



XXV. Encontro Econômico Brasil-Alemanha 2007  
XXV. Deutsch-Brasilianische Wirtschaftstage 2007

# Workshop 3

## Agro-energéticos e a Biomassa

### Biotreibstoffe / Biomasse

Ansgar Wille  
BASF AG

Blumenau, November 19<sup>th</sup> 2007





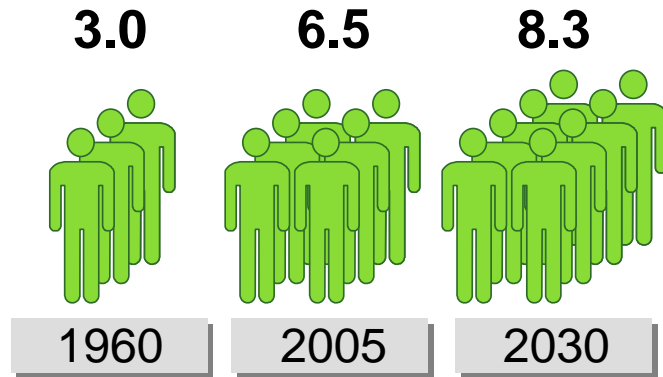
# Germany & Brazil Entangling Economy and Academia in Agribusiness and the Energy Sector

German-Brazilian Economic Forum, Blumenau/SC  
18. – 20. November 2007

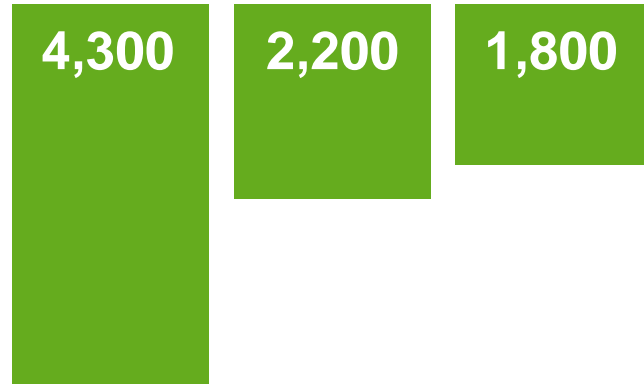
Ansgar Wille – Agricultural Products  
BASF Aktiengesellschaft

# Less Land for More People...

Population  
[billion]



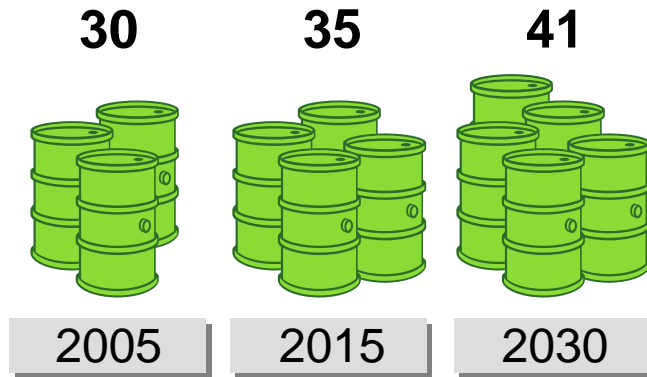
Available  
arable  
land per  
capita  
[m<sup>2</sup>]



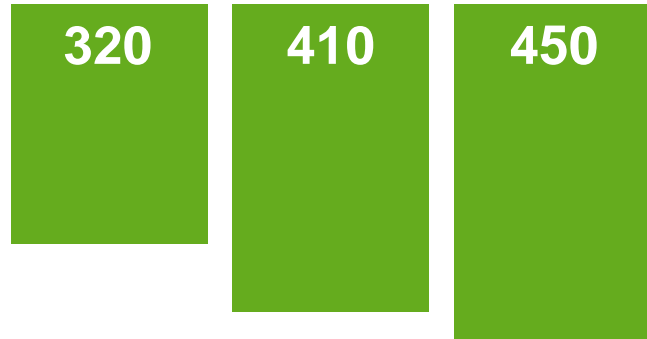
➔ Arable land per capita is decreasing dramatically

