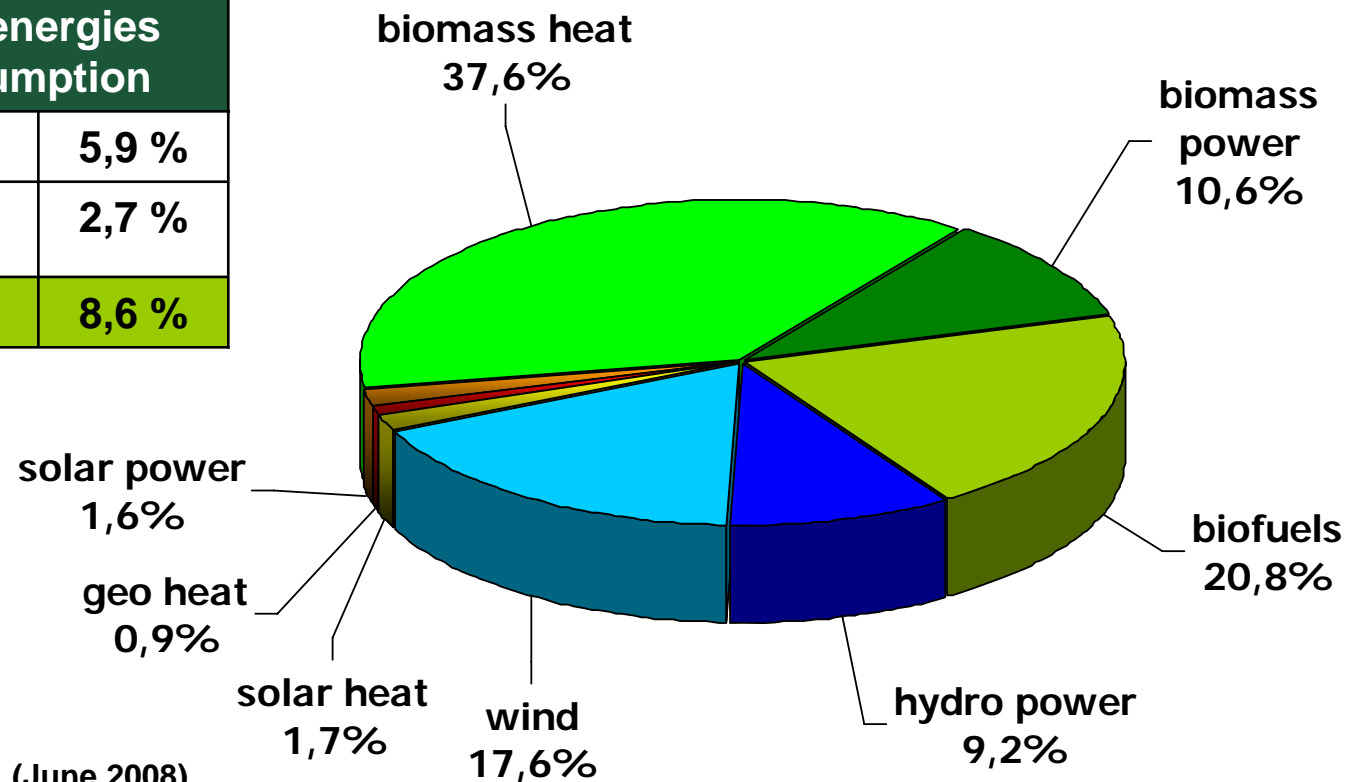


Source: BMU / AGEE Stat, (June 2008)

# Renewable energies in Germany (2007)

Total: 224 TWh -> 69 % Bioenergy

Share of renewable energies in final energy consumption	
Bioenergy:	5,9 %
Other renewables:	2,7 %
<b>Total:</b>	<b>8,6 %</b>

