

Knowledge Based Bio Economy KBBE towards 2020  
Conference

# AGRICULTURE AND THE BIOBASED ECONOMY – OPPORTUNITIES AND CHALLENGES

Franz Fischler, Brussels 14. Sept. 2010

# Outline

- The Potential of the biobased economy
- Risks and ethical impacts
- The impacts for Agriculture
- Fields of action
- The biobased economy and the CAP

# What is a biobased economy?

„Bioeconomy includes all industries and economic sectors that produce, manage and otherwise exploit biological resources (and related services, supply or consumer industries), such as agriculture, food, fisheries, forestry, etc.“

Bioeconomy Conference 2005

## A new definition of biobased economy

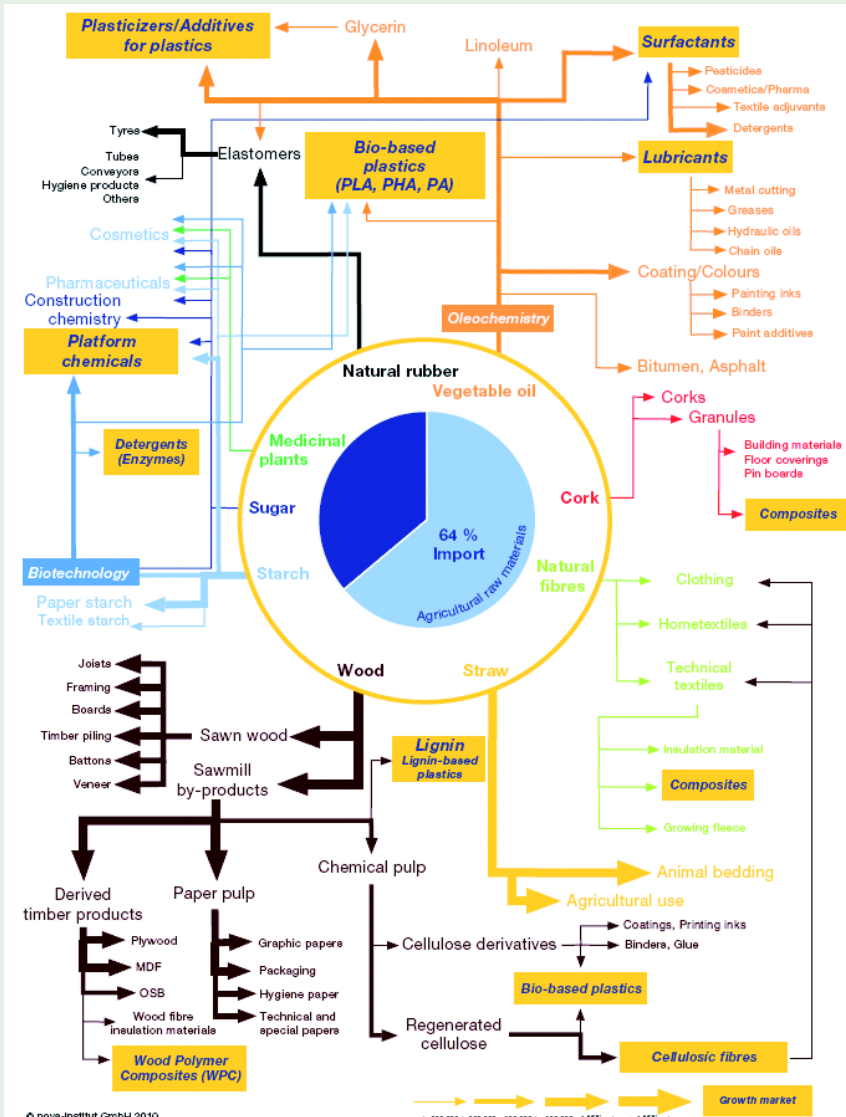
„A Biobased Economy is based on production paradigms that rely on biological processes and, as with natural ecosystems, use natural inputs, expended minimum amounts of energy and do not produce waste as all materials discarded by one process are inputs for another process and are reused in the ecosystem.“

