



Bundesministerium für  
Ernährung, Landwirtschaft  
und Verbraucherschutz

# Biorefinica 2009

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Bundesministerium für Ernährung, Landwirtschaft und  
Verbraucherschutz

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Answers must be found to the following questions:

- **What role can renewable raw materials play in securing supplies of resources?**
- **What are the arguments in favour of using renewable raw materials in industry?**
- **Are supplies of biomass adequate, both in Germany and globally?**
- **How can we steer use of these raw materials to areas in which they bring most benefit?**
- **What needs to be done to ensure biomass is produced sustainably?**

# Globale Biomasse

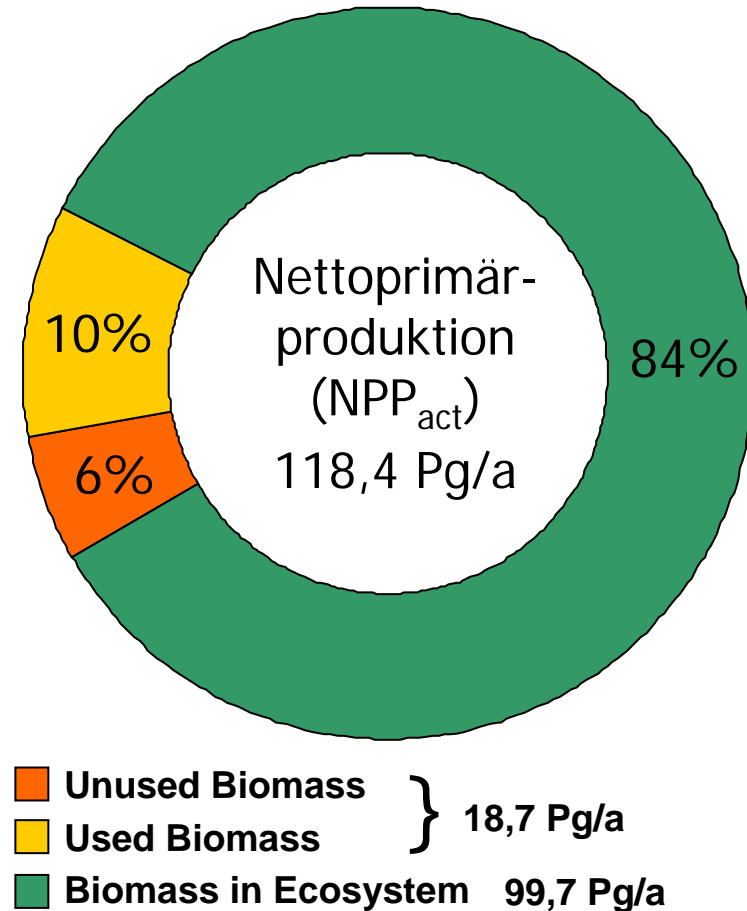
## Verfügbarkeit und Entnahme (2000)

1 Petagramm (Pg) = 1 Mrd Tonnen

Used Biomass Extraction	[Pg]	%
Harvested Crops	3,43	28
Crop Residues	2,94	24
Grazed Biomass	3,84	32
Wood Removal	1,94	16
<b>Total</b>	<b>12,14</b>	<b>100</b>

Unused Biomass Extraction	[Pg]	%
Human Induced Fires	2,49	38
Unused Crop Residues	1,92	29
Unused Belowground	1,50	23
Felling Loses in Forests	0,65	10
<b>Total</b>	<b>6,56</b>	<b>100</b>