# ...Demand for Energy Increases Rapidly

World oil demand [billion barrels]



Arable land needed to substitute 10% of total oil demand [million ha]

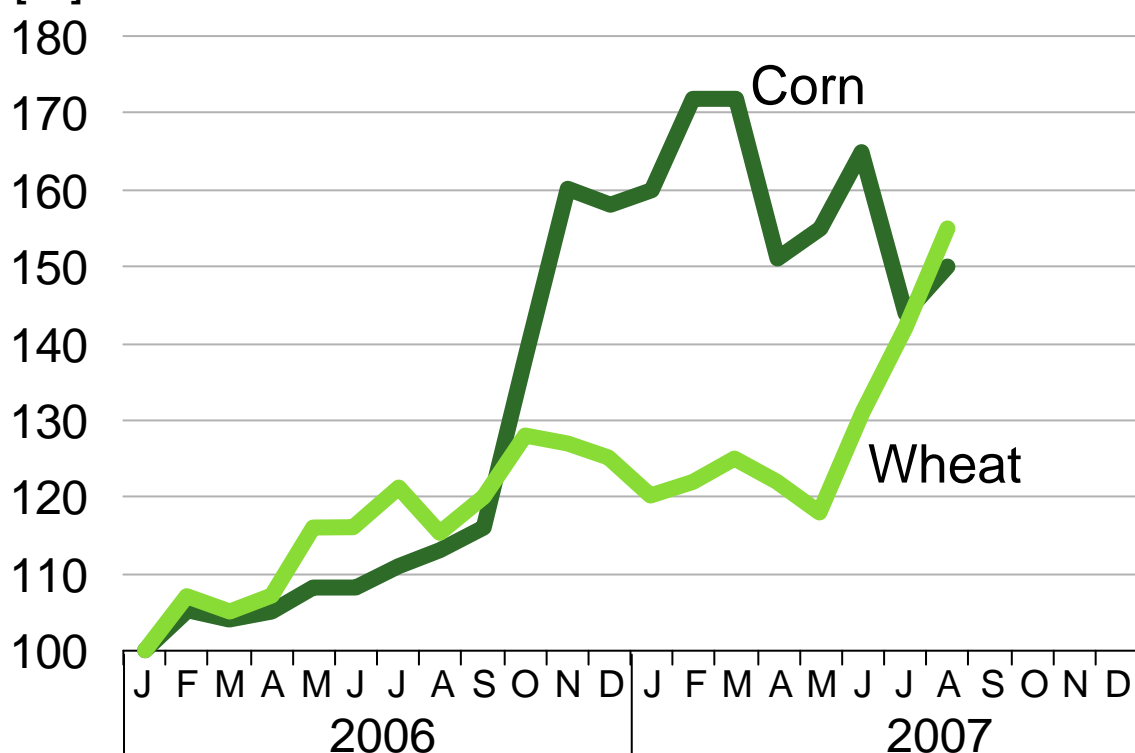


- Increases in crude oil price make biofuels economically more attractive
- Focus on climate protection raise the prospects for renewable resources

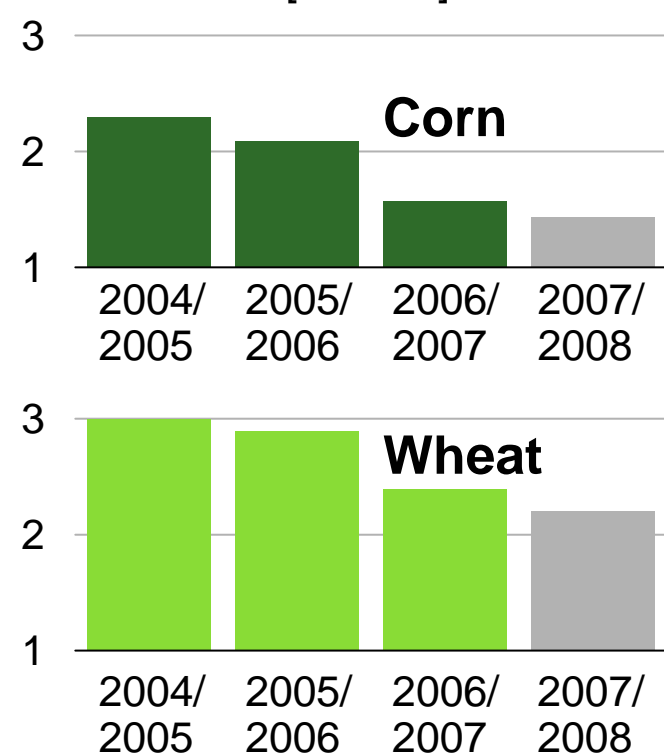
→ **30% of global arable land\* is needed to cover 10% of the world's oil demand in 2030**

