Sustainable Solution Steering® – Accelerator Example Collection

- for external use -

July 7, 2017, Annette Hoellebrand (COM/CP)
>60,000 solutions assessed

>13,500 Accelerator solutions
with ~ 14,000,000,000 € sales in 2016

>60% of R&D budget spent on Accelerator projects in 2016

≈ 900 actions defined

>2,000 experts involved e.g.
R&D
Product Safety
Sales
Marketing
Sustainability
Our purpose –
We create chemistry for a sustainable future

We contribute to a world that provides a viable future with enhanced quality of life for everyone. We do so by creating chemistry for our customers and society and by making the best use of available resources. We live our corporate purpose by: sourcing and producing responsibly, acting as a fair and reliable partner and connecting creative minds to find the best solutions for market needs. For us, this is what successful business is all about.
We translate megatrends into products to contribute to sustainability needs

Megatrends

Population increase

Middle class growth

Aging

Urbanization

Industry / Market Needs

Cost savings downstream

Biodiversity

Climate change

Renewables

Energy

Emission reduction

Resource efficiency

Water

Health and safety

UN Sustainable Development Goals
We actively address changing regulations and societal expectations.

Identifying risks and capturing business opportunities with customers.

Today’s focus:

- Responsible Production

Resources → Production → Products/Processes → Solution

Needs:

- Consumers
- Industries
- Chemicals
- Suppliers
- Raw Material

July 7, 2017
That’s why we initiated the systematic Sustainable Solution Steering® approach.

It’s a three step process

Step 1
Analysis of **sustainability needs** and trends in the value chains

Step 2
**Evaluation and categorization** of product sustainability performance in the market application

Step 3
**Development of action plans** for strategies, R&D, and market approach
Currently 27.2% of our solutions are Accelerators

- Substantial sustainability contribution in the value chain
- Meets basic sustainability standards on the market
- Specific sustainability issue which are being actively addressed
- Significant sustainability concern identified and action plan in development

We will increase the Accelerators and develop action plans for Challenged solutions

July 7, 2017
Our Accelerators contribute to specific sustainability needs of our customers

- Cost savings downstream
- Biodiversity and renewables
- Climate change and energy
- Emission reduction
- Resource efficiency
- Water
- Health and safety
- UN Sustainable Development Goals
  - Hunger and poverty

*In our assessment, we focus on “hunger and poverty” – as many of the other UN SDGs are covered by our other sustainability criteria.

(Double nomination possible)
By 2020, we will increase the sales share of Accelerators to 28%.

Accelerators ...  
... outgrow their markets  
... meet the sustainability needs of our customers  
... are driven by our power to innovate

Sustainable Solution Steering®
In summary, our stakeholders benefit from Sustainable Solution Steering®

Customers
- Profit from innovative solutions
- Receive support regarding sustainability needs

Society
- Benefits from reduced environmental impacts
- Benefits from improved quality of life

Shareholders
- Capitalize on opportunities
- Mitigate risks
Sustainable Solution Steering®
Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources
Accelerator Acrodur®

Process information

**Application:** Binding agent for natural, synthetic and glass fibers

**Customer Industry:** Automotive Industry, Furniture

**Market:** Global

Sustainability performance

- Water-based
- Low-emission
- No organic substances are released during cross-linking
- Safe working atmosphere

Differentiation potential

- Light weight solutions
- Thermo-mechanical stability: up to 220 °C
- High share of renewables: up to 75 % of natural fibers
- Flexibility in design

Acrodur® enables the production of lightweight and sustainable composites.
Accelerator CathoGuard® 800

Process information

**Application:** Cathodic electrocoats for corrosion protection

**Customer industry:** Transportation

**Market:** Global

Sustainability performance

- Clear competitive advantage since launch in 2010 due to high surface quality, optimal edge protection and excellent throwing power

- New CathoGuard® e-coats are optimally suited for integrated coating processes that dispense with application of the primer coat. They contribute to the durability of millions of cars, while offering an alternative to tin-containing formulations

- They enable an e-coat application process with efficient material consumption, optimizing the use of resources

An innovative solution for the highest eco-efficiency

Differentiation potential

**Customer:**

- Cost savings downstream

- Resource efficiency

- Air pollution

- Climate change & energy

- Health & safety
Accelerator
Integrated Process II

Process information

- **Application:** Automotive Coatings
- **Customer industry:** Automotive
- **Market:** Global

Sustainability performance

- With the Integrated Process II (IP II), the functionality of the primer is integrated in the basecoat layer – with no compromise to the high quality of the finish.
- A new waterborne basecoat system takes on the functions of the primer.
- This has led to a shortened coating process and an industry trend, which is used by OEMs worldwide in new and existing plants.