# Biomasse in Deutschland

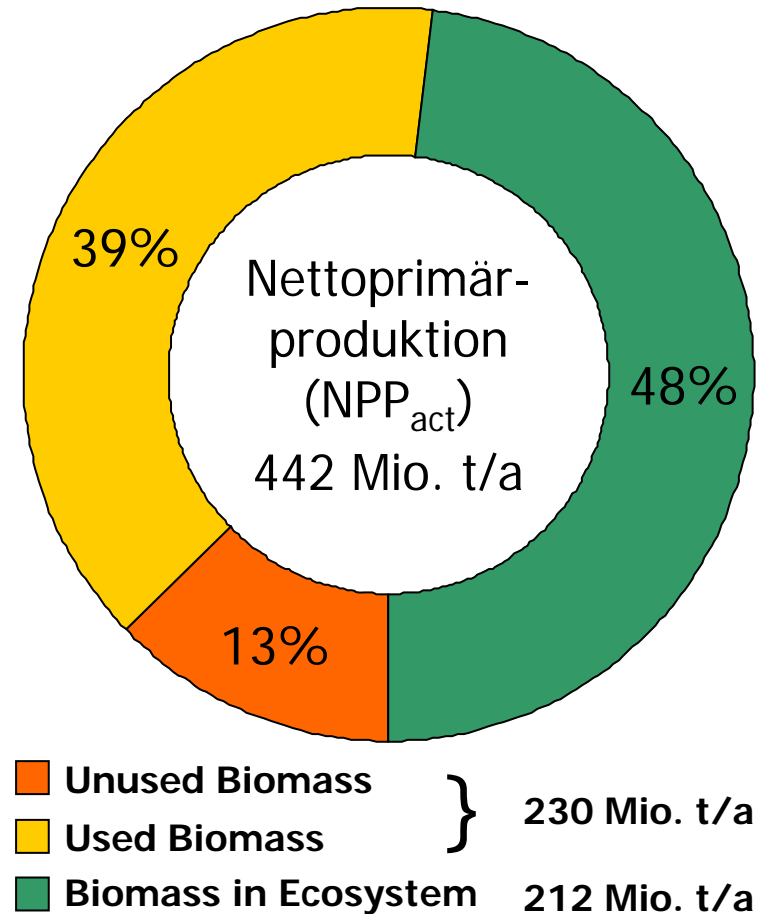
## Verfügbarkeit und Entnahme (2000)

1 Petagramm (Pg) = 1 Mrd Tonnen

Used Biomass Extraction	[Mio. t]	%
Harvested Crops	74	43
Crop Residues	35	20
Grazed Biomass	44	25
Wood Removal	20	12
<b>Total</b>	<b>173</b>	<b>100</b>

