Creating Chemistry for a Sustainable Future

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Sustainability Leader
BASF Corporation
BASF – The Chemical Company
2010 snapshot

- The world’s leading chemical company
- Serves all major industries
- Production facilities on six continents
- World-class, innovative, high-value products
- Intelligent, sustainable system solutions
- 2009 Sales: $70.5 billion
- Employees: 105,000+
BASF in North America

Sales 2009: $12.9 billion
Employees: 16,000+
Prod. Sites: 100+
R&D Sites: 20

Key Customer Industries
- Agriculture
- Automotive
- Chemicals
- Coatings
- Construction
- Health and Beauty
- Packaging
BASF’s Four Strategic Pillars

Ensure sustainable development

Help our customers to be more successful

Form the best team in industry

Earn a premium on our cost of capital
Sustainability balance

Ecology

Economy

Social Responsibility

Sustainable Development
Climate change and its influence on BASF

**Regulatory Changes**
- Efficient production processes
- Technologies to abate GHG emissions
- GHG-intensive technologies
- Inefficient production method

**Climatic Changes**
- Competitive advantage
- Growing markets
- Adaptable sites and production processes
- Technologies to adapt to climate change
- Endangered sites (including customer and supplier industries)

**Opportunities**
- Shrubbing markets
- Financial burdens (i.e. by regulation)
Sustainable Development as a path to long-term business growth

- Integrate sustainability into customer relationships
- Open up new markets and target audiences
- Develop tailored solutions
- Reduce risk to reputation
- Clear and forthcoming communication
Providing solutions for the global challenges of the future

**Transportation & Communication**
- 2 billion cars will be on road worldwide by 2030
  - How can we reduce emissions and fuel consumption?

**Construction & Housing**
- 60% of the world population will live in cities by 2030
  - Which materials are needed to make energy consumption more efficient?

**Health & Nutrition**
- 8 billion people will live on earth by 2030
  - How can we ensure food and water supply for everyone?

**Energy & Climate**
- 40% more primary energy will be needed by 2030
  - How can we contribute to climate protection and energy supply?
Board-level Accountability

Executive Board BASF SE

Sustainability Council
Headed by a Member of the Board

Project team

Sustainability Center

Regional Steering Committees
Asia, North / South America, Europe

Climate Protection Officer
Sustainability: a bottom-line business imperative
Environmental & Safety Excellence
Global Safety Culture: Safety Champions

Visible leadership
- Lead on!

Integration of employees
- Join in!

Personal responsibility
- Look out!

Open dialogue
- Speak out!

“Zero Incident Mindset”
Commitment beyond compliance

Product stewardship

- We ensure that our products pose no danger to people or the environment when they are used responsibly and in the manner intended.

- Support of the ICCA Global Product Strategy (GPS), aiming to harmonize global safety standards

- First stage of REACH* registration now underway

- Estimated costs of €50 million annually until 2018

*REACH = Registration, Evaluation, Authorization and Restriction of Chemicals
## Pursuing aggressive Environment, Health and Safety goals

<table>
<thead>
<tr>
<th>Category</th>
<th>Goal 2020</th>
<th>Status 2009</th>
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<tbody>
<tr>
<td><strong>Distribution safety</strong></td>
<td></td>
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<tr>
<td>Reduction of transportation accidents</td>
<td>– 70%</td>
<td>– 57.0%</td>
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<td>(baseline 2003)</td>
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<tr>
<td><strong>Occupational safety</strong></td>
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<tr>
<td>Reduction in lost time injury rate per million working hours</td>
<td>– 80%</td>
<td>– 46.5%</td>
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<tr>
<td>(baseline 2002)</td>
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<tr>
<td><strong>Reduction in emissions from chemical operations</strong></td>
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<tr>
<td>Emissions of air pollutants</td>
<td>– 70%</td>
<td>– 63.5%</td>
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<td>(baseline 2002)**</td>
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<td></td>
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<tr>
<td>Emissions to water of (<strong>baseline 2002)</strong></td>
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<tr>
<td>– Organic substances</td>
<td>– 80%</td>
<td>– 79.7%</td>
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<tr>
<td>– Nitrogen</td>
<td>– 80%</td>
<td>– 83.9%</td>
</tr>
<tr>
<td>– Heavy metals</td>
<td>– 60%</td>
<td>– 61.4%</td>
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<tr>
<td><strong>Product stewardship</strong></td>
<td></td>
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<tr>
<td>Perform risk assessments of all BASF products</td>
<td>&gt; 99%</td>
<td>&gt; 23%</td>
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<tr>
<td>sold worldwide in quantities of more than 1 metric ton/year</td>
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**BASF**