(WWF Denmark)

## Goals for KBBE policies- they should:

- Support existing and new efficiency enabling solutions to fully capitalize on their short term potentials
- Anticipate and nurture the progression towards large scale biomaterial and closed loop systems
- Ensure that the supply of industrial biotechnology feedstock land is managed according to principles of sustainability

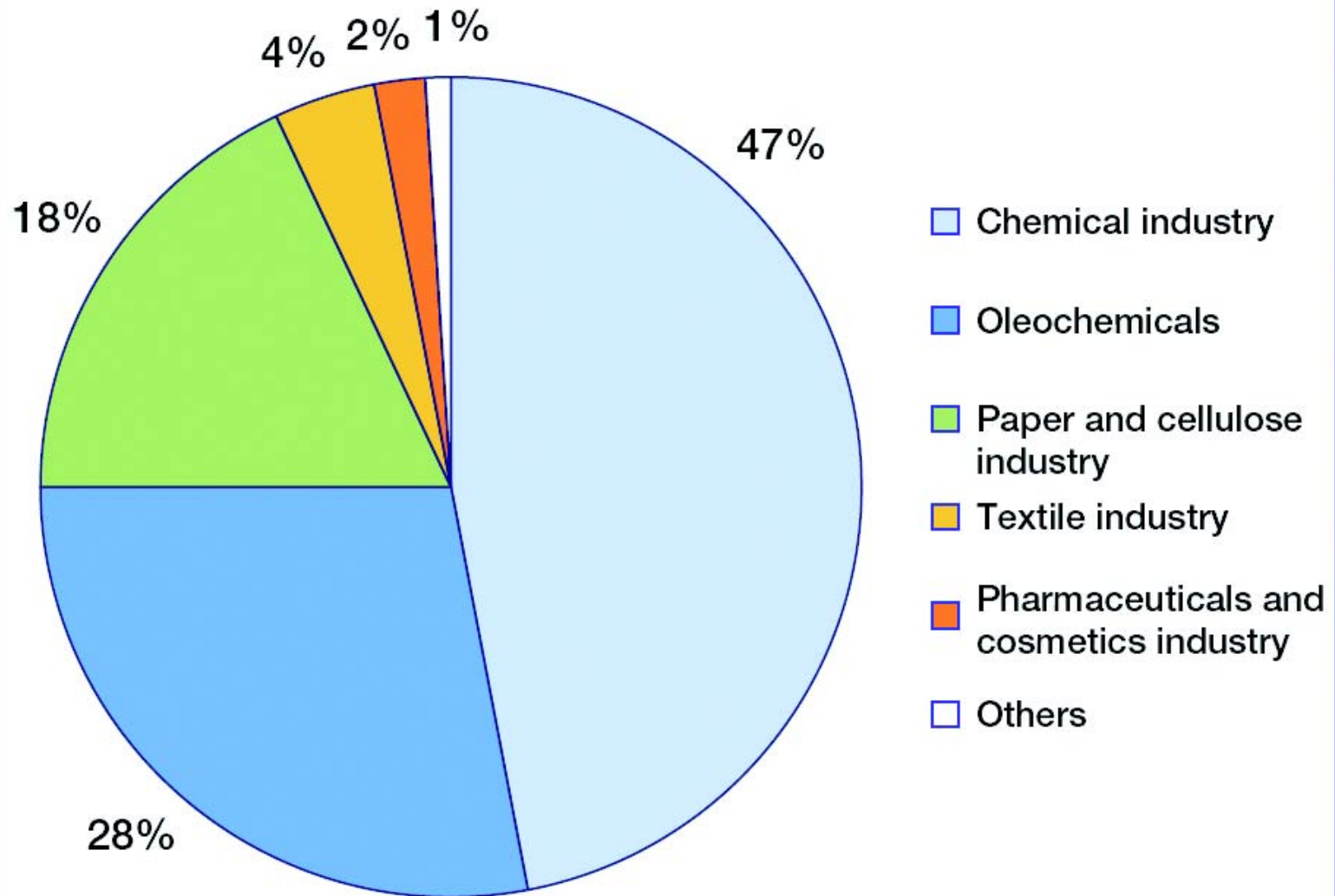
(WWF Denmark)