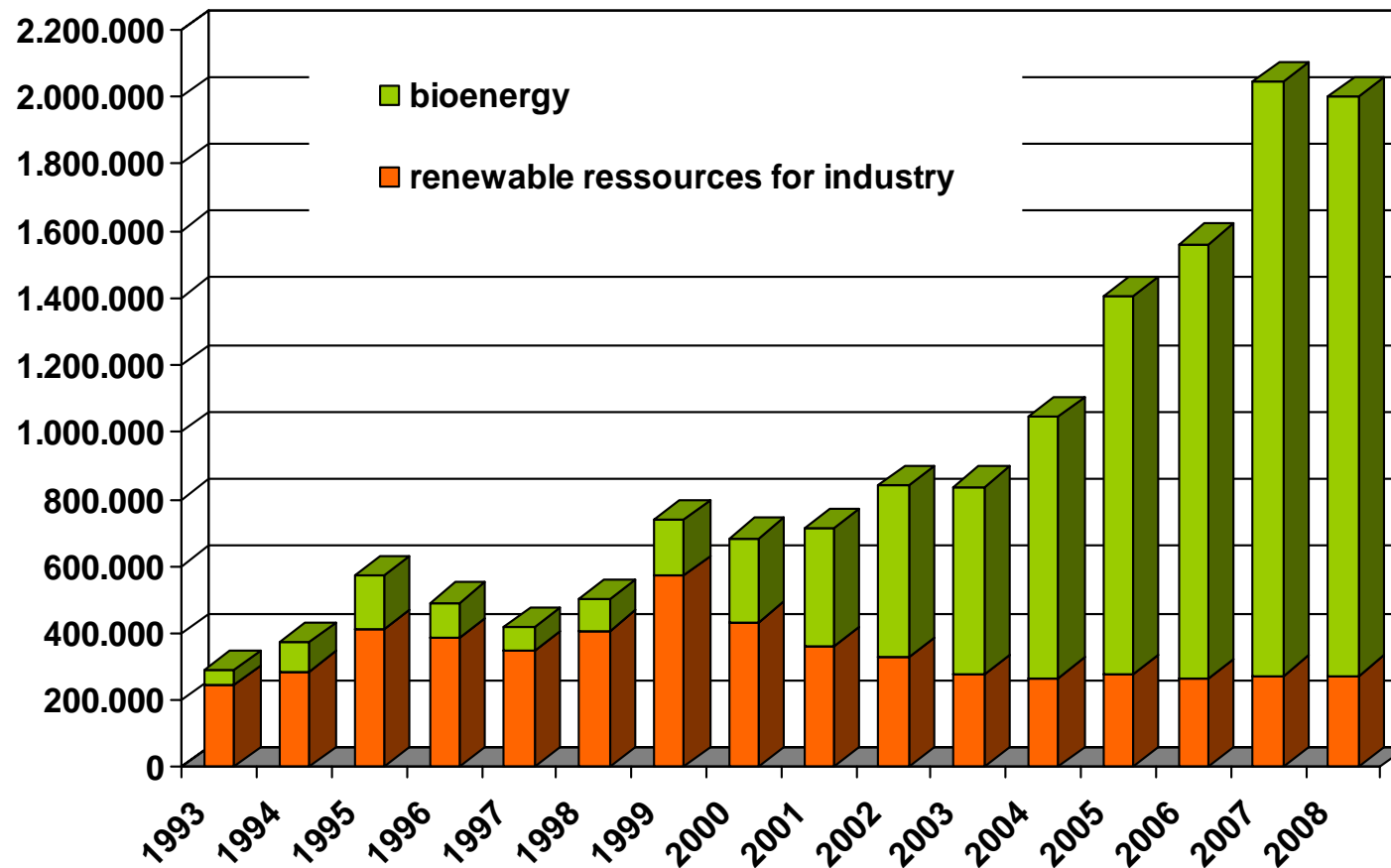
Unused Biomass Extraction	[Mio t]	%
Human Induced Fires	0,1	<1
Unused Crop Residues	27	47
Unused Belowground	25	44
Felling Loses in Forests	5	9
<b>Total</b>	<b>57</b>	<b>100</b>