The Chemical Company
Two decades of increased production and reduced emissions

1990

Kyoto

Total Production Volume

+86 %

Absolute GHG Emissions

-27 %

GHG emissions per product volume

-61 %

2009
The Energy Verbund

Steam export

Power plant

Steam import

Sulfuric acid plant

Adipic acid plant

Urea/carbamide plant

Acrylic acid plant

Office building

Annual savings* BASF Group:

Primary energy: 1.6 mill. toe

CO₂ emissions: 3.7 mill. t CO₂

* Comparison: Conventional power and steam generation in separate plants based on natural gas.
Measuring Sustainability

- Sustainability Screening Tool

- Impacts on environment
- Life Cycle Inventory
- Carbon Footprint
- Total Cost of Ownership
- Costs from cradle to grave
- Impacts on environment and costs
- Life Cycle Assessment
- Eco-Efficiency
- SEEBALANCE®

Impacts on environment, costs and society
Eco-Efficiency Analysis

- Exclusive BASF life-cycle analysis of products and processes – weighs economic and ecological factors
- Widely accepted worldwide by universities, governments and companies as an accurate measure of the sustainability of products and processes
- Determines which technology is best suited, environmentally and economically, for any particular application
- More than 400 analyses completed (internally and for BASF customers)
A Life-cycle Approach

Raw Materials and Energy Production

Production Basic
Chemicals

Recycling/Disposal

Production End-Products

Use Phase
Eco-efficiency Analysis: Accounting for all points on the life-cycle

Environmental impact over the entire life cycle

**Consumption of Energy**
- Cumulative energy utilization plus remaining energy content
- Fossil and renewable resources are included

**Emissions**
- Described by categories
  - Air
  - Water
  - Solids

**Toxicity Potential**
- Definition for hazardous materials used by EU law
- Maximum possible hazard used

**Risk Potential**
- Risk assessment approach
- Based on published statistical data (e.g. insurance associations)

**Consumption of Raw Materials**
- Materials are weighted according to reserves and global consumption

**Land Use**
- Index calculated by assessment criteria and impact factors
Life-cycle data is gathered in six environmental categories and depicted on an ecological fingerprint. The data are then weighted and aggregated to obtain an overall environmental impact.
Eco-efficiency applied

Customer benefit:
1 functional unit for ....

The most eco-efficient product has the lowest environmental impact and cost. Eco-efficiency is measured from the diagonal line.

Alternative 3 is most eco-efficient.
BASF’s 3:1 Carbon Footprint study
Creating chemistry that reduces green-house gas emissions

Total GHG emissions related to raw materials, production and disposal of BASF products

Total GHG savings related to use of BASF products over their life cycle

287 million t CO$_2$e/a

Housing 248
Industry 14
Agriculture 13
Additional products 6

3:1

Total GHG emissions

Production of precursors 35
Direct and indirect emissions from BASF production 27
Disposal 25
Transport and business travel 3

Savings of CO$_2$ equivalents 2008
Emissions of CO$_2$ equivalents 2008
The Sustainability Consortium: Value chain collaboration for product sustainability

Developing transparent methodologies, tools and strategies to drive a new generation of products and supply networks.
Creating Chemistry for Sustainable Communities and Opportunities
Verbund /ˈvɜrˈboʊnt/  ▶ n. an interconnected system of relationships generating greater value than the sum of its parts. ▶ adj. characterized by the effective application of such relationships. ▶ from German as coined by BASF, late 20th cent.
Part of an inter-connected global community

- The well-being of people and communities across the globe is vital to sustainable business.
- Sustainable business as a sound investment opportunity for shareholders.
- Harnessing science to improve quality of life.
- Building a sustainable future through the advancement of science education among student, families, customers and business partners.
Science Education

- Contributes to economic opportunity
- Encourages the next generation of scientific innovators
- Contributes to long-term sustainability of BASF’s science talent pipeline
- Helps build familiarity and trust among parents
- Strengthens families and communities
Kids Lab
Elementary School Students

- Launched at Liberty Science Center in December 2009
- Expanding into sites in communities in conjunction with existing science education programs
Creating Value with Social Business:
*BASF Grameen Ltd.*