Agricultural and forestry products are the basis for multifold material use



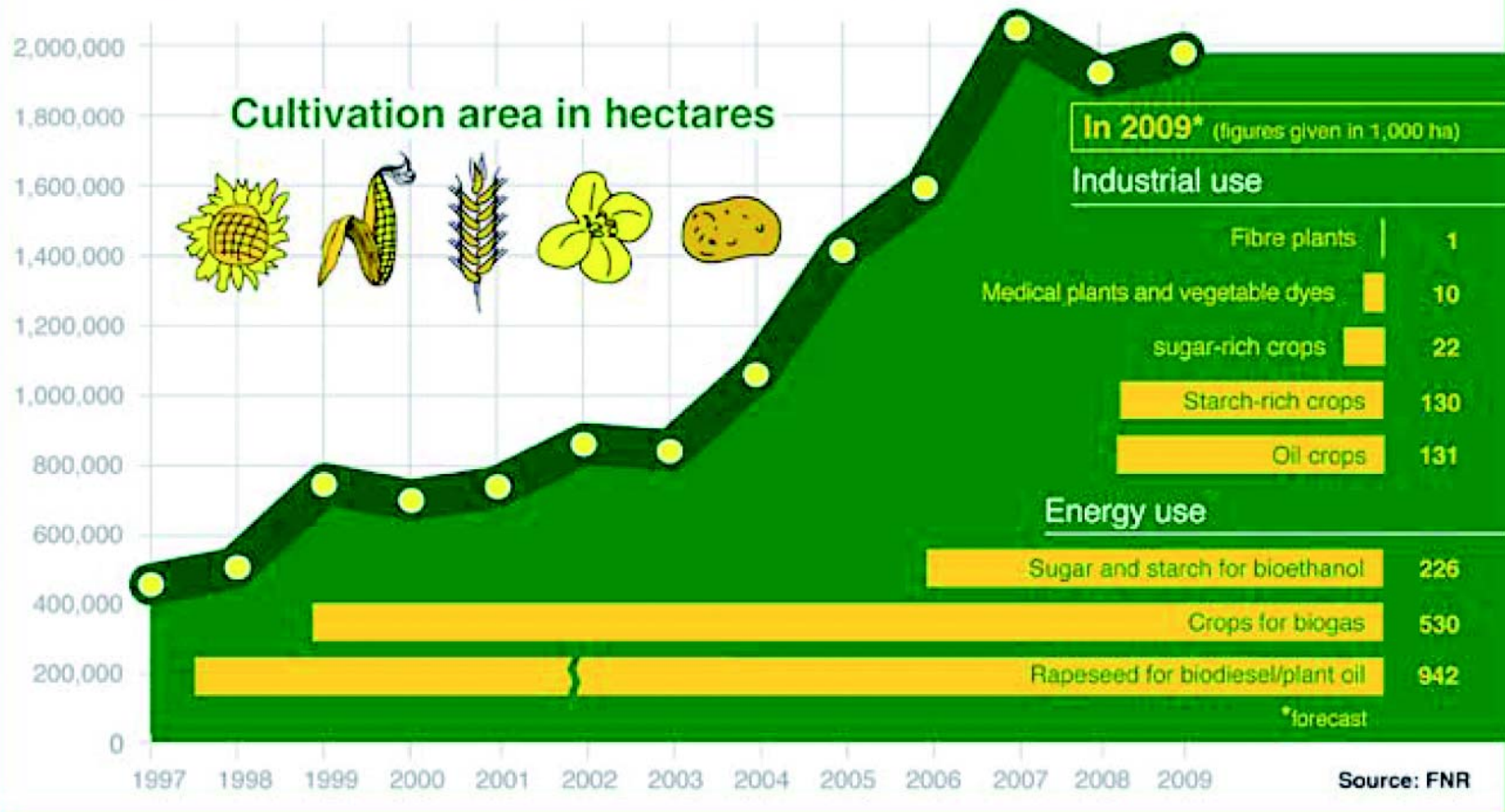
## Use of renewable raw materials (excluding wood)