Quelle: Krausmann et al., Ecological Economics 65 (2008) 471-487

## Non-food arable land in Germany used for non-food production

**2008: 2,0 Mio. hectares = 17 % of arable land**



Quelle: BMELV, BLE

## State-of-the-Art in Bioproducts

RRM in Germany

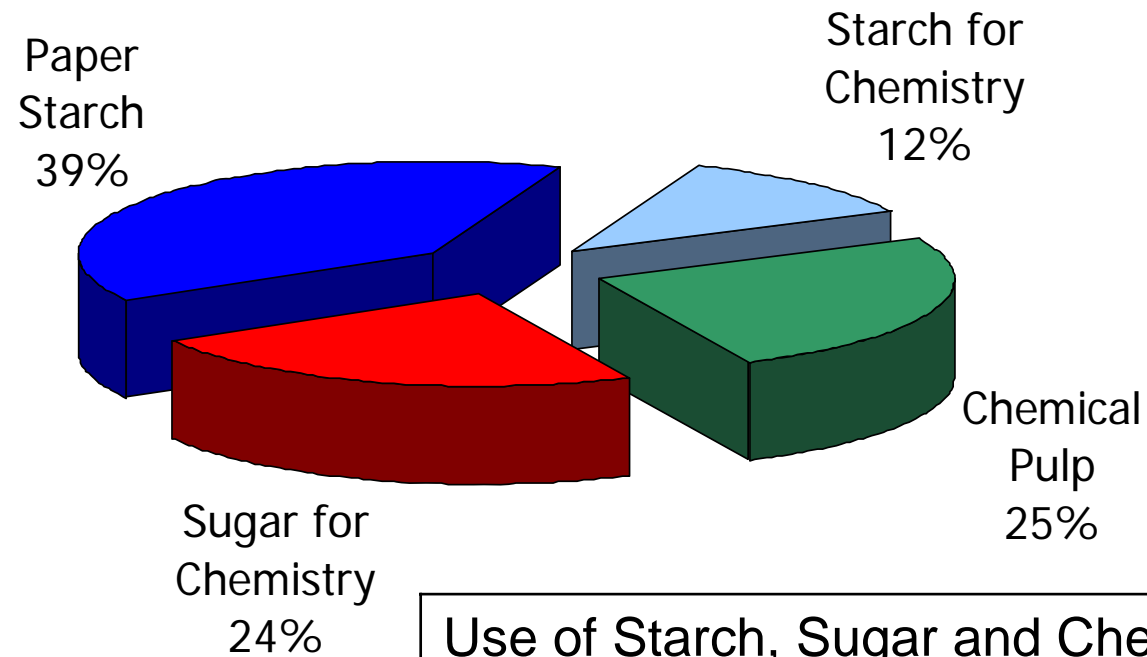
Currently, about 17 Mio. t fossil and 2,1 Mio. t renewable raw materials are used in the German chemical industry\*, i.e. roughly 11% of the raw materials are RRM.

- 1.150.000 t Vegetable Oil and Animal Fat,
- 260.000 t Starch for Chemistry,
- 320.000 t Cellulose,
- 295.000 t Sugar,
- about 117.000 t of other Plant-derived Raw Materials

Roughly 2/3 of the currently in Germany used agricultural RRM are imported, whereas 1/3 are domestic.