**BASF Grameen Ltd. in Bangladesh combines business sense with social needs.**

**Overall goal:**

Improve health and business opportunities of the poor in Bangladesh and generate a fundamental understanding of these markets within BASF.
Creating value through diversity
Building an inclusive global culture

**Diversity + Inclusion initiative:**

- Build a team with a broad spectrum of experiences, viewpoints, and experiences.
- Leverage and disseminate regional cultural strengths from across the global organization.
- Promote and facilitate harmonious collaboration and mutual respect.
Our employees – key to our success

- **Designed to Fit** flexible work arrangements
- Addressing demographic change with the Generations@Work program (knowledge transfer)
- Focus on talent development – empowering employees to set and achieve definite career objectives.
- **SIMPLY DARE** program encourages entrepreneurial spirit and innovation
Spreading the vision:
Helping business partners and customers grow sustainably

Goal

- Improve safety and reliability by supporting partners with best practices, expertise and customized solutions in sustainability

The 1+3 approach

- BASF passes on principles of sustainable development to three direct partners in value chain
- Companies introduce same model to three more business partners along their own supply chains
- The initiative started at the end of 2006 and encompasses 60 companies in China thus far
Sustainability: A fertile frontier of business opportunity
Solutions to great global challenges
A forward-looking focus on emerging industries

We create chemistry to help power, move, house and feed a growing world population

- Wind and Solar power
- Biotechnology
- Energy-efficiency
- Sustainable construction
- Water treatment
- Fuel Cell technology

About €400 million of BASF’s annual research expenditures go into energy efficiency, climate protection, and resource conservation
The Megatrends
Global challenges = Global opportunities

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Solutions for future nutrition
Megatrend Health & Nutrition

Plant Biotechnology

- Agricultural production to double in next 20-30 years, food for 8 billion people needed in 2030
- Use of grain for fuel growing by ~ 20% per year

Value for the environment and society:
- Improvement of global food supply in terms of quality and quantity
- Conservation tillage, reduction of soil erosion
- Improvement of land-use efficiency and better use of available water

*Expected goss trait sales before partner share in 2020*
Solutions for sustainable use of water
Megatrend Health & Nutrition

Water

- Global water consumption will almost double by 2025
- Major challenges: water scarcity, water quality

Filter membrane made of Ultrason®
- The filter membrane provides ultra filtration and removes viruses as well as bacteria from dirty surface water
- It is portable and able to purify at least 18,000 liters of water reliably without the need for batteries

Trilon® M
- A dishwashing tab based on Trilon® M produces 80% less wastewater load compared with phosphate-based formulations
Solutions for sustainable energy
Megatrend Energy and Climate Protection

Power generation
- Wind power
- Photovoltaics
- Fuel cells
- Thermoelectrics

Energy storage
- Cathode materials for Lithium ion batteries
- Double layer condensers

Efficient use of electricity
- Organic light emitting diodes
- Magnetic cooling
Solutions for more efficient housing
Megatrend Construction & Housing

- **COLO- FAST**® for solar panel frames
- **Micronal**® PCM latent-heat storage system
- **Neopor**® and **Rheocell**® for heat insulation
- **Walltite**® Sprayfoam for insulation of walls
- **Styrodur**® C for insulation of walls and floors
- **Lumogen**, **Paliogen** and **Sicopal** black pigments for cool surfaces
- **Elastopor**® H for insulation of ceilings, roofs and walls
- **HECK**® MultiTherm systems for insulation of walls (inside and outside)
- **X-SEED**® concrete hardener
Solutions for more efficient cars
Megatrend Transportation

**UV cured coatings**
high environmental compatibility, rapid coating processes

**Ultramid®**
for light-weight motor parts

**Terblend N® and Terluran®**
for high-quality plastic components

**Astacin®** leather finishes; low environmental impact

**Neopolen®**
for absorption of collision energy

**Lumogen® Black**
and **Sicopal® Black**
for heat reduction of dashboards

**Keropur®**
Fuel additives help reduce fuel consumption

**Catalysts**
for purification of exhaust fumes and reduction of air pollutants
A recognized global leader

FORTUNE
World’s Most Admired Company
Chemical Industry, 2010

Dow Jones Sustainability Indexes
Listed 2010

CARBON DISCLOSURE PROJECT
1st Place, materials sector, 2009

Included 4th consecutive year, 2010

Founding member
Recap:
BASF’s Fundamental Commitment to Sustainable Development

1. Strategic pillar
2. Life-cycle approach: measurement and transparency
3. Creating chemistry for a globally sustainable future