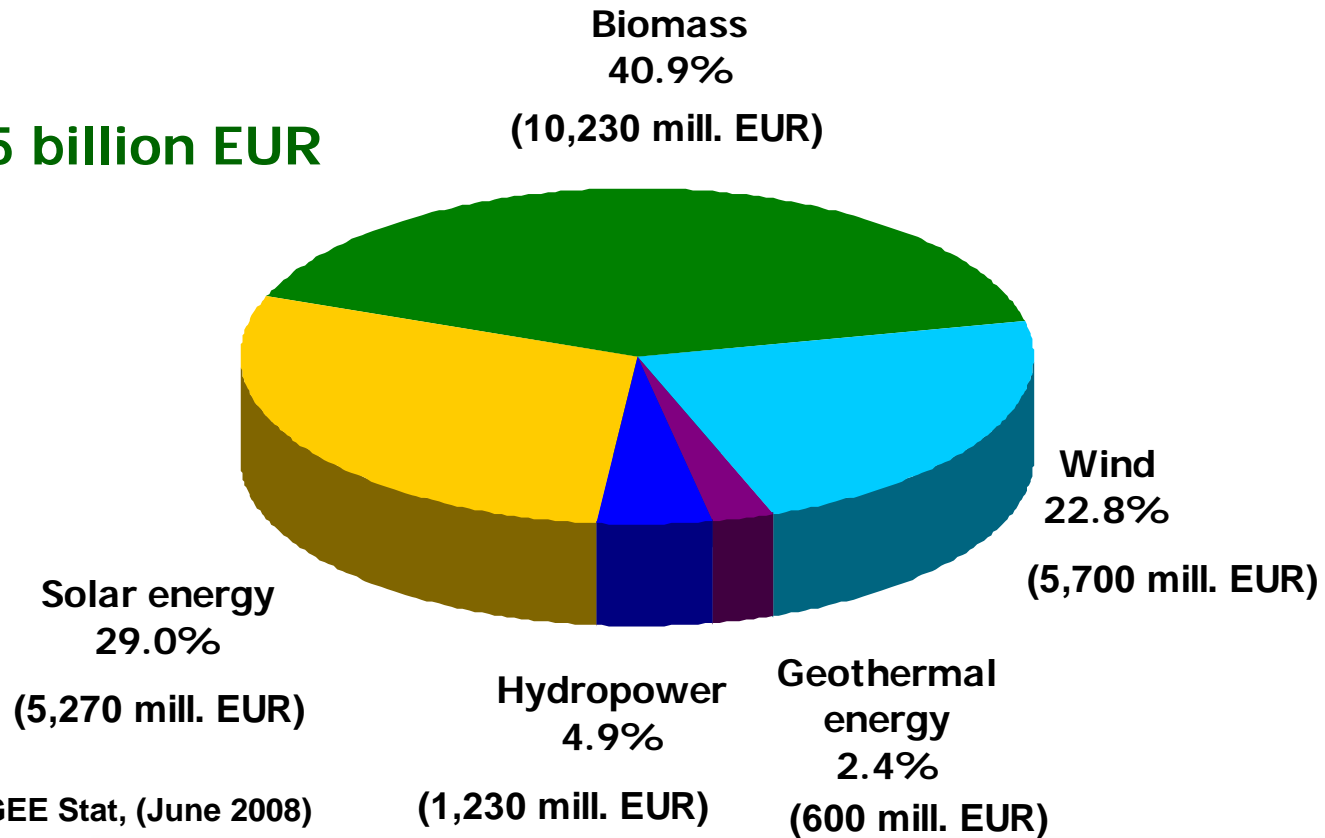


Source: BMU / AGEE Stat, (June 2008)