## State-of-the-Art in Bioproducts

### Carbohydrates

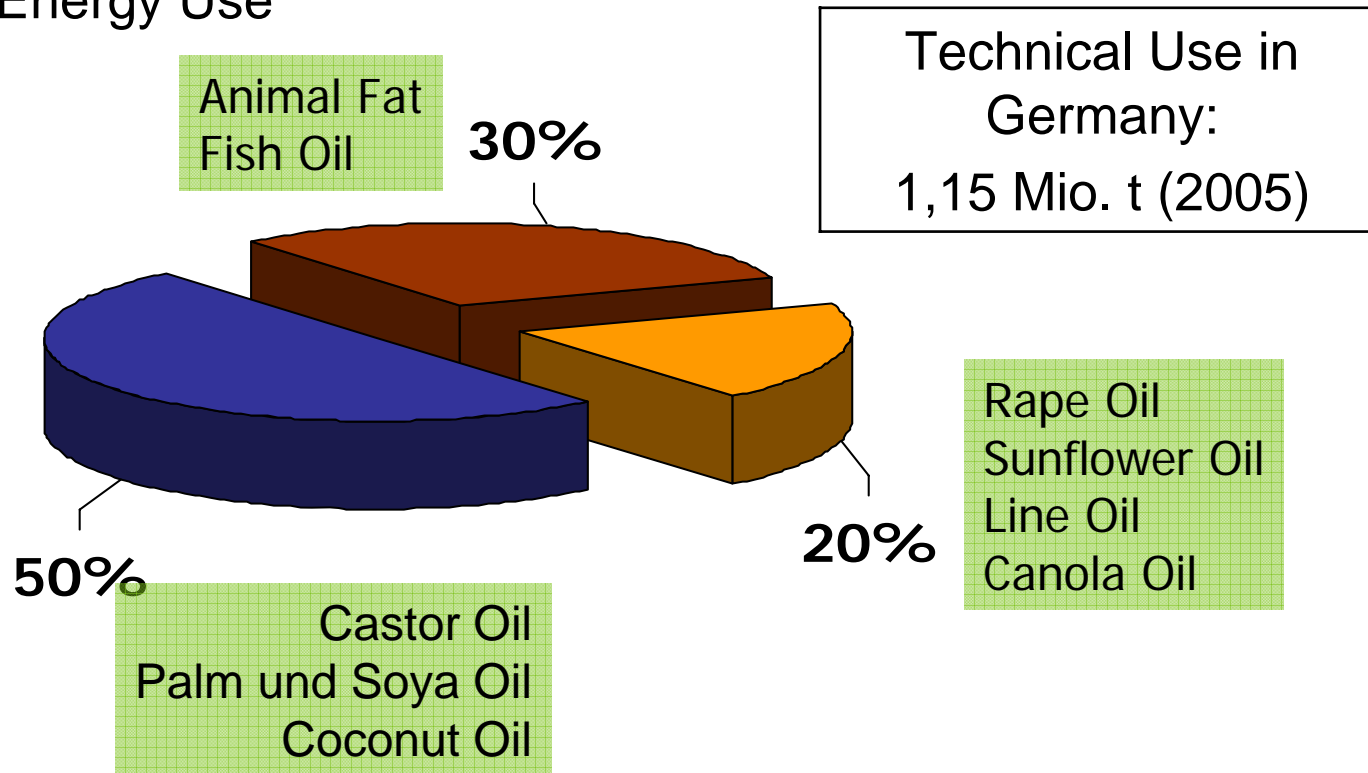


Use of Starch, Sugar and Chemical Pulp in Germany:  
1,3 Mio. t (2005)

