150+ years after the pitch – BASF’s innovation strategy

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In the beginning was an idea

Friedrich Engelhorn (1821-1902):
Founder of BASF on April 6th, 1865

- Coal tar / Aniline is a waste product from lighting gas production
- Discovered as input for a new industry, the synthetic dyes industry
- Engelhorn had been operating a lighting gas factory

Engelhorn spotted the **full potential** of synthetic dyes

BASF founded as a company active in the entire value chain, starting with raw materials via intermediates to final dyes
From a local start-up to a global player

1865: Modest beginnings –
- a integrated dye factory,
- sited in Mannheim (later: Ludwigshafen),
- with 30 employees.

2016: World-leading chemical company –
- the world’s largest integrated chemicals plant at Ludwigshafen,
- more than 113,000 employees and,
- sales activities and production sites worldwide.

Scale up Growth ever since then based on continuous innovations

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BASF – We create chemistry

- Our chemistry is used in almost all industries
- We combine economic success, social responsibility and environmental protection
- Sales 2016: €57,550 million
- EBIT 2016: €6,275 million
- Employees: 113,830
- 6 Verbund sites and 352 other production sites
BASF success stories of innovation

- Synthetic Dyes
- Fertilizers
- Plastics / Foams
- Health Care & Nutrition, Crop protection
- Systems

1900:
- Polystyrene

1930:
- Magnetic Tape

1934:
- U46 Herbicide

1949:
- Alizarin

1869:
- Indigo

1913:
- Ammonia

1923:
- Methanol

1936:
- Buna

1937:
- Polyethylene

1951:
- Syropor®

1963:
- Vitamin A

1974:
- Basagran® Herbicide

1990:
- Vitamin B2

1998:
- Neopor®

2000:
- Opus® Fungicide

1996:
- Strobilurine Fungicide

2006:
- Ecovio®

2013:
- Infinergy®; DroughtGard®; FWCTM Four-Way-Conversion Catalyst

2008:
- HPPO

2011:
- Xemium® Fungicide

2015:
- SLENTITE®
Innovations drive growth and enable other industries

Lightweight composites help to reduce weight in automobiles
(Composite market potential)

Legislation on reduction of CO₂ emissions in Europe
(Other countries such as Japan, South Korea, USA, China pursue similar trends)

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* CO₂ per km; ** Under discussion
Today’s innovations will be outdated tomorrow

Specialties and solutions
- Attractive markets
- Differentiation by customer proximity and innovations

Differentiated commodities
- Attractive markets
- Differentiation by process technologies and integration

Divestment of businesses, e.g., due to lower market attractiveness

Commoditization leads to restructuring

Divestment of businesses, e.g., due to loss of differentiation

Growth fields

Innovation pipeline

Acquisitions

~50% ~50%

target (in % of sales*)

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* Excluding Oil & Gas sales
Innovation for future growth

R&D expenditures 2016

- Corporate Research: 21%
- Oil & Gas: 2%
- Agricultural Solutions: 26%
- Chemicals: 10%
- Performance Products: 20%
- Functional Materials & Solutions: 21%

Key facts

- €1.86 billion R&D expenditures in 2016
- R&D expense to sales ratio ~3%
- ~10,000 employees in R&D
- ~3,000 projects
- ~850 new patents in 2016
Three technology platforms drive our R&D

Three Technology Platforms (HQ: Europe, N. America, Asia-Pacific)

Close connection to Operating Divisions

Global Know-How Verbund and global network (~ 600 universities, research institutions & companies)
BASF Innovation Approach

Focus on content, methods and structures

Research focus on topics that are strategically relevant for our business

New scientific processes and methods

Globalizing research and strengthening regional competencies
Tapping into the global know-how pool

BASF R&D sites with proximity to customers and markets

San Diego
Wyandotte
Research Triangle Park Bioscience Research
Iselin

Lemförde
Muenster
Germany

Amagasaki Japan

Suwon South Korea

Ludwigshafen Process Research & Chemical Engineering

Mumbai India

Around 70 BASF R&D sites globally

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Seven focus areas for R&D

Selected Key Technology Capabilities reflect where BASF requires continued effort and resources to safeguard todays and tomorrows excellence in innovation.

- Biotechnology
- Catalysis
- Materials
- Enabling Methods
- Polymer Technologies
- Production Processes
- Biodegradable & Biobased Materials

The Key Technology Capabilities are bundled in seven Focus Areas

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Making digitalization work

By integrating digital technologies into BASF’s everyday R&D operations we will boost effectiveness of research, increase efficiency and open up new innovation opportunities.

Focus areas:

- Scientific modeling and simulation based on high-performance computing
- Integrated data and knowledge management including statistical applications
- Cognitive approaches to derive knowledge
Starting up over and over again

Digitalization @ BASF

- Manufacturing
- Supply Chain
- Innovations

Smart

Digital Business Models

BASF New Business
- Scouting & incubation
- Business Build up
- E-Power Management, Fleece Solutions, Organic Electronics & 3D-Printing

BASF Venture Capital
- Corporate venture capital company
- Globally investing in start-ups
- Energy management, Nanotechnology, Biotechnology (green, white), innovations related to BASF’s existing portfolio

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