# Economical impact (2007)

## Total turnover with renewable energies

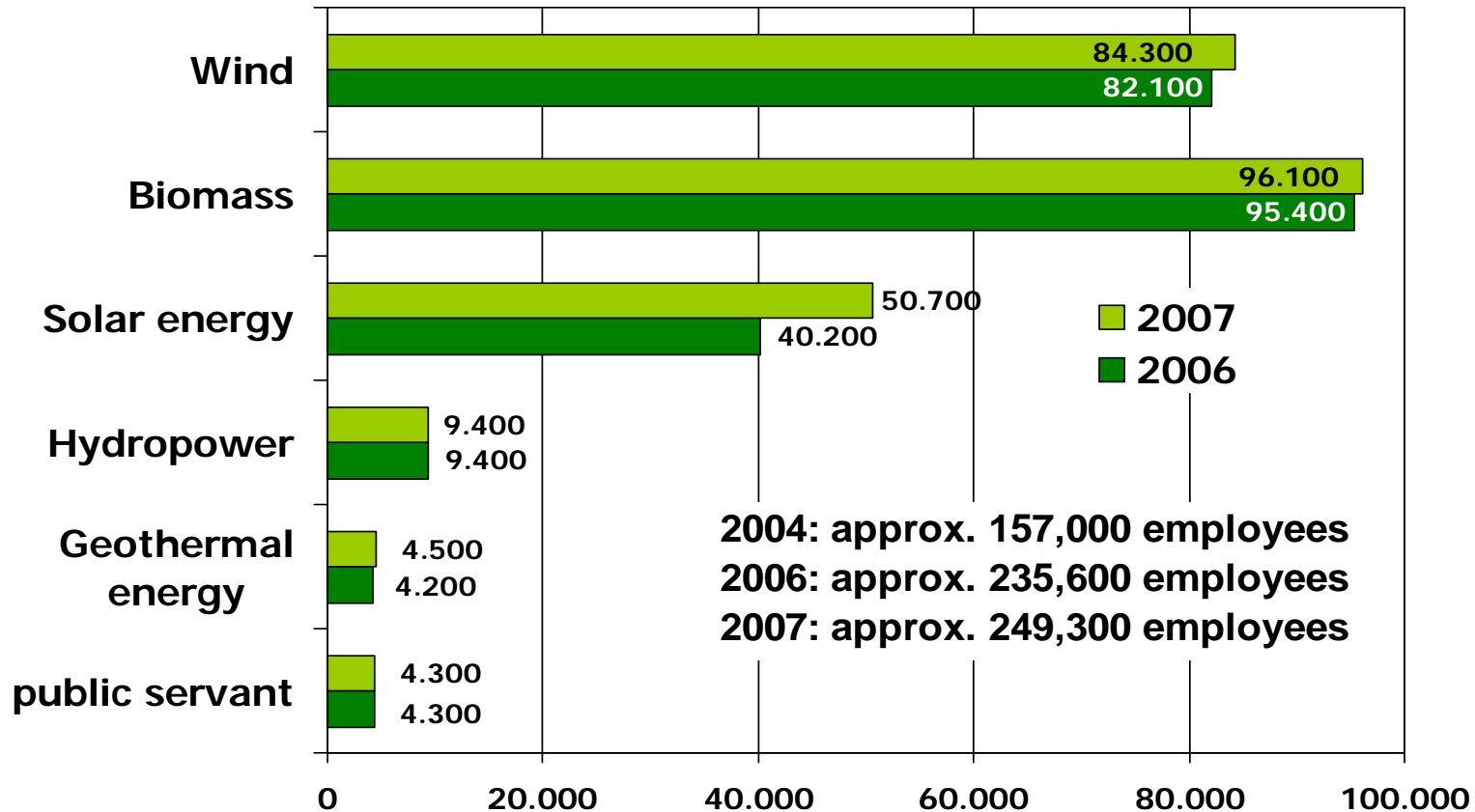
**Total:  
approx. 25 billion EUR**



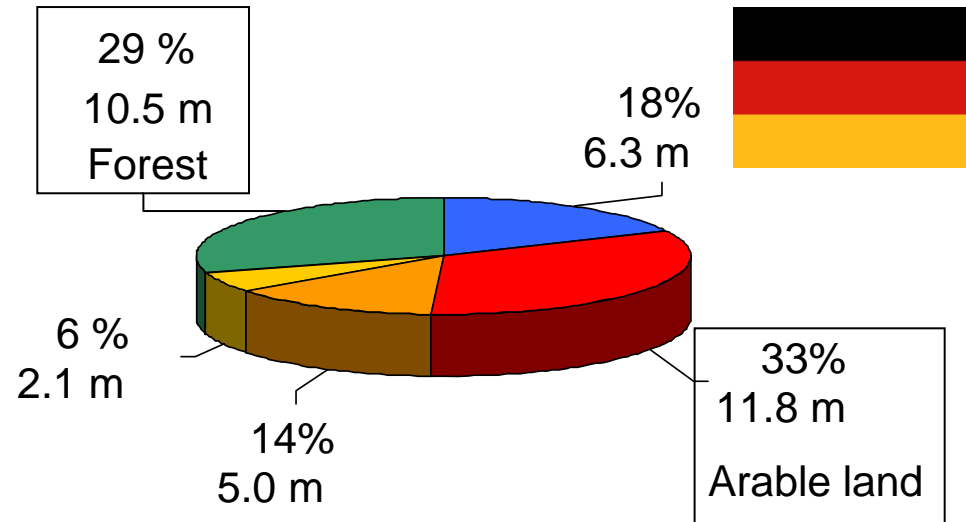
Source: BMU / AGEE Stat, (June 2008)