Differentiation potential

- **Customer:**
  - Cost savings (in personnel and energy costs)
  - Climate change & energy
  - Pollution (i.e. reduction of CO2 emission and VOC)
  - Resource efficiency

Enabling our customers to reduce energy and material consumption as well as total process costs.
Accelerator
Glasurit® 151-170 UV Primer Filler grey

Process information
Application: Rapidly drying primer filler ideally suited for cosmetic and moderate repairs
Customer industry: Automotive Refinish Coatings
Market: EMEA

Sustainability performance
- Repairs of minor to moderate damages to car parts are now among bodyshops’ most common repair jobs. For them, it is important to work profitably in this segment.
- UV-A technology ensures quicker drying than any other heat source commonly used in bodyshops. It therefore enables bodyshops to save energy costs and drying time.
- Saves further process times because it eliminates the cooling phase.
- UV-A radiation is the least harmful part of ultraviolet light. This makes the technology safe and easy to use.

Boost efficiency at the speed of light.

Differentiation potential
Customer:
- Cost savings downstream
- Resource efficiency
- Climate change & energy
- Health & safety
Accelerator
R-M® RAPIDCLEAR C 2570

Process information

Application: Quick-drying clearcoat with no loss of quality
Customer industry: Automotive Refinish Coatings
Market: EMEA, South America, Asia Pacific

Sustainability performance

- This clearcoat needs no flash-off time and provides an excellent finish after only a short drying time in the oven at 60 °C panel temperature. It also boasts outstanding drying properties at 40 °C and at room temperature.
- Reflow technology: small scratches will heal under the influence of heat or sunlight
- Wide range of possible applications: excellent polishing characteristics; can be applied to both vertical and horizontal panels; perfect paint result regardless of whether HVLP or RP sprayguns are used

Differentiation potential

Customer:
- Cost savings downstream
- Resource efficiency
- Climate change & energy
- Health & safety
- Climate change & energy

Fast-drying and simple to use for a wide range of applications.
Accelerator Formic Acid

Process information

Application: Runaway and Road De-icing
Customer industry: Transportation
Market: Global

Sustainability performance
- Better biodegradability than urea and acetate, therefore reduced chemical oxygen demand
- Reduced water treatment demand, and costs

Differentiation potential
- Cost savings downstream
- Water scarcity and pollution

Enabling ecoefficient de-icing
**Accelerator Neopentyl Glycol**

### Process information

**Application:** Powder Coatings Resins  
**Customer industry:** Automotive, Construction  
**Market:** Global

### Sustainability performance

- Neopentyl Glycol is used in powder coating resins, a low VOC alternative to conventional resins.
- Additionally, BASF offers a Neopentyl Glycol with enhanced environmental performance, by using the mass balance approach, which consists in replacing a certain amount of fossil raw materials with renewable feedstock.
- The method is subject to third party certification (TÜV Süd).

### Differentiation potential

- Biodiversity & Renewables

Contributing to use renewable feedstocks with the mass balance approach.
**Process information**

<table>
<thead>
<tr>
<th>Application</th>
<th>Ozone removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer industry</td>
<td>Aviation</td>
</tr>
<tr>
<td>Market</td>
<td>Global</td>
</tr>
</tbody>
</table>

**Sustainability performance**

- Addresses aircraft cabin air purification
- Health/safety/comfort of passengers and crew improved by mitigating exposure to ozone in aircraft cabin air
- Since 1980, BASF has been the leading supplier of ozone removal systems for Boeing, Airbus, Gulfstream, Dassault, and many other aircraft