## State-of-the-Art in Bioproducts

### Use of Oils and Fats

#### Non-Energy Use

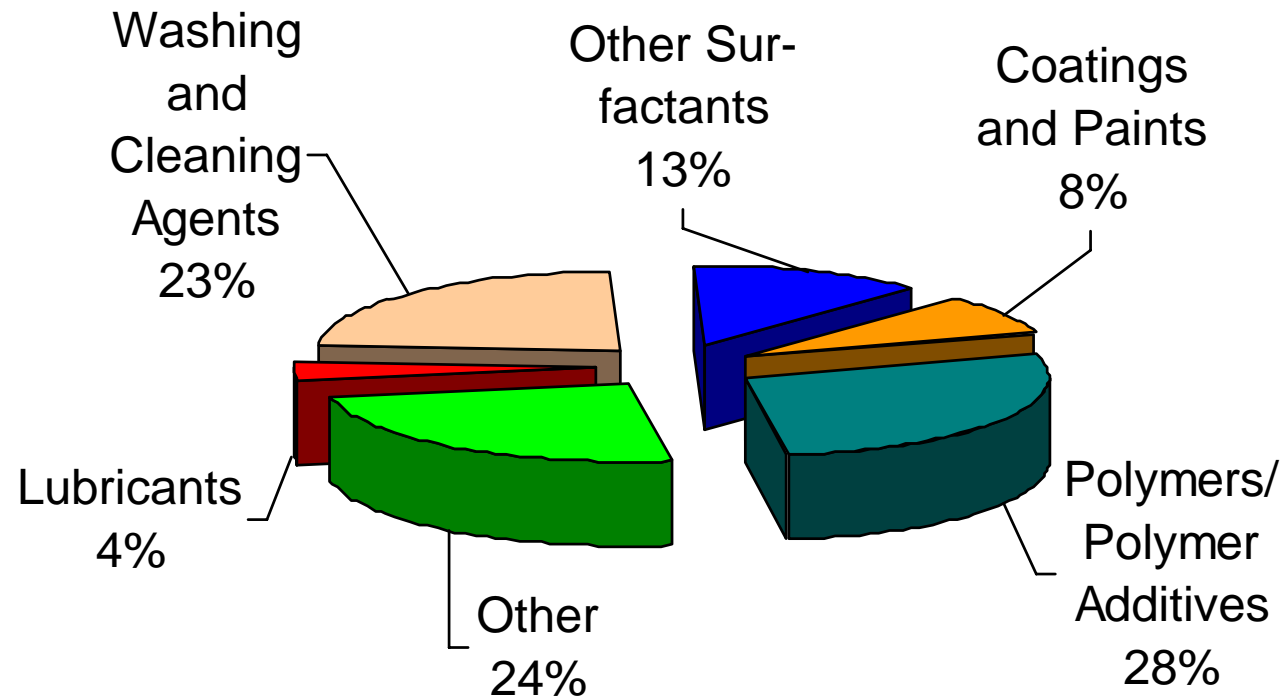




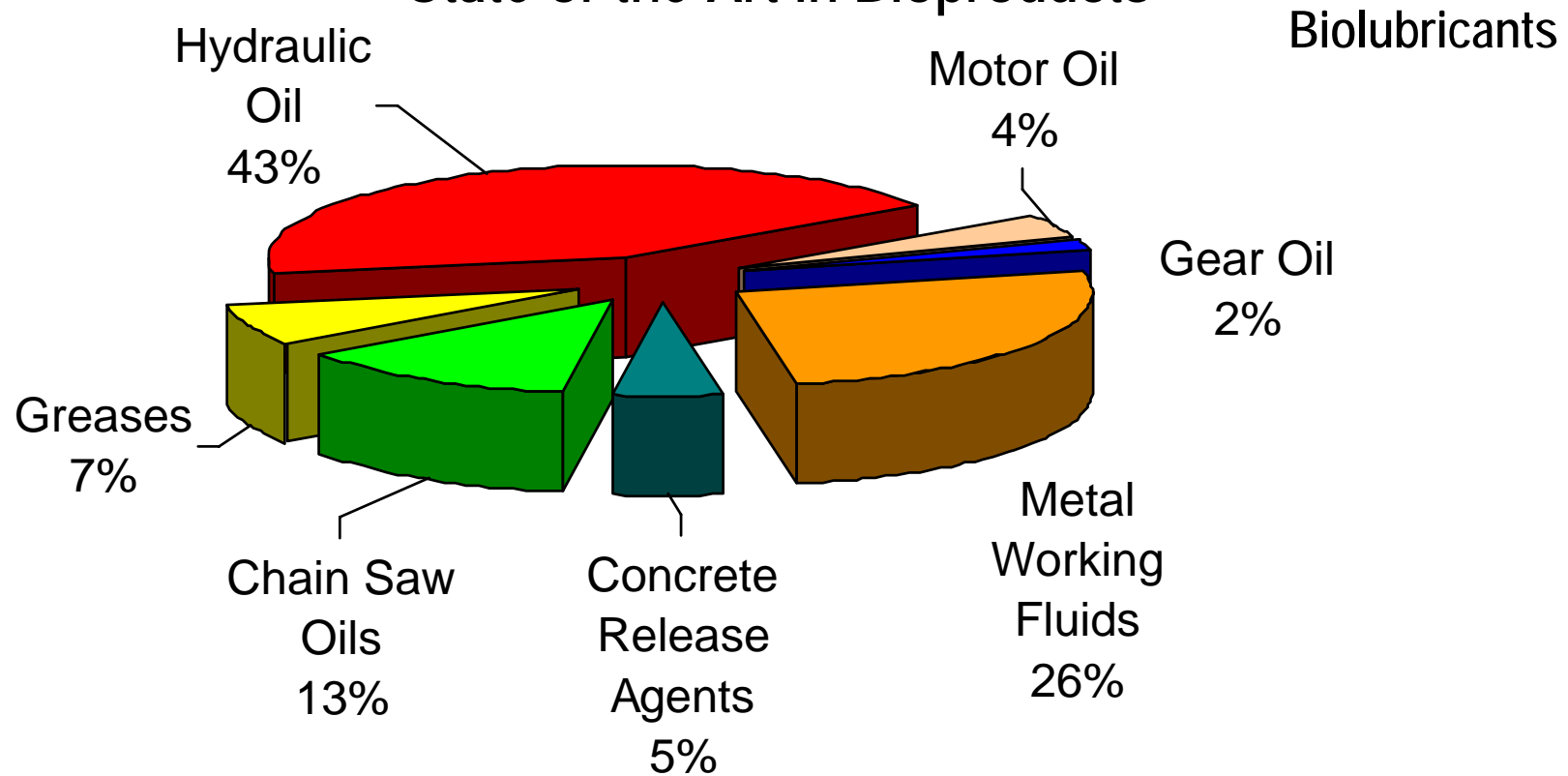
## State-of-the-Art in Bioproducts

### Applications of Oils and Fats

#### Fields of Non-Energy Use



## State-of-the-Art in Bioproducts



Biolubricants in Germany: 46.500 t (2004)  
(~4 % of all Lubricants in Germany)

# International Cooperation in KBBE Activities

- **ERA-Net Industrial Biotechnology**
- **SusChem-D in the frame of ETP SusChem**
- **European RRM working group “Renewable raw materials and their use in non-food industries“**
- **ERRMA**