# Impacts on the German job market

## Employees in the renewable energy sector



## Land utilisation in Germany

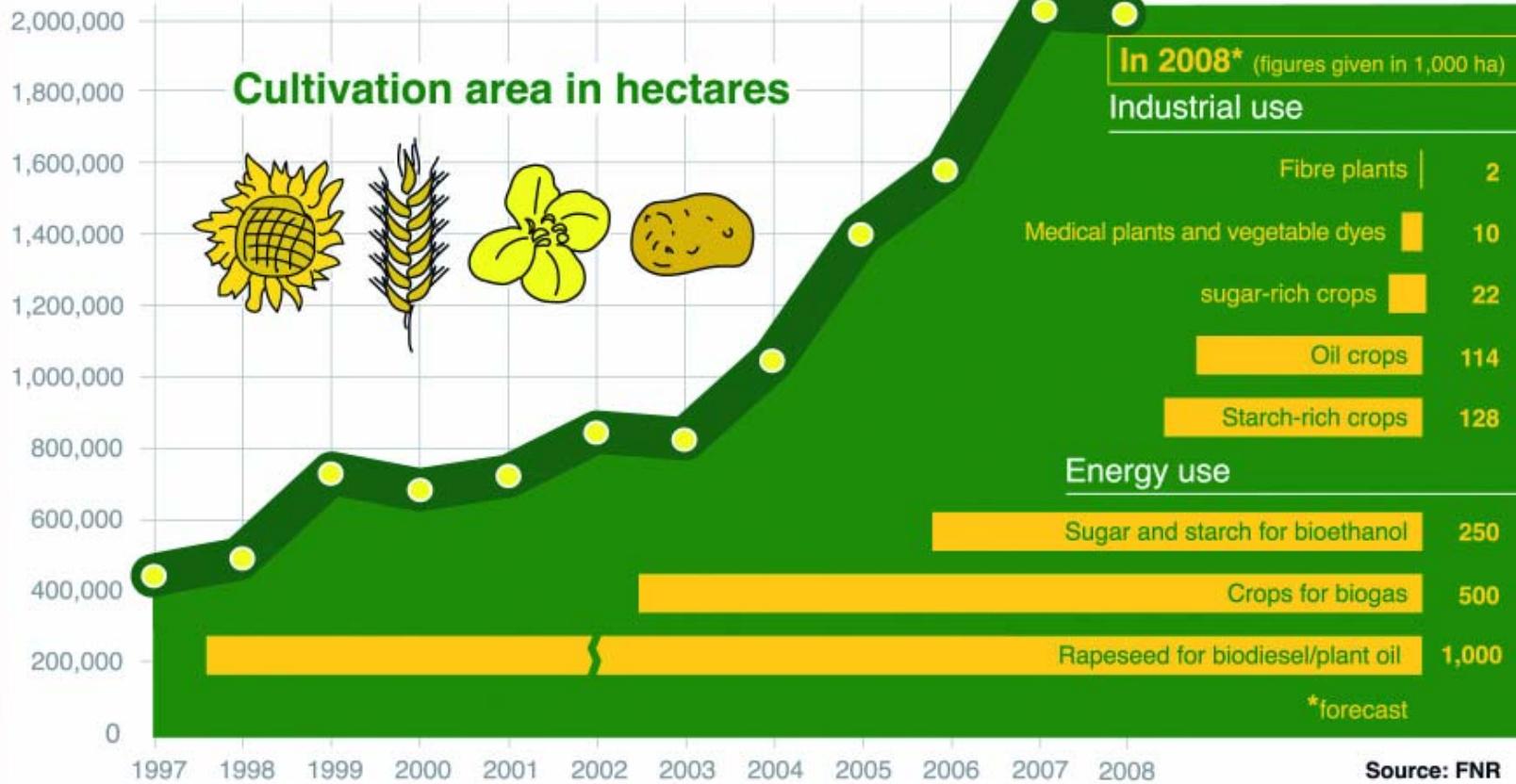


- Settlement, traffic, etc.
- Arable land
- Pasture
- Other agricultural land
- Forested land

Source: BMELV Statistics, 2006

# Cultivation of renewable resources in Germany

Increases in cultivation area between 1997 and 2008





## Wood as a renewable resource

	2002	2004	2005	Growth since 2002
Pulp and paper industry	6.4	8.5	9.8	+ 53%
DWP industry	17.2	19.4	20.5	+ 19%
Sawmill industry	30.3	33.6	37.2	+ 23%
Other industrial use	2.9	2.7	2.7	- 9%
Energetic > 1 MW	9.8	11,3	15.5	+ 58%
Energetic < 1 MW	3.4	3.6	3.6	+ 6%
Domestic combustion (mostly < 15 kW)	12.3	12.3	16.5	+ 34%
<b>Total</b>	<b>82.4</b>	<b>91.4</b>	<b>105.8</b>	<b>+ 28%</b>

Source: Mantau (Univ. Hamburg), 11/2006

All figures in million m<sup>3</sup>