# GROWING IMPORTANCE OF CROPS FOR NON-FOOD USE

## Cultivation of renewable resources in Germany

Increases in cultivation area between 1997 and 2009





# THE PROSPECTS FOR 2020

New enabling policy environment scenario – quantities and areas in 2020 (Germany)		
Renewable Raw Material and Uses	Quantity in tonnes	Production area in ha
Starch and sugar in chemicals, biotechnology and bio-based materials	2,440,000	475,000 wheat und 175,000 sugar beet
Starch in the paper and corrugated card industry	780,000	195,000 wheat
Vegetable oils in the oleochemical and bio-based material industry	1,660,000	905,000 rapeseed
Natural fibres (hemp), miscanthus and short rotation coppice in bio-based materials, textiles and insulation materials	34,000 hemp in addition miscanthus, SRC and others	ca. 65,000–70,000 particularly hemp, miscanthus and SRC
Phyto-pharmaceuticals		20,000 diverse
<b>Total</b>	<b>–</b>	<b>1,840,000 ha</b>

Source: nova-Institut 2010

## Socio-political effects of the material and energy uses of renewable materials

Criteria	Energy	Material uses
Employment and value-added per unit raw biomass or land area	Short, simple value chains	5–10 fold effect on employment and 4–9 fold value-added compared with energy uses; predominantly long and complex value chains
Biodiversity effects	Depends on a few widely-grown crops such as wheat, oilseed rape, maize and sugar beet. High fertiliser and pesticide needs, risk of monocultures	10 % of the cropped area comprises a very diverse range of species with low fertiliser and pesticide requirements; no differences in the case of widely grown species.
Greenhouse gas mitigation per ha	Significant reduction compared to fossil energy sources	Often higher mitigation effects compared with energy uses; long-term carbon storage
Cascading utilization	No cascade of uses	Multiple and successive material uses possible, ending with energy use
Future prospects	Limited – there are many alternatives (sun, wind etc.)	High – there are no alternatives
Markets	Highly regulated, standardised products with local markets (apart from transport biofuels)	Diverse range of products, unregulated markets, global competition
Subsidy support	High	Low, and time limited
Growth in the production area in Germany	Ten-fold growth over the last ten years	No growth over the last 10 years