## Policy Framework for Industrial Use of Renewable Raw Materials

### **Federal German Government's High-Tech Strategy**

- The use of crops to produce raw materials is one of 17 future-focused areas in which innovation policy measures have been defined.

### **Federal German Government's Sustainability Strategy**

- Multiple use of renewable raw materials via cascade use systems and biorefineries

### **BMELV: R&D Programme on Renewable Raw Material Research, Development and Demonstration**

- €45 million in 2009
- Linkage between science and industry; promotion of research clusters and alliances/networks.

### **BMBF: R&D programmes - BioIndustry 2021 and BioEnergy 2021**

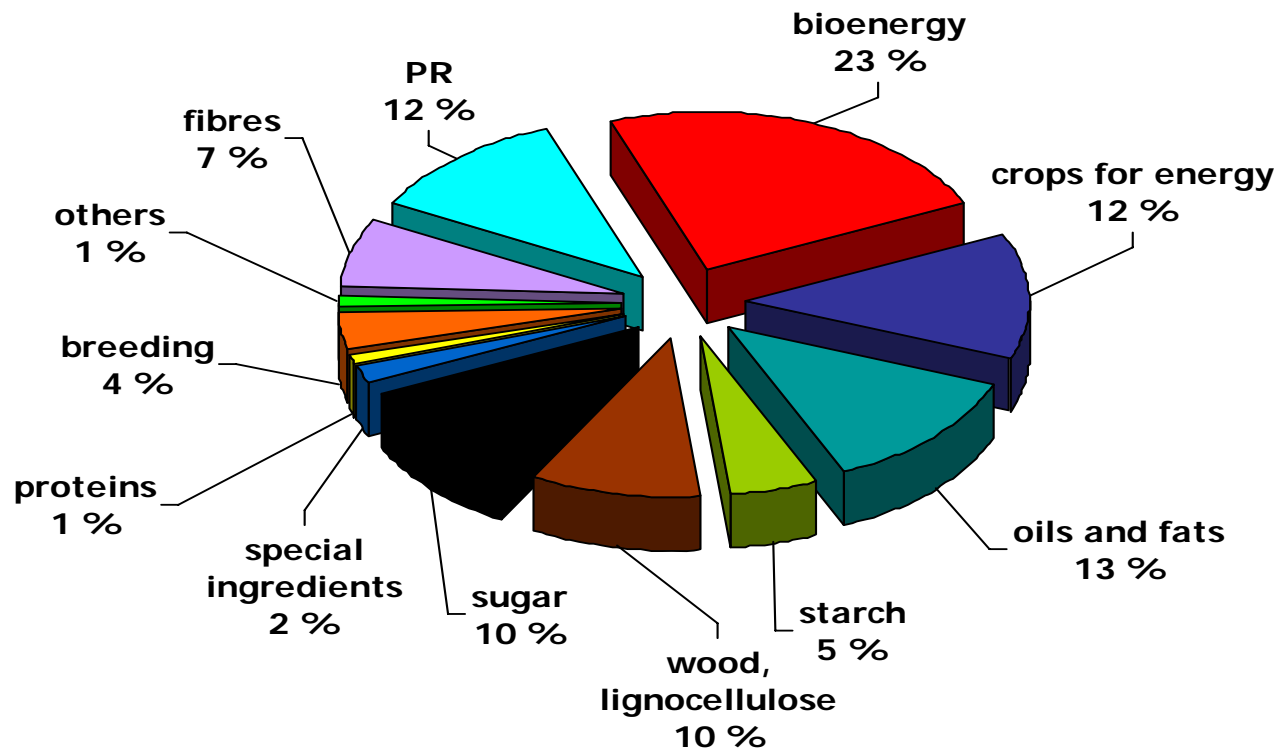
**BMU: Environmental studies; preliminary studies involving pilot facility**