## Main reasoning behind political action

- Environmental/climate protection
- Security of energy supply
  - total share of energy imports in Germany: 70%
  - for oil: almost 100%
  - for natural gas: 85%
- Additional income for farmers and foresters
- Employment in rural regions
- Development of technologies with export potential

## Targets for climate protection (Meseberg August 2007 and update April 2008))

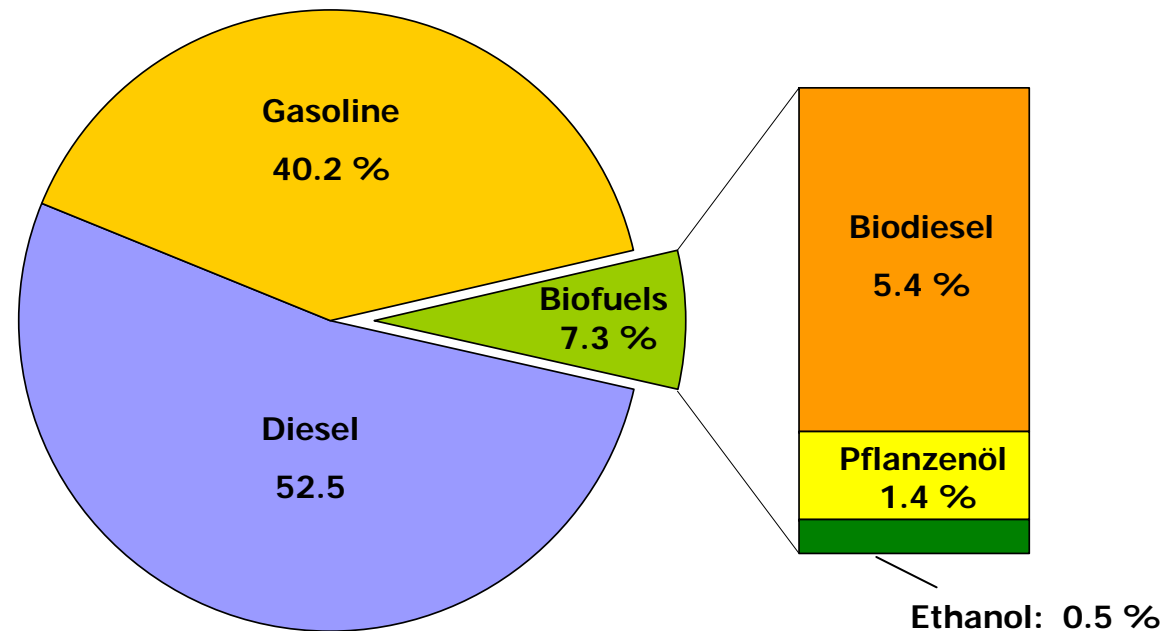
- Increasing the share of renewable energies in electricity production to 25 – 30% in 2020, plus further increase until 2030
- Doubling the share of electricity from CHP to 25% in 2020
- Increasing the share of heat production from renewable energies to 14% until 2020
- Substitute 6% of the current natural gas consumption by upgraded biogas in the gas grid until 2020
- Increasing the share of biofuels to 12-15 % (energy content) in 2020, plus evaluating the climate efficiency of biofuels