**Differentiation potential**

- Emissions Reduction
- Health & Safety

BASF’s innovative "Deoxo Catalysts" are specifically designed to maintain a healthy cabin environment in airplanes
Accelerator
Recycling of PGMs
(Platinum Group Metals)

Process information

Application: Spent catalyst recycling, precious metals recovery
Customer industry: Catalysts
Market: Europe and North America

Sustainability performance

- Extracting PGMs through the process of Smelting & Refining spent automotive and chemical catalysts; results in energy and resource savings
- Provides a sustainable and economically viable secondary source of the world’s limited natural resources
- Recycling of end-of-life catalysts for use in new generation catalysts that provide clean air and increased energy efficiency and production yields

Differentiation potential

- Resource efficiency
- Cost savings downstream
- Emissions reduction (as applied to new generation autocatalysts)

Recycling and recovery of precious metals for cost effective, sustainable use in a new generation of chemical and autocatalysts
Accelerator
PremAir® Direct Ozone Reduction Catalyst

Process information

Application: Emissions control catalyst
Customer industry: Automotive
Market: North America and Korea

Sustainability performance

- PremAir enables automakers to generate exhaust emission credits that derive value in terms of cost reduction of the entire emission control system
- Both the Air Resources Board of California and U.S. EPA have approved PremAir as a proven ozone reduction catalyst for use in current and future emission control strategies
- PremAir is a base metal catalyst which provides a sustainable and stable raw material supply chain

Differentiation potential

- Emissions reduction
- Cost savings downstream

A patented catalyst coating that transforms ground level ozone, the main component of smog, into oxygen by simply driving down the road
Accelerator
FWC™ Catalyst (Four-way Conversion Catalyst)

Process information

Application: Emissions control catalyst
Customer industry: Automotive
Market: Europe and North America

Sustainability performance

- Euro 6 regulations will enforce, in addition to HC (Hydrocarbons), CO (Carbon Monoxide), and NOx (Nitrogen Oxides), tighter control of PM (Particulate Matter) emissions from gasoline-engine powered vehicles
- FWC™ catalyst combines the functionality of a Three-Way Catalyst (TWC) with a filter to remove all four pollutants with just one component
- Also lowers backpressure, saves space, ensures particulate emission below tight regulation limits

Differentiation potential

- Emissions reduction
- Cost savings downstream
- Resource efficiency

Innovative single-component four-way conversion catalyst that removes multiple pollutants from gasoline engine exhaust
Accelerator
Three-Way-Catalysts (TWC)

Process information

Application: Emissions control catalyst
Customer industry: Automotive
Market: Global

Sustainability performance

- Arguably the most important pollution abatement device ever invented, the catalytic converter today is a key component of most new cars around the world.
- Since its inception, our TWC technology has destroyed over 1 billion tons of Hydrocarbons (HC), Carbon Monoxide (CO), and Nitrogen Oxide (NOx) before it reaches the atmosphere.

Leading-edge emissions abatement technology that helps auto manufacturers meet increasingly stringent environmental regulations around the world.

Diffentiation potential

- Emissions reduction
- Cost savings downstream
- Resource efficiency
Accelerator
Aliphatic High Performance Material TPU

Process information

Application: Over-molded soft touch parts
Customer industry: Automotive interiors
Market: Europe

Sustainability performance
- Significantly shorter production cycles
- No solvents involved in the production
- Higher durability
- No additional coating required
- Lower cost and production complexity

Differentiation potential
- No competitive thermoplastic material available on the market
- Product patent protected
- First best alternative solution is solvent based coating

Soft touch solution that lasts! UV stable and highly durable TPU successfully replaces less environment friendly and less performing soft touch paints
Accelerator
Elastoflex® E3532

Process information

Application: Semi-structural parts for transportation (e.g. trunkfloor)
Customer industry: Transportation Industry
Market: Global

Sustainability performance

- Increased climate protection potential and energy savings
- Increased health and safety behavior
- Cost savings downstream

Differentiation potential

- Weight reduction
- Lower processing temperature and lower worker exposure
- Shorter shifts

Elastoflex® E3532 is the newest product generation for structural parts for transportation
Accelerator
Ultraform® N2320 C SW110