# ...Crop Prices for Wheat and Corn 2006 – 2007 as an Indicator

[%] Prices USDA/Jan 2006 = 100%



Global stocks [months]



➔ **Global stocks at historic low levels – with respective price effects**

# Challenges for Agriculture: Balancing Act between Demanding Markets

## Streams of Renewable Raw Materials today

Agriculture



95% Food Sector



5% Non-Food

Chemicals



Energy



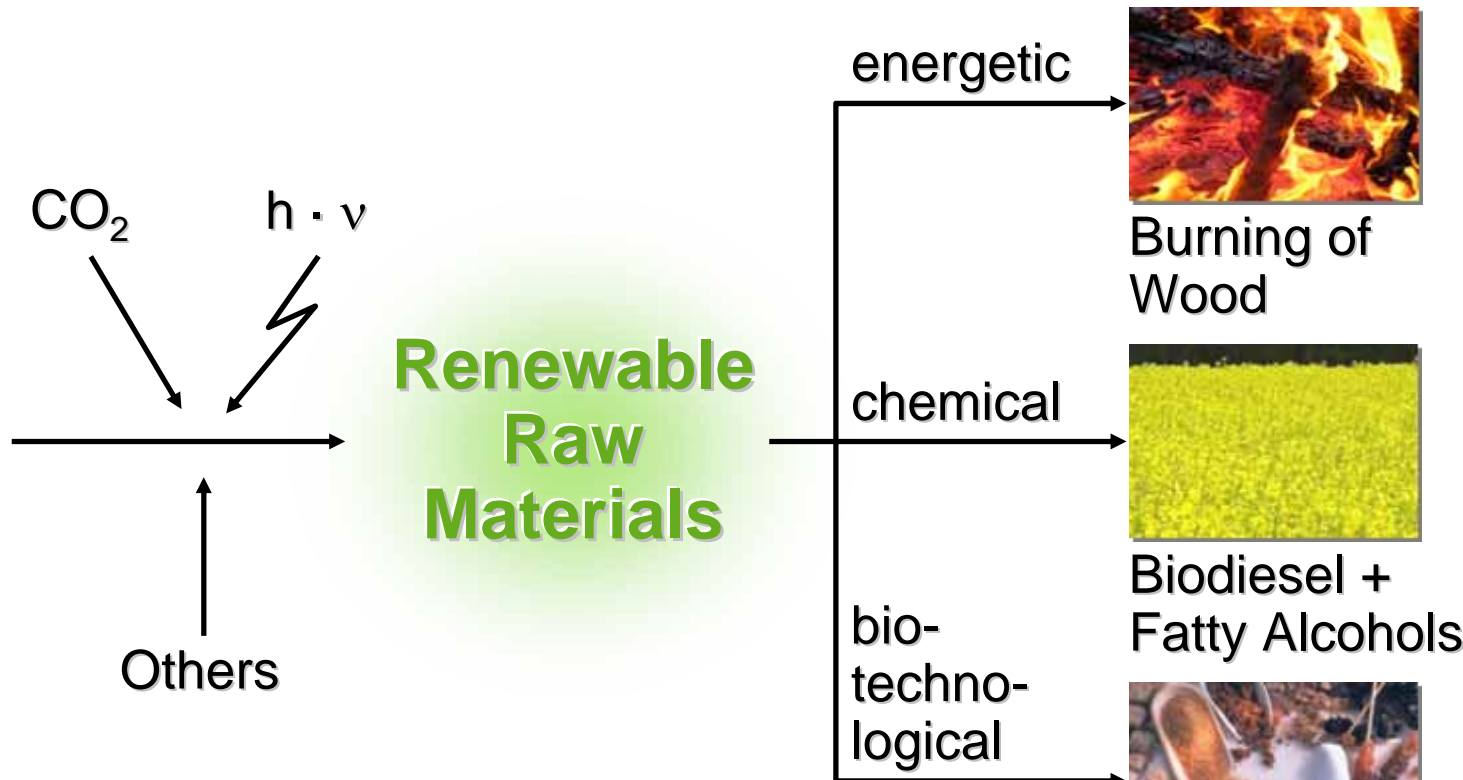
**Growing demand on  
both sides**

**⇒ Connection of  
Food with Energy  
prices**

# Growth Cluster Renewable Raw Materials: More and Cost-efficient Materials for the Industry



Nature



➔ Utilization of Renewable Raw Materials for the  
Production of Energy and Chemicals

Ethanol +  
Polymers

# Intensify Efforts in Research & Development Processes to get to Cellulosic Ethanol



Pretreatment

Cellulase digestion

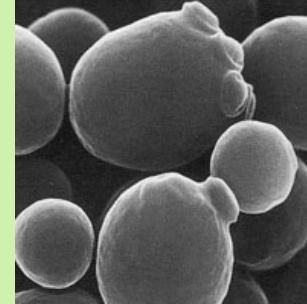


Amylase digestion

Sugars

Fermentation

Distillation



Existing processes for starch ethanol

# Process improvements expected By the Use of White and Green Biotechnology



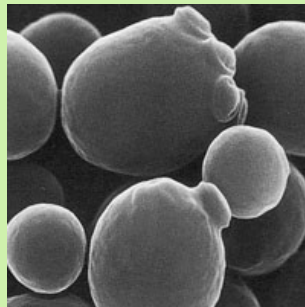
More yield



Easier/cheaper pretreatment



Integrated digestion & fermentation



e.g. yeast producing digestion enzymes

No distillation?



# Agribusiness as Engine for the Brazilian Economy

**For continuing the development of Brazil's leading position, it should consider:**

- Significant investments into its infrastructure
- Continuity of financial austerity and overall political-economical stability
- Expansion of the Agribusiness value chain
- Employment of modern technology to further increase productivity and utilization of field crops
- Employ means of ensuring sustainability and preservation of biodiversity