## Governmental targets

	Targets EU	Targets Germany	Status quo 2007 <sup>1)</sup>
<b>Greenhouse gas reduction (compared to 1990)</b>	- 8.0 % (2008-2012) - 30.0 % (2020)	-21.0 % (2008-2012) - 40.0 % (2020)	- 22.4 %
<b>Share of renewables in primary energy consumption</b>	20.0 % (2020)	20.0 % (2020)	8.6 %
- of which biomass			5.9 %
<b>Electricity from renewables</b>	21.0 % (2010)	12.5 % (2010) 30.0 % (2020)	14.2 %
- of which biomass			3.8 %
<b>Share of biofuels</b>	5.75 % (2010) 10.0 % (2020)	6.25 % (2014) 12-15.0 % (2020)	7.3 %
<b>Heat from renewables</b>	-	14.0 % (2020)	6.6 %
- of which biomass			6.1 %

## Road transport fuel consumption (2007)

- ▶ Fuel consumption 2007: approx. 53 M tonns (4.6 mill. t Biofuels)
- ▶ Biofuels contribution: 7.3 % (energetic)



Source : BMF/BAFA/FNR

# Framework Conditions for Biofuels

## •Energy Tax Law (Aug 2006)

- Since Aug 2006, taxation of pure biofuels
- Tax exempt:
  - 2nd generation biofuels until 2015
  - Biofuels used in agriculture and forestry

## •Biofuel Quota Act (Jan 2007)

- Introduction of biofuel quotas for:
  - Producers and traders of diesel fuel and gasoline
  - Producers of biofuels (biodiesel, vegetable oils)
- Quotas related to energy content (-> 2014)

Year	Tax rate biodiesel (Cents/l)	Tax rate plant oil (Cents/l)	Total quota
2007	9	2.15	
2008	15	10	
2009	<b>18</b>	18	<b>5.25</b>
2010	<b>24</b>	26	<b>6.25</b>
2011	<b>30</b>	33	↓
2012	<b>42</b>	45	
2013	<b>45</b>	45	
2014	<b>45</b>	45	<b>6.25</b>

(Draft 22 Oct 2008)

**From 2015 the GHG reduction based on the biofuel quota**

## Energy and climate programme

- Supporting CHP and extending local and district heating networks
- Improving their integration into the main electricity grid
- Support programmes for climate protection and energy efficiency
- Feed-in regulations for biogas (into gas grid)
- Law on Renewable Energies for Heating
- Evaluating biofuels as to their potential to reduce greenhouse gases, further increase of biofuel quota
- Increase research activities aiming at climate protection and energy efficiency in the frame of Germany's High-Tech Strategy
- Executing international projects, deepening political dialogue and research cooperation