Process information

Application: Fuel filter housing
Customer industry: Transportation
Market: Customer demand compliance with the high requirements of SAE standard J1645, which can only be met by a conductive material

Sustainability performance

- SAFETY: Elimination of electrostatic charging and sparking as fuel flows through the filter
- Replacement of thermoplastics with lower performance
- Metal replacement

Differentiation potential

- Under measuring conditions according to ISO 3915, the conductive Ultraform attains a value of a mere 30 ohm/cm, so that it meets the requirements of SAE J1645 with ease. This eliminates the risk of electrostatic charging and sparking as fuel flows through the filter

The housing of fuel filters (colored in black) meets the stringent requirements of car producers in terms of electric conductivity, burst-pressure resistance and creep resistance
## Accelerator AdBlue® The clean solution

### Process information

<table>
<thead>
<tr>
<th>Application:</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer industry:</td>
<td>Automotive, Fuel, Logistic</td>
</tr>
<tr>
<td>Market:</td>
<td>Global</td>
</tr>
</tbody>
</table>

### Sustainability performance

- Reduces NOx emissions
- Saves up to 8% fuel

### Differentiation potential

- **Consumer**
  - Pollution (air, soil, noise)
  - Resource Efficiency
  - Cost Savings

**Reduced fuel consumption and constant engine output**
Accelerator CIP

Process information

Application: Inductors for computers and electronics
Customer industry: Electronics
Market: ICT, Automotive, etc.

Sustainability performance

- As core material in inductors CIP saves energy due to lowest losses compared to other materials
- Unique solution for computer and electronics inductors being resistant to corrosion
- Eliminates wet chemical coating process, less emissions at customer production sites

Unique market position

Differentiation potential

- Customer
  - Climate Change & Energy
  - Resource Efficiency
  - Cost Savings Downstream
  - Pollution (air, soil, noise)
## Process information

<table>
<thead>
<tr>
<th>Application:</th>
<th>Small metal parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer industry:</td>
<td>Various</td>
</tr>
<tr>
<td>Market:</td>
<td>Eng. Parts, Automotive,…</td>
</tr>
</tbody>
</table>

## Sustainability performance

- Trade Name Catamold™
- Saves energy and material downstream compared to investment casting for small metal parts
- Trainings as a service for customers

## Differentiation potential

- Customer
  - Resource Efficiency
  - Cost Savings Downstream
**Accelerator**
**Potassium Methylate**

**Process information**

- **Application:** Biodiesel
- **Customer industry:** Automotive
- **Market:** Automotive

**Sustainability performance**

- K-Methylate enables the production of biodiesel from waste materials such as used cooking oil or animal fat. Biodiesel of such origins substitutes and saves up to 85% of GHG emissions compared to conventional Diesel

**Differentiation potential**

- **Consumer**
  - Climate Change & Energy
  - Resource Efficiency
  - Pollution (air, soil, noise)

Potassium Methylate enables Biodiesel from waste materials
Sustainable Solution Steering®
Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources
Accelerator
Green Sense® Concrete Technology

Process information

Application: Performance package for more economical and environmental friendly concrete
Customer industry: Construction industry
Concrete producers
Market: Concrete admixtures

Sustainability performance

- Formulations of concrete mixtures that contain a high proportion of recycled materials
- Decrease of carbon footprint and environmental impact of buildings
- Extended lifecycles of buildings

Differentiation potential

- MasterGlenium® product and expertise of concrete mix optimization service lead to an environmentally preferred building material, proven by e.g. LEED and DGNB certification
- Eco-efficiency analysis from BASF proves the economic and ecological benefits of Green Sense Concrete over the entire lifecycle of a building in comparison with conventional products and processes

Unique performance package that optimizes concrete mixtures with regard to environmental friendliness, performance and production costs
Process information

Application: Advanced concrete hardening accelerator
Customer industry: Construction industry
Concrete producers
Market: Concrete admixtures

Sustainability performance

- Shortened process cycles, more flexible capacity utilization and increased efficiency help to save time and reduce cost
- Allows the use of more supplementary cementitious materials with reduced CO2 emissions during the production phase
- Energy savings and reduction of CO2 by eliminating the need of heat curing