**EU: Lead Markets Initiative**

## projekt promotion (BMELV/FNR)

amount: 103,6 Mio. €

projects: 362



Stand: 2008

## Current Biomass-related Calls – Bioproducts (BMELV/FNR)

- **Technical and special Polymers based on RRM & Synthesis of fine and speciality chemicals from biomass (since 2004)**
- **Wood use for construction and materials (since 2006)**
- **Biopolymers, WPC, fibre-reinforced materials (since 2007)**
- **Applied RTD focused on biomass by Young Scientists (2006-2011)**
- **SusChem-D: New Methods of chemical as well as enzymatic and biotechnological transformation of carbohydrates, vegetable oil and animal fats as well as proteins“ (2008-2011)**
- **RTD based on biomass by Innovation Clusters (2008-2013)**
- **Applied RTD focused on multiple usage of biomass, biorefineries (2009-2012)**

## Demonstration – LCF Biorefinery (BMELV/FNR)

**Pilot projects on a lignocellulose biorefinery and on new enzymes for the degradation of lignocellulose components and the sustainable production of fine chemicals“ (from 2007)**

**Funding: 2,2 Mio. €(phase 1), N.N. (phase 2)**

- **Joint consortium of 19 partners from industry and academia**
- **First phase (2007-2009): proof of feasibility on lab scale**
- **Second Phase (from 2009): construction of a LCF biorefinery pilot plant focusing on bio-based products**

## competition food versus non-food

- **Approaches to reduce the competition between food and non food**
  - ◆ use biogenous residues stronger (z. B. liquid manure, straw, inferior cereals)
  - ◆ mobilize arable land (abolishment of the obligatory set aside),
  - ◆ improve yields in food and non-food production
- **Approaches to reduce the competition between energetic and industrial use**
  - ◆ review of regulations supporting bioenergy
  - ◆ supporting cascade- and biorefinery concepts



## sustainable biomass production

- **sustainable biomass production in EU is guaranteed by cross compliance (no difference between food and non-food)**
- **objective: worldwide standardisation and certification-system for food and non-food production from biomass**
- **first steps:**
  - ◆ national sustainability regulation for biofuels
  - ◆ EU-Renewable-Energy-Directive

## Conclusions/Action Needed

### **Federal German Government's National Biomass Action Plan**

- **Managed by BMELV (Referat N2)**
- **Industry recommendations received. These are now being integrated into the plan and will then be put forward for approval.**
- **Scheduled completion: Summer 2009**



***Thank you for your attention!***