# Sustainable biomass production

- Biomass production must follow the same standards as food/feed production
- Sustainability standards must apply internationally (no destruction of rainforests, protection of biodiversity)
- Biofuels as a precursor: the German government is preparing sustainability standards for a certification scheme



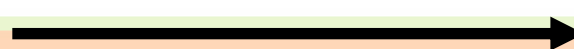
## Focus bioenergy: BtL fuels

- Synthetic fuels from biomass
- Development of efficient cultivation and processing procedures
- Projects:
  - Energy crop network: nationwide cultivation trials of different energy crop rotations
  - BtL pilot plant, TU Bergakademie Freiberg
  - Processing biomass for BtL production, Forschungszentrum Karlsruhe (Bioliq)
  - Joint project BioLog: conditioning of energy crops to achieve a homogeneous fuel

Concept:  
Field to fuel

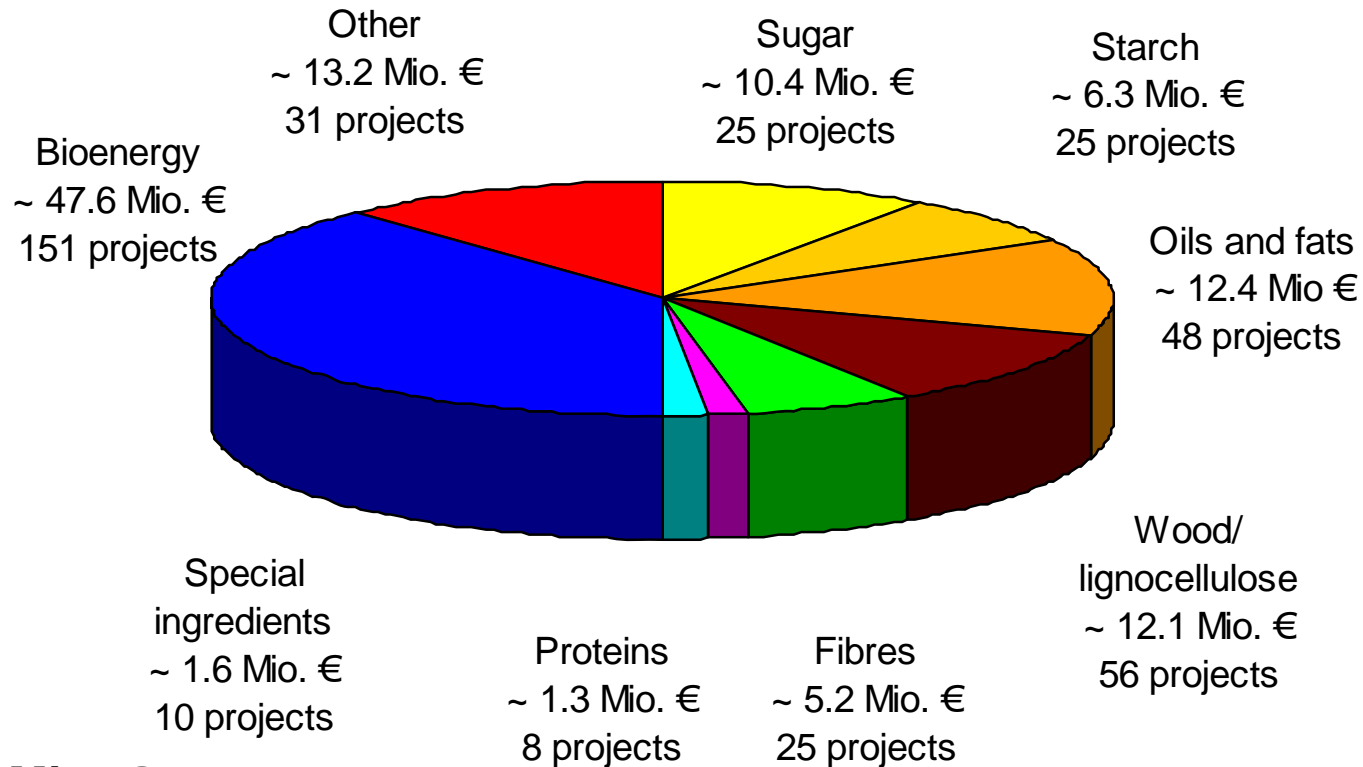


**Biomass**



**Fuel**

## Funding of ongoing projects divided by product line

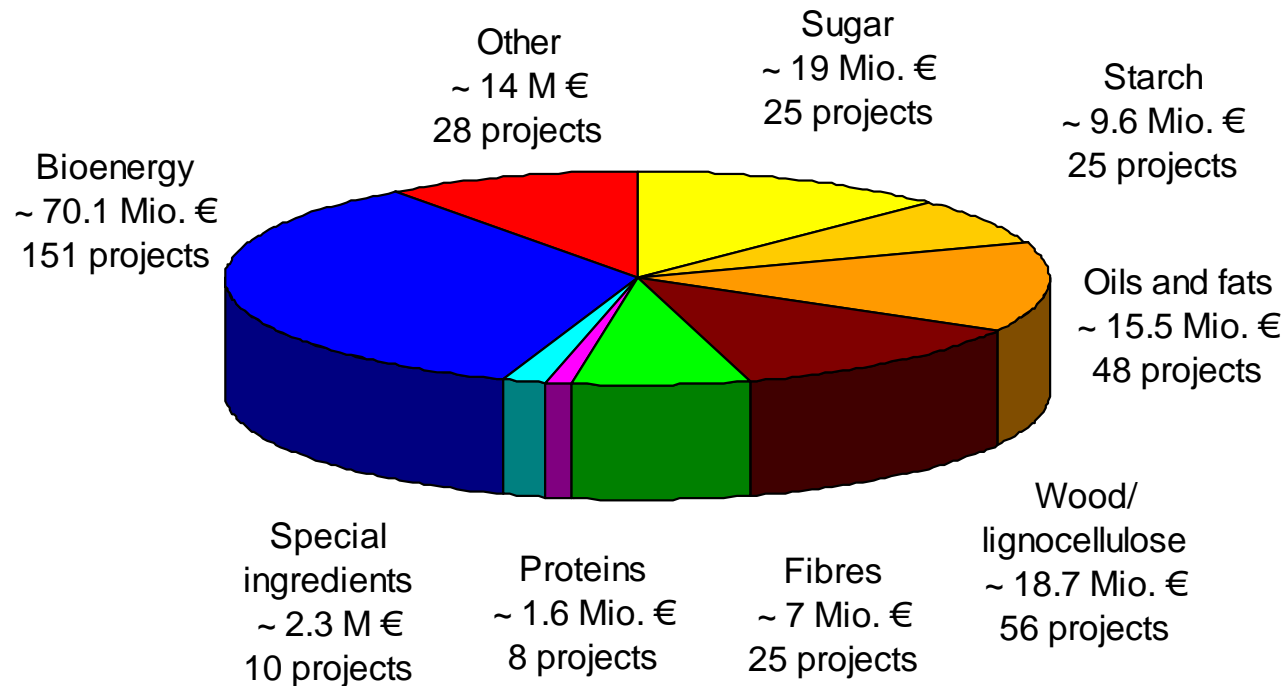


**Total: ~ 110 Mio. €**

**Total: 379 projects**

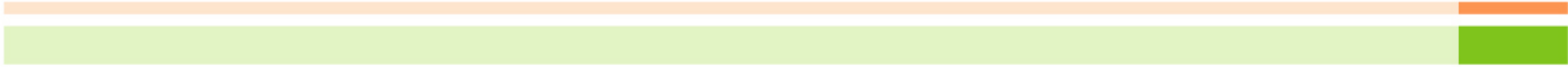
Figures: 01.10.2008

## Total costs of ongoing projects divided by product line



**Total: ~ 160 Mio. €**  
**Total: 379 projects**

Figures: 01.10.2008



Thank you  
for your attention