Source: nova-Institut 2010

# The 4 fundamental benefits of a biobased economy

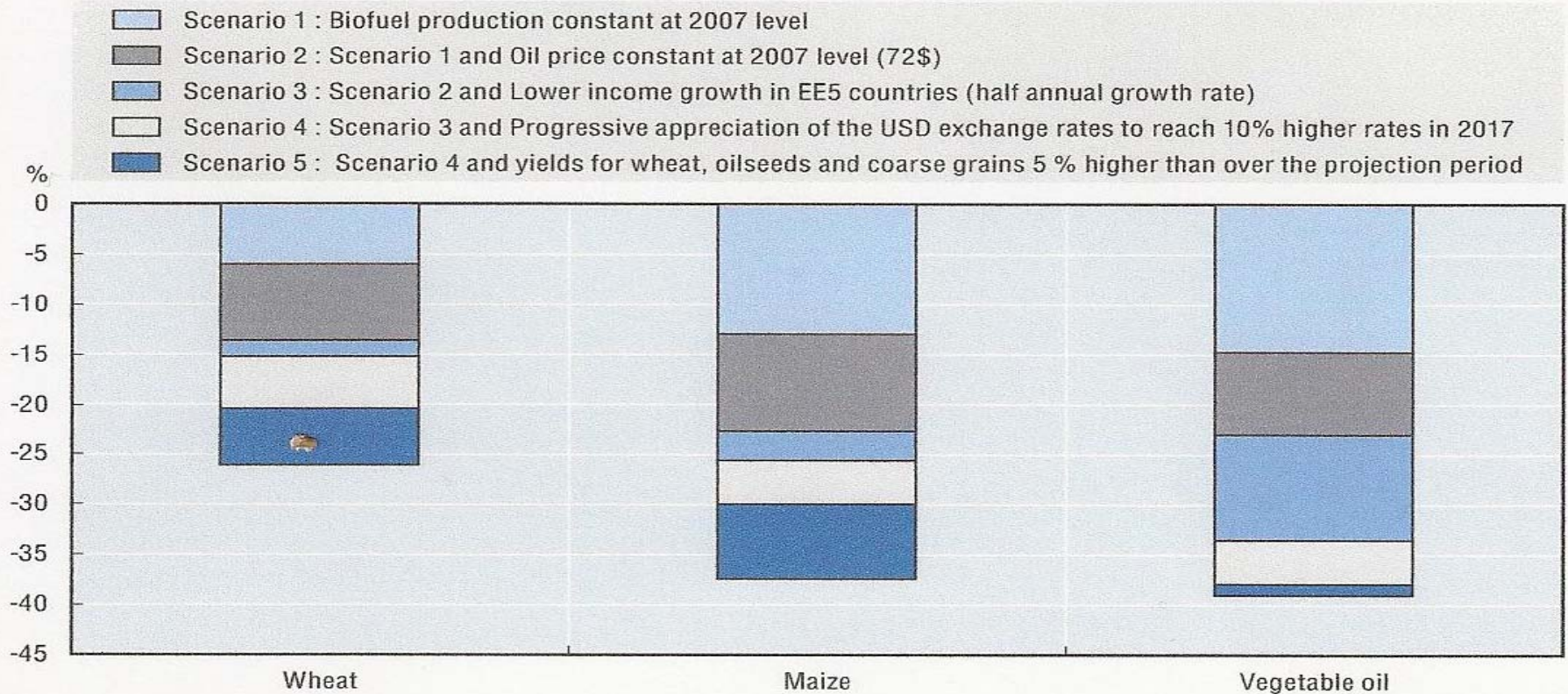
- Improved efficiency
- Substitution of fossil fuels
- Substitution of oil based materials
- The creation of closed loop systems

# But no progress is without risks...

Frequently raised concerns:

- Genetic engineering creates health and environmental risks
- Renewable material and energy use increase food prices and therefore hunger in the world
- The biobased economy leads to further intensification in the agricultural production with soil degradation, enormous water consumption, erosion and reduction of biodiversity
- Biobased economy helps the big farmers and favours the industrialisation of the Ag-sector

**Figure 2.5. Sensitivity of projected world prices to changes in five key assumptions, percentage difference from baseline values, 2017**



Source: OECD and FAO Secretariats.



# An intensive public debate is needed

about:

- Adequate risk assessment and - management
- Cost – benefit analysis
- White biotechnology, nanotechnology converging technologies
- Resacralisation of nature and romantication of agriculture

# Impacts on Agriculture

# New agricultural crops and cropvarieties

- Transformation of wild plants into agricultural crops
- New plant varieties specialised for different material use
- GMO-crops for material use



## Different crop production methods

- Precision farming
- Low-or no- tillage agriculture
- New harvest methods
- Different crop protection systems
- Enlarged crop rotation
- Storage and marketing

# The possible use of residues and waste

- Straw
- Hemicellulose
- Residues and wastes from the food industry

# Fields of action

- Research and Development
- Experimental farming
- Contracts and cooperation
- Legal frame work
- Use of abandoned land
- Incentives

# DEVELOPED SUPPORT INSTRUMENTS

## Support instruments for material use of renewable resources

Priority instruments Over-arching sectors	Production support through refunding production costs linked to avoided CO <sub>2</sub> eq. emissions per hectare		Introduction of regulatory taxes on fossil carbon carriers	Action level 1
	Flanking instruments Over-arching or sectoral	Support for R&D	Support for information and communications	
Carbon trading		Directives, bans and special regulations	Direct financial support	3
Voluntary measures		Targets and quotas	4	

Source: nova-Institut 2010

# The biobased economy and the CAP

- Agricultural Investment Support
- Development of good farming practices

Thank you for your attention!