**→ Make use of chances for the German Economy – Investments into the areas of biomass and bioenergy in Brazil**

# Agribusiness in Brazil as Partner for German Companies

**Possibilities for cooperation & investment along the value chain of Agribusiness are multiple and promising:**

- Commercialization of agricultural technology (tractors, machinery)
- Upgrading of the Brazilian infrastructure (roads, rail, utilities)
- Logistics (systems)
- Processes in Sustainability (certification and traceability)
- Processing of raw materials (production of goods)
- Plant engineering and construction (downstream value adding)
- Cooperation in technology for future uses of the vast Brazilian basis of raw materials (biotechnology)

# Growing the biomass basket

- Brazil and the EU set ambitious targets in the field of using renewable raw materials
- These targets can only be reached by intensifying R&D efforts
  - Deepen networking of industry, academia and public R&D institutions
  - Set the legislative frame for employing biotechnology
- The steadily increasing demand for field crops, which compete in the food and non-food sector, can only be supplied by means of significant yield improvements from existing agricultural lands (biotechnology)

# Growing the biomass basket

- Biomass production, extraction and commercialization shall be sustainable (traceability, certification procedures)
- Utilization of ligno-cellulose (whole plant) for the production of transport energy and industrial goods shall be promoted, existing potentials must be leveraged
- The development of non-food crops (e.g. miscanthus and switchgrass) need to be prioritized in order to become independent from food sources



The Chemical Company