Differentiation potential

- Innovative and patent protected technology by BASF significantly accelerates concrete hardening at early stages of curing
- Quality improvement of the hardened cement paste, providing durability, aesthetics and eco-efficiency benefits
- Technology does not interfere adversely with the final hardness and service life of the concrete
- Reliable concrete pouring in winter at low outside temperatures

Novel hardening accelerator facilitating efficient concrete applications even at low temperatures without need of heat curing - saving energy, time and costs
# Accelerator

**MasterGlenium®**

## Process information

**Application:** High performance concrete

**Customer segment:** Concrete producers

**Product line:** Concrete admixtures

## Sustainability performance

- Enables reduction of cement content in concrete
- Enables a decrease of carbon footprint and environmental impact of buildings
- High performance concrete improves durability of constructions

## Differentiation potential

- MasterGlenium products can be tailored to the specific needs of a project or a customer production site
- Control of workability retention of concrete to ensure perfect performance of concrete upon delivery on site.

Modern Superplasticizer for total performance control of concrete
Accelerator
Smart Dynamic™ Concrete

Process information

**Application:** Highly workable concrete for speedy and ergonomic concrete placing

**Customer segment:** Concrete producers, Ready-mix and Projects

Sustainability performance

**Product line:** Concrete admixtures

- Design of concrete mixtures to enable high fluidity of concrete for fast pumping and placing
- Improved ergonomy and safety on site
- Reduced noise levels
- Extended life-cycle of buildings
- Avoids heavy increase of cementitious materials usually required to achieve performance profile

Performance package to enable concrete construction to be faster, safer and more ergonomic.

Differentiation potential

- MasterMatrix product and expertise of concrete mix optimization service lead to an cost effective self consolidating concrete.
- Fully compatible with MasterGlenium and MasterSure premium plasticizers.
Accelera
tor
MasterMatrix SDC

Process information

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Customer segment: Concrete producers, Ready-mix and Projects

Sustainability performance

Product line: Concrete admixtures
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Process information

**Application:** Wind Turbine Grout

**Customer industry:** Construction industry

**Market:** On- and off-shore wind turbine installation

**Sustainability performance**
- Safe and durable installations
- Fast and cost saving installation
- High Energy yield due to low downtimes

**Differentiation potential**
- High fatigue resistance ensures durability also in very harsh off-shore conditions (cyclic & bending loads)
- Excellent pumpability over long distances
- Excellent Freeze-thaw resistance
- Volume stable – zero autogenous shrinkage

Fatigue resistant, cementitious grouts for Wind Turbines
Accelerator Plus
MasterSeal NP 100/ NP 150

Process information

Application: Joint Sealants

Customer industry: Construction industry

Market: Residential and Non-residential Buildings

Sustainability performance

- Isocyante free curing to improve job site EHS
- Low Volatile Organic Compound (VOC) content, suitable for interior use (LEED certified)

Differentiation potential

- MasterSeal NP100 and NP 150 easy to use (1 component) hybrid sealants with high movement capabilities
- Low modulus sealants that ensure a high durability of the joints even at high movements
- Fast curing and early overpaintability ensure quick installation
- Adhesion to a wide range of building materials

Isocyante-free curing Hybrid Sealant
Process information

Application: Waterproofing
Customer industry: Construction industry
Market: Water management, Infrastructure,

Sustainability performance
- Light-weight mortar for increased job site EHS
- Increased yield (m² / kg) reduces emissions for transportation
- High performance waterproofing improves durability of constructions

Differentiation potential
- MasterSeal FX 6100 is an easy to use (1 component) cementitous waterproofing membrane with 85% increased yield (area per weight).
- MasterSeal 560 is a high performance (elasticity @ -20°C) cementitous waterproofing membrane with 40% increased yield.
- Due to their improved binder system, both products are rapidly curing and enable fast return to service.

Highly efficient cementitous Waterproofing Membrane
Accelerator
Neopentyl Glycol

Process information

Application: Powder Coatings Resins
Customer industry: Automotive, Construction
Market: Global

Sustainability performance

- Neopentyl Glycol is used in powder coating resins, a low VOC alternative to conventional resins
- Additionally, BASF offers a Neopentyl Glycol with enhanced environmental performance, by using the mass balance approach, which consists in replacing a certain amount of fossil raw materials with renewable feedstock
- The method is subject to third party certification (TÜV Süd)

Differentiation potential

- Biodiversity & Renewables

Contributing to use renewable feedstocks with the mass balance approach
Process information

Application: PIR system for sandwich elements and insulating panels
Customer industry: Construction/Building
Market: Continuous sandwich panels

Sustainability performance

- Increased resource efficiency and decreased energy consumption
- Increased health and safety behavior

Differentiation potential

- Increased thermal conductivity values/figures of 0.019 W/mK
- Increased fire resistance; in case of fire reduced smoke density and reduced toxicity of smoke
- No brominated flame retardants used, in total reduces amounts of flame retardants

Elastopir® is the latest product generation for sandwich elements and insulating panels
**Process information**

**Application:** Insulation

**Customer industry:** Construction (New Buildings and Renovation)

**Market:** Europe, North America, South Korea, China

**Sustainability performance**

- **Neopor** provides high insulation performance with small amount of material, providing improved resource efficiency, compared to white EPS
- **Neopor** contributes to cost savings downstream
- Insulation with **Neopor** positively contributes to climate protection and energy efficiency

**Differentiation potential**

- **Neopor** has improved insulation performance compared to the standard white EPS
- **Neopor** provides high insulation with less material consumption (up to 50%), which allows material cost savings at the end customer
- **Neopor** enables the end customer to save more energy with a high performance insulation

**Neopor® insulating materials offer improved insulating performance and lower use of materials than conventional EPS**

Note: **Neopor** is produced with a new polimeric flame retardant, substituting former HBCD (substance facing EU-regulatory ban process)
Accelerator
Styrodur®

Process information

Application: Perimeter and inverted roof insulation
Customer industry: Construction (Renovation)
Market: Europe

Sustainability performance

- Insulation with Styrodur reduces CO2 emissions
- Styrodur applied in the perimeter insulation improves energy efficiency of buildings

Differentiation potential

- Styrodur is a cost efficient solution for perimeter and inverted roof insulation of houses
- Styrodur enables the end customer to save energy

Styrodur® allows reduction of CO₂ emissions and energy savings due to excellent insulating performance

Note: Styrodur is produced with a new polimeric flame retardant, substituting former HBCD (substance facing EU-regulatory ban process)
Accelerator
ProEco® HE 801-46

Process information

Application: Compounded Industrial Lubes-Hydraulic Fluids
Customer industry: Construction/Forestry/
Agriculture/ Marine
Market: Global

Sustainability performance

- > 90 % bio based content
- Classified as “Readily Biodegradable”
- Recognized by Eco-labelling programs around the world, including EU Ecolabel, Japan Eco Mark, and US BioPreferred
- Longer drain intervals – less oil disposal

Differentiation potential

- Exceptional wear and corrosion protection
- Exceeds Caterpillar BF-2 specification
- Cost savings due to less maintenance (longer drain intervals)
- Environmentally friendly and at the same time top-performing lubricant

Next-generation, high-performance bio-hydraulic fluid for severe applications
Accelerator Lutropur® MSA, Lutropur® MSA 100

Process information

**Application:** Various, e.g. Metal Surface Treatment, Cleaning, Chemical Processing, Biofuels, Mining, Drilling

**Customer industry:** Chemicals industry

**Market:** Europe, N. America, Asia/Pacific

Sustainability performance

- Strong and odorless organic acid with superior efficiency
- Part of the natural sulfur cycle, readily biodegradable
- Unique, more efficient and safer production process than competition (e.g. no co-product, air oxidation instead of chlorine oxidation)
- Replacement of acids with low environmental and health profile (HCl, HF, PSA, HBF4, HNO3, etc.)
- Highly efficient catalyst with low side product formation
- Enabler for second generation biofuel technologies (biofuel from waste streams)

Differentiation potential

- **Customer**
  - Cost savings downstream
  - Biodegradability
  - Pollution (air, soil, noise)
  - Resource efficiency
  - Water scarcity and pollution
  - Health and safety

Strong organic acid with high efficiency and low environmental impact
Accelerator
Lugalvan® Passivation

Process information

Application: Corrosion protection
Customer industry: Steel industry
Market: Europe

Sustainability performance

- Alternative to fluoride and heavy metal containing products, conversion coating that can replace chrome-3 based products for zinc-plated (galvanized) steel coil
- No handling of heavy metals containing products

Differentiation potential

- Customer
  - Pollution (air, soil)
  - Health and safety

Environmentally friendly conversion coating for galvanized steel
# Accelerator Korantin® PP

**Process information**

**Application:**
Industrial cleaning, Metalworking, Acidizing treatments

**Customer industry:**
Formulators for metal surface treatment

**Market:**
Europe

**Sustainability performance**
- Corrosion inhibitor for steel with very good performance in acidic media
- Product can be used in lower quantities than regular corrosion inhibitors
- Substitute for toxic products (e.g. Butyne diol)
- Product with improved labeling

**Differentiation potential**
- **Customer**
  - Resource efficiency
  - Health and safety

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High performance corrosion inhibitor with good resource efficiency
Sustainable Solution Steering®
Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources
Accelerator
Renewable PolyTHF®

Process information

Application: Spandex, TPU, elastomers
Customer industry: Textile, plastics
Market: Global

Sustainability performance

- Value Chain based on the direct fermentation of renewable resources by high-performing microorganisms
- The production process of renewable PolyTHF® precursor relies on a patented technology from Genomatica (GENO BDO™)
- Ecologically attractive alternative to petrochemical raw materials

Differentiation potential

- Biodiversity & Renewables
- Climate Change and Energy

Contributing to use renewable feedstocks
Accelerator
Cetiol® Ultimate

Process information

Application: Ultra-fast spreading emollient for Face / Body / Sun Care and Color Cosmetics

Customer industry: Personal Care

Market: Global

Sustainability performance

- 100% natural-based and volatile emollient
- Replacement of volatile silicones possible
- Easier to use than volatile hydrocarbons
- Readily biodegradable
- Gives more flexibility in the development of natural cosmetics concepts for improved skin feel

Differentiation potential

- Customer
  - Plant based chemistry for possible cyclomethicone substitution
  - New formulation textures and claims possible
- Consumer
  - New natural cosmetic concepts

Regarded as breakthrough innovation and won 3rd prize of Innovation Awards at SEPAWA 2014
Accelerator
Gluadin® WLM Benz

Process information

Application: Microprotein for deep penetration, protection, repair in hair care products
Customer industry: Personal Care
Market: Global

Sustainability performance

- 100% vegetable-based
- Enzymatically hydrolyzed
- Improved color and odor compared to chemical hydrolysis
- 50% energy savings compared to chem. hydrolysis
- Due to benzoic acid preservation and non-GMO enzymes, suitable for all natural and organic cosmetic standards

Differentiation potential

- Customer
  - Climate change & energy
  - Renewables
- Consumer
  - Health
  - Improved hair condition

Microprotein with improved performance and significant sustainability impact
Accelerator
Lipofructyl® Argan LS 9779

Process information

Application: Moisturization
Customer industry: Personal Care
Market: Global

Sustainability performance

- Organic and fair trade certified argan oil,
- Sourced in partnership with an agricultural women’s cooperative in Morocco
- Enabling socio-economic development
- Selected for L’Oreal’s Solidarity Sourcing program and the UNGC yearbook case study

Differentiation potential

- Customer
  - UN Millennium Development Goals
  - Biodiversity & renewables
- Consumer
  - Contribution to sustainability

Responsible sourcing of argan based materials
**Process information**

**Application:** Nonionic surfactant for rinse-off applications  
**Customer industry:** Personal Care  
**Market:** Mainly Europe

**Sustainability performance**

- First alkyl polyglucoside (APG) based on certified sustainable palm kernel oil (CSPKO) – segregated  
- Full APG line based on certified sustainable palm kernel oil (CSPKO) – mass balance  
- Special mild nonionic surfactant for natural-based, rinse-off formulation concepts  
- 100% renewable based  
- Without ethylene oxide (EO) technology

**Differentiation potential**

- **Customer**  
  - New claim (RSPO) possible  
  - Contributes to stakeholder targets  
  - Biodiversity & renewables  
- **Consumer**  
  - Contribution to sustainable sourcing of ingredients

Enables customers to meet market demands for finished products based on certified sustainable palm kernel oil (CSPKO)
Accelerator
Texapon® N 70/SG
Texapon® N 70/MB

Process information
Application: Anionic surfactant for rinse-off applications
Customer industry: Home and Personal Care
Market: Mainly Europe

Sustainability performance
- First sodium lauryl ether sulfate based on certified sustainable palm kernel oil (CSPKO) – segregated or mass balance

Differentiation potential
- Customer
  - New claim (RSPO) possible
  - Supports our customers own path to sustainable development
- Consumer
  - Contribution to sustainable sourcing of ingredients

Enables customers to meet market demands for finished products based on certified sustainable palm kernel oil (CSPKO)
Accelerator
Dehyton® PK 45/SG
Dehyton® PK 45/MB

Process information

Application: Amphoteric surfactant for rinse-off applications
Customer industry: Home and Personal Care
Market: Mainly Europe

Sustainability performance

- First coco amidopropyl betaine based on certified sustainable palm kernel oil (CSPKO) – segregated or mass balance

Differentiation potential

- Customer
  - New claim (RSPO) possible
  - Supports our customers own path to sustainable development
- Consumer
  - Contribution to sustainable sourcing of ingredients

Enables customers to meet market demands for finished products based on certified sustainable palm kernel oil (CSPKO)
Accelerator
HySorb® permeable products

Process information

**Application:** Superabsorbent polymers for disposable diapers, feminine hygiene and incontinence products

**Customer industry:** Hygiene Industry

**Market:** Global

Sustainability performance

- Highly effective for liquid distribution and absorption, thus replacing bulkier traditional materials such as fluff pulp in diapers
- Keep babies skin dry, provides comfort, improving quality of life for families
- Using less material for thinner diapers saves energy and resources, and reduces the volume of waste heading to landfill or incinerators

Differentiation potential

- **Customer**
  - Light weight diapers have an improved eco-efficiency
  - Major flexibility for diaper core design
- **Consumer**
  - Modern diapers offer benefits in terms of dryness, comfort, weight and waste reduction

High performance superabsorbent replacing fluff pulp in diapers
Process information

Application: Superabsorbent polymers for disposable diapers, feminine hygiene and incontinence products

Customer industry: Hygiene Industry

Market: Global

Sustainability performance

- High performance superabsorbent
- Odor solution ensuring dignity and comfort of people with incontinence
- Enabling active seniors to participate in social life and though contributing to social responsibility
- Reduction of carbon footprint & waste possible due to fewer diaper changes

Differentiation potential

- Customer
  - Differentiation through claims

- Consumer’s quality of life
  - Keeps skin dry
  - Discreetness
  - Comfort

High performance superabsorbent with odor control functionality
Accelerator HySorb® Biomass Balanced

Process information

**Application:** Superabsorbent polymers for disposable diapers, feminine hygiene and incontinence products

**Customer industry:** Hygiene Industry

**Market:** Global

Sustainability performance

- BASF’s biomass balance approach drives the replacement of fossil with renewable resources in the value chain of this or other BASF products
- Renewable feedstock with sustainability certificate is used at the beginning of the production chain and then allocated to this biomass balanced product*, based on third-party standard by TÜV Süd
- LCA results (3rd party reviewed BASF assessment): saves fossil resources and reduces carbon footprint compared to non biomass balanced HySorb®
- High performance superabsorbent: drop-in solution

Differentiation potential

- Renewable feedstock
- Climate change
- Additional resource efficiency through preferred use of waste vegetable oil & fat, organic waste biogas
- Added value proposition, for consideration by customers in developing their claims
- Can contribute to requirements of Nordic Ecolabel for sanitary products

*Note: The product is not ASTM D6866 certified

High performance superabsorbent driving the use of biomass
Accelerator SAVIVA®

Process information

Application: Superabsorbent polymers for disposable diapers, feminine hygiene and incontinