BASF growth clusters
We innovate for growth
Stefan Marcinowski
1 | Megatrends for chemical innovation
2 | BASF’s research & development
3 | Where we are coming from
4 | Where we are heading to
Global megatrends underpin innovation efforts

- Growth and aging of the world population
- Urbanization and metropolization
- Energy demand and climate impact
- Economic globalization and emerging markets

**Megatrends**

- Health & Nutrition
- Housing & Construction
- Energy & Resources
- Mobility & Communication
1 | Megatrends for chemical innovation

2 | BASF’s research & development

3 | Where we are coming from

4 | Where we are heading to
R&D key facts and figures 2006

- 80% of R&D financed by operating divisions
- 20% corporate research reported under “Other”
- 74% of R&D expenditures in Germany, 17% in North America
- More than 8,000 employees at 70 R&D sites world-wide
- R&D Verbund extends to 1,400 co-operations, thereof over 40% with industrial partners
- Portfolio of more than 120,000 patents

R&D expenditures: 1.3 billion Euro
R&D for product innovation in 2006: >750 million Euro

Product innovations are new or improved products or new applications, max. 5 years on market

More than 900 R&D projects managed by PhaseGate process

10-20% of sales from product innovations will be annual top-line growth

Targeted annual sales from product innovations

<table>
<thead>
<tr>
<th>Year</th>
<th>Targeted Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>4 billion Euro p.a.</td>
</tr>
<tr>
<td>2015</td>
<td>5 billion Euro p.a.</td>
</tr>
</tbody>
</table>

PhaseGate process to steer R&D

Opportunity fields → Business cases → Lab phase → Pilot phase & launch
1 | Megatrends for chemical innovations

2 | BASF’s research & development

3 | Where we are coming from

4 | Where we are heading to
Innovation makes the difference

<table>
<thead>
<tr>
<th>Competitive advantages through R&amp;D</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Leapfrog technologies for basic building blocks</td>
<td>HPPO-process, Biobased-MPG</td>
</tr>
<tr>
<td>Process technologies to keep Verbund flexible and cost efficient</td>
<td>Citral, CDon</td>
</tr>
<tr>
<td>New products with breakthrough mode of action</td>
<td>Fungicides, Ultradur® High Speed</td>
</tr>
<tr>
<td>System solutions with high impact for our customers</td>
<td>Elastocoast® Oilfield chemicals</td>
</tr>
<tr>
<td>Cooperation with customers along the value chain with adapted business models</td>
<td>CMPs GTL-Catalysts</td>
</tr>
</tbody>
</table>
Polyurethanes (PU) are used for plastics and foam manufacturing. Propylene oxide through direct oxidation of propylene:

- Proprietary technology
- Highly cost efficient process
- No by-product
- Reduction of waste water by 70-80%
- Reduction of energy usage by 35%
- Next projects in Asia under consideration

**Innovative process for propylene oxide**
Key step in backward integration of polyurethane-business

- Chlorohydrine Process
  - waste: 1.1 t salt
  - by-product: 1.5 t NaOH

- SMPO Process
  - by-product: 2.3 t styrene

- Direct Oxidation – HPPO
  - no by-product

- PO: Key-intermediate in polyurethane value chain
- SMPO: Styrene monomer propylene oxide
- HPPO: Hydrogen peroxide propylene oxide
Success story fungicide business
Long-term strategy of product innovation pays off

Profitable growth through blockbuster innovation in fungicides business:
• 1993: Epoxyconazole
• 1995: Kresoxim methyl strobilurine
• 2002: F 500 strobilurine
• 2003: Boscalid

Continuous research on next generation active ingredients to drive long-term profitable growth
### Powerful agrochemical R&D pipeline

<table>
<thead>
<tr>
<th>Stage</th>
<th>Projects</th>
<th>Major crops/markets</th>
<th>Peak sales potential</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In launch</strong></td>
<td>4 Fungicides</td>
<td>Cereals, soybeans, specialty crops</td>
<td>1,000 Million Euro*</td>
</tr>
<tr>
<td></td>
<td>2 Herbicides</td>
<td>Cereals, corn</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Insecticide</td>
<td>Non-crop</td>
<td></td>
</tr>
<tr>
<td><strong>In development</strong></td>
<td>4 Fungicides</td>
<td>Cereals, specialty crops</td>
<td>800 Million Euro</td>
</tr>
<tr>
<td></td>
<td>1 Herbicide</td>
<td>Corn, non-crop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Herbicide</td>
<td>Soybeans</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tolerance</td>
<td>Specialty crops, non-crop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Insecticides</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Thereof 50% reached in 2006

- Product sales from patented actives highest in industry: over 50% of 2006 agrochemical sales
- Leading intellectual property position for BASF through successful commercialization of pipeline products
- Solid platform for generic defense and lifecycle extension
1 | Megatrends for chemical innovation

2 | BASF’s research & development

3 | Where we are coming from

4 | Where we are heading to
Growth Clusters
Cross-sectional technologies feeding our businesses

Megatrends
- Health & Nutrition
- Housing & Construction
- Energy & Resources
- Mobility & Communication

Growth Clusters
- Biology
- Chemistry
- Physics

Chemical relevant technology base
Focus on five growth clusters

<table>
<thead>
<tr>
<th></th>
<th>Business model</th>
<th>Product innovation</th>
<th>Process innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>Plant Biotechnology</td>
<td>White Biotechnology</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td></td>
<td>Raw Material Change</td>
</tr>
<tr>
<td>Physics</td>
<td>Energy Management</td>
<td>Nanotechnology</td>
<td></td>
</tr>
</tbody>
</table>

- R&D expenditures for growth clusters more than 900 million Euro from 2006 – 2008
- In 2006, approx. 30% funded by divisions, 70% corporate funded
- First projects out of growth clusters to come to market by 2007

Targeted annual sales from growth clusters

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0.5-1 billion Euro</td>
</tr>
<tr>
<td>2015</td>
<td>2-4 billion Euro</td>
</tr>
</tbody>
</table>
Growth Cluster
Plant Biotechnology

Example
High yield and stress tolerance traits

Partner
Monsanto
Yield and stress tolerance traits
The single most promising opportunity in agriculture

4F – drivers of agricultural innovation

• **Food**
  Latest UN estimate on growing world population projects
  9.2 billion people for 2050

• **Feed**
  Rising social standards drive global demand for more processed
  food, especially for meat consumption in Asia

• **Fiber**
  Cotton is the single most important textile fiber in the world,
  accounting for about 40% of all fibers produced

• **Fuel**
  Use of grain for fuel is growing by roughly 20% per year

**Market potential**

• In 2006, the US corn harvest alone was worth about
  34 billion USD

• Research target: at least 10% yield increase
Collaboration of BASF and Monsanto creates unified focus on yield

**Discovery**
- Monsanto discovery program
- BASF discovery program

**Development**
- Licensed brands
- Regional brands
- National brands
- American Seeds Inc.

**Commercialization**
- Uses Monsanto’s three commercial channels
- Value shared 60% Monsanto, 40% BASF

**Collaboration creates intensified yield & stress tolerance pipeline**
- Step up volume of lead genes
- Develop stream of successive updates to create a ‘family of products’ in each crop
- Increase certainty of commercial success
- Focus on corn, soybeans, cotton and canola

**Structure**
- Maintaining independent discovery programs
- Projects nominated for development to jointly managed board
- Jointly funded at 50/50
- Potential USD1.5/Euro1.2 billion R&D budget
- Harnesses Monsanto’s infrastructure
- Potential USD1.5/Euro1.2 billion R&D budget
- Harnesses Monsanto’s infrastructure
Growth Cluster
Energy Management

Example
Fuel cells

Partner
Ultracell
Energy Management
Enabling viable energy supply strategies

Life cycle of technologies for primary energy supply

- Increase of global primary energy demand from 84 bn to 128 bn barrel OE in 2030*
- Target: Develop innovative materials and solutions to enable systems that meet demand for portable and sustainable energy supply
- Fuel Cells generate electrical energy and heat from hydrogen, methanol or hydrocarbons
- Development of photovoltaic as economically viable renewable energy supply

* Source IEA 2006
Fuel cells
Business development in value chain

BASF sales target: 150 – 200 million Euro in 2015

Fuel-cell benefits:
- High energy density
- No charging time
- Low noise

Innovation drivers:
- Cost reduction
- Lifetime improvement
- System miniaturisation

Product development:
- Catalyst development
- Membrane electrode assemblies (MEA)

Development partners:
- Aisin, Honda, MTI Micro, Nissan, Plug Power, Samsung, Sony, Tatung, Toyota, Ultracell

BASF activities

<table>
<thead>
<tr>
<th>Catalyst</th>
<th>Membrane</th>
<th>MEA*</th>
<th>Stack</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Portable</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stationary</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Automobile</td>
<td>500</td>
</tr>
</tbody>
</table>

Market volume* by 2015 in million Euro

* Catalyst, membrane and membrane electrode assembly
Growth Cluster
Nanotechnology

Example
Organic Light Emitting Diodes

Partners
OSRAM, Philips
**Nanotech enables product innovation**
BASF generates 250 million Euro in sales with nanotech products

<table>
<thead>
<tr>
<th>In development</th>
<th>Time to market</th>
<th>In launch</th>
<th>Application</th>
<th>Development partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mincor® Technology</td>
<td></td>
<td>Textiles</td>
<td>Ten Cate</td>
<td></td>
</tr>
<tr>
<td>Col.9® Technology</td>
<td></td>
<td>Paint</td>
<td>AKZO</td>
<td></td>
</tr>
<tr>
<td>Z-Cote® Technology</td>
<td></td>
<td>Cosmetics</td>
<td>Shiseido</td>
<td></td>
</tr>
<tr>
<td>High-Speed Technology</td>
<td></td>
<td>Parts</td>
<td>Molex</td>
<td></td>
</tr>
<tr>
<td>ISITECT® Technology</td>
<td></td>
<td>Insulation</td>
<td>ISIS*</td>
<td></td>
</tr>
<tr>
<td>Printed Electronics Tech.</td>
<td></td>
<td>Electronics</td>
<td>Polyera, Rieke Metals, ORFID</td>
<td></td>
</tr>
<tr>
<td>OLED Technology</td>
<td></td>
<td>Lighting</td>
<td>Philips, Osram, Applied Films</td>
<td></td>
</tr>
</tbody>
</table>

**BASF sales target with nanotech products: > 500 million Euro in 2010**

* Institut de Science et d’Ingénierie Supramoléculaires, Strasbourg, France*
Growth Cluster
White Biotechnology

Example
Performance biologicals

Partners
Leading consumer-care players
Performance biologicals
Cooperations with leading players in consumer care

We learn from nature…

… and put it into practice

BASF sales target with new classes of performance biologicals:
> 100 million Euro in 2015
Growth Cluster
Raw Material Change

Example
Monopropylene glycol from glycerol

Partner
“BASF”
Broadening our feedstock base
Flexibilizing our value-adding chains

Target
• Develop process innovations that enable alternative raw materials in our value-adding chains

Examples
• Propylene glycol from glycerol
• Processing renewable resources with ionic liquids
• Exploring syngas-based value-adding chains
Changing feedstock from propylene to glycerol: bio-based MPG

Product: Monopropylene glycol (MPG)
- Broad application spectrum: polyester resins, engine coolants, household industry
- Current technology propylene-based
- Market: 1.9 million tonnes p.a. in 2015
- Market growth: 3-4% p.a.

Raw Material: Glycerol
- Byproduct from biodiesel production
- Favourable supply/demand balance expected

Advantages of BASF technology:
- Proprietary catalyst technology
- High quality product which meets all existing specifications

Outlook:
- Decision on investment in 2007 / 2008
- 100% utilization within 2 years after start-up
BASF: We innovate for growth!

- Innovation makes the difference. We have a powerful innovation engine in place.
- We match the megatrends with our technology competence: energy management, raw material change, nanotechnology, plant biotechnology and white biotechnology.
- By 2015 we will generate annual sales of 2-4 billion Euro as topline growth out of this cluster.
- We invest more than 900 million Euro in these growth clusters from 2006 – 2008.
- We realize innovation faster and with higher success rates by strategic partnering.
Disclaimer

This presentation contains forward-looking statements under the US Private Securities Litigation Reform Act of 1995. These statements are based on current expectations, estimates and projections of BASF management and currently available information. They are not guarantees of future performance, involve certain risks and uncertainties that are difficult to predict and are based upon assumptions as to future events that may not prove to be accurate.

Many factors could cause the actual results, performance or achievements of BASF to be materially different from those that may be expressed or implied by such statements. Such factors include those discussed in BASF’s Form 20-F filed with the Securities and Exchange Commission. We do not assume any obligation to update the forward-looking statements contained in this presentation.
Glossary

- **CDon**  Cyclo-Dodecanone, precursor for engineering plastics and flavour and fragrances
- **Citral** raw material for fragrances and flavors, vitamin A and E, and carotenoids
- **CMP**  Chemical Mechanical Planarization, applied in electronic industry
- **GTL-Catalysts** gas to liquid catalysts
- **HPPO** Hydrogen peroxide propylene oxide
- **LB**  Lactobacili, micro organism known from food fermentation and preservation, e.g. in yogurt, sauerkraut or cheese
- **MPG** mono-propylene glycol
- **OLED** organics light emitting diode
- **PO**  propylene oxide
- **PU**  polyurethanes
- **SMPO** coupled styrene monomer / propylene oxide production process