National Support Policies for Industrial Biotechnology and the Bioeconomy Case Study: Germany and Nordrhein-Westfalen

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What is the Knowledge-Based Bio-Economy offering?

• **Improved health**
  - Food with improved nutritional value, increased food safety, new treatments, diagnosis and vaccines against human and animal diseases, improved feed…

• **Sustainability and a cleaner environment**
  - Energy and water saving production and processes in agriculture and industry; decreased dependence of fossil resources;

• **Support to rural development**
  - Use of “set-aside” land; cultivation of new crops; decentralised production facilities

• **Increased industrial competitiveness through innovative eco-efficient bio-based products**
How is KBBE implemented in various EU Member States?

3 Different Stages of Implementation of KBBE:

• **Integrated concepts and strategies** with different levels of integration (AT, BE, DE, IR, NL, DK, NO)

• **No integrated strategies** BUT specifically KBBE-related policies and activities (CZ, FR, SE, UK, IT)

• More or less **no specific activities and policies**, but acknowledgement of its political importance and potential (EE, GR, LT, SI, PT)
Integrated KBBE Concepts - Germany

- “Cologne“-Paper - „En route to the Knowledge-Based Bio-Economy“ during the German EU presidency in 2007
- Several Calls for Proposals with direct KBBE references
- High-Tech Initiative of the German Federal Government, linking with the KBBE-concept
- National Bio-Economy Technology Council, directly reporting to the Chancellor
- Explicit reference to the KBBE and the need for its establishment with the support of the National Bio-Economy Technology Council in the Coalition Agreement of the new German government
• Publication of a relevant report on further developing the Bioeconomy in Germany by the National Bioeconomy Council on the 8th of September 2010 in Berlin

• Approval of the first National Strategy on the Bioeconomy for Germany in the formate of a Framework Programme by the Federal Government on the 3rd of November 2010
Selected current Calls for Proposals with direct reference to KBBE in Germany

Federal Ministry of Education and Research:

- **Competence Networks** in Agricultural and Food Research
- **Bioenergy 2021**
- **BioIndustry 2021**
- Industrial Genome Research on Microorganisms (**GenoMik-Industry**)
- **SynRG** – Systems Biotechnology for sustainable resource production
- “Transnational **PLant Alliance for Novel Technologies - towards implementing the Knowledge-Based Bio-Economy in Europe**" (**PLANT-KBBE**) – Cooperation between DE-FR-ES-PT
- **Excellence Cluster Competition**
- Breeding research and Breeding for energy plants
- Support of the use of biomass for energy
- Nutrition research for a healthy life
Federal State Ministry of Innovation, Science, Research and Technology NRW:

- **Bio.NRW** - Industrial Biotechnology

ERA-NETs (with strong German participation):

- ERA-NET “Bioenergy”
- ERA-NET “Industrial Biotechnology”
- ERA-NET “Plant Genomics”
- ERA-NET “Eurotrans-Bio”
Example Agro cluster
- up to 40 Mill. € / 5 years

- **Competence Network Food Chain Plus (FoCus),** (coordinator: Univ. Kiel)

- **Phänomics** – a systems biological approach for geno-phenotype mapping in the context of performance, health and wellness of the companion animals cattle and swine (coordinator: Univ. Rostock)

- Complex sensor technology for agricultural crop research, breeding and canopy controlling: **CROPSENSe** (coordinators: Univ. Bonn, Forschungszentrum Juelich)

- **Synbreed** – Innovation cluster for synergistical plant and animal breeding (coordinator: TU Munich)
Decision of the EU-Commission – Lead Market Initiative for Europe Dec. 2007

6 Lead markets identified:

1. eHealth
2. High Tech Textiles
3. Sustainable Construction
4. Recycling
5. Biobased Products
6. Renewable Energy
Biobased Products

Definition: Products of renewable, biological plant resources

Bottlenecks:

- Delays in public acceptance because of uncertainties regarding product properties
- Unsatisfactory transparency of market

→ Demonstration plants are essential for higher acceptance and transparency!
Report Ad hoc-Advisory group for Biobased products (11-2009)

Recommendations from Advisory Group

**Product-specific legislation**

- Allow bio-based plastic in composting, recycling and energetic recovery
- Packaging materials in energy recovery can be recognised as a CO$_2$ reduction
- Improve the knowledge among users about bio-lubricants => standards and info on properties
- Mandate use of bio-lubricants and hydraulic fluids in environmentally sensitive areas
- Bio-based construction materials should be “promoted” by Construction Products Directive; or alternatively, develop new ENs for construction products?

Source: Tomas Jonsson (DG Enterprise and Industry)
Action Plan on Biobased Products for Germany?

- A relevant study and analysis was contracted out by the Federal German Ministry for Economics and Technology on the necessary actions and follow-up with respect to the EU Lead Market Initiative.
- This study is performed by Fraunhofer Institut für System- und Innovationsforschung (ISI) to identify in particular the market potential for biobased products, with special emphasis on SME’s in Germany.
- The study shall also offer the necessary range of political options and decisions for the Federal German Government.
- Results expected beginning 2011.
KBBE Implementation in North-Rhine Westfalia - Some reflections
### Bio-Economy Turnovers 2006 in Manufacturing Trade in NRW

<table>
<thead>
<tr>
<th>Industry</th>
<th>Turnover (Billion €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Products</td>
<td>52.7</td>
</tr>
<tr>
<td>Rubber &amp; Plastic Goods</td>
<td>13.1</td>
</tr>
<tr>
<td>Paper Trade</td>
<td>8.1</td>
</tr>
<tr>
<td>Wood Trade</td>
<td>3.4</td>
</tr>
<tr>
<td>Food Trade</td>
<td>30.2</td>
</tr>
<tr>
<td>Textile Trade</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Total Manufacturing</strong></td>
<td><strong>26.6</strong></td>
</tr>
</tbody>
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At least 30% of Manufacturing Trade in North-Rhine Westfalia is based on Bio-Economy

Source: Trade report 2007 – Food Economy in Figures – MUNLV, Germany

75% of Chemical Intermediates in Germany come from NRW (20 bill. €)
KBBE activities in NRW-1

• Installation of 16 specific clusters by the Government of North-Rhine Westfalia (i.e. on Chemistry, Biotech, Energy, Plastics) with strong links of content towards KBBE

• Foundation of a Cluster of Industrial Biotechnology (CLIB2021) in NRW with funds of about 20 Mio. € by the Federal Government

• Foundation of an umbrella organisation “Bio.NRW” for bundling and linking-up of 8 various Bio-Regions in NRW, now speaking with one voice!

• Installation of a “local” agency for Bio.NRW by the State Government
KBBE activities in NRW-2

- Establishment of an KBBE Coordination Office for better coordination and streamlining of KBBE-activities in NRW
- Establishment of a competence cluster “Agro.NRW”
- NRW Stake-holder take part in the National Technology Council for Bio-Economy, founded by the Federal Republic of Germany in 2009
- Analysis of the potential of biobased products, processes and technologies in NRW
Key Facts of NRW

NRW’s share of Germany
Area: 34 000 sq km (9.5 %)
Population: 17.9 Mio. (21.8 %)
GDP: 521,7 bn EUR (21.5 %)

Highest concentration of universities
~ 300 life science companies

No. 1 pharmaceutical and chemical industry location
Creating a Roadmap to implement a Knowledge-based Bio-Economy in North Rhine-Westphalia

**Priority areas for establishing a bio-economy in NRW**
- Integrated biorefinery
- Biopolymers
- Diagnostics
- Biopharmaceutical products
- Bio-functional materials and surfaces

**Identification of most relevant industrial branches in NRW in terms of**
- Economic power in NRW
- KBBE capability
- Innovation performance
- Market attractiveness

**Biomedicine**

**Chemical industry**

**Energy supply industry**

**Vehicle construction**
Roadmap for future KBBE in NRW

- **Framework conditions**
  - e.g. supporting all measures (legislative, financial, institutional, infrastructure, etc.) enabling KBBE implementation

- **Strengthening of knowledge base**
  - e.g. fostering interdisciplinary research and cooperation

- **Strengthening implementation in companies**
  - e.g. strengthening technology transfer and information exchange

- **Communication**
  - e.g. creating a communication concept towards the public

- **Organisation**
  - e.g. focussing and aligning activities for KBBE in NRW

- **Fields of action for NRW**
  - e.g. supporting all measures (legislative, financial, institutional, infrastructure, etc.) enabling KBBE implementation
KBBE activities in NRW-3

- Call “Food” (2008), 10 Mill.€
- 1st call “Energy.NRW” (3 pillars; 3rd pillar: “Biological production of energy sources” with 3 elements:
  - Efficient crop cultivation to ensure the need of raw materials
  - Biorefineries – Production system of the 21st century
  - Knowledge-based bioeconomy
- Call “Forest and Forestry” being planned
KBBE activities in NRW-4

• 2nd call „Bio.NRW“ (09-2009) with a focus on red biotechnology
  – Development of new diagnostics and therapies for
diseases with high societal and demographic impact, like
cardiovascular and neurodegenerative diseases, cancer,
diabetes
  • Analysis and diagnostics
  • Process development and production of new agents
  • New technologies

• 2nd call “Energy.NRW” (12-2009), 3rd pillar on bioenergy:
  – Increase of efficiency of plant production
  – Total use of all herbal resources
  – Efficient interlocking of all participants within the
economic system
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Thank you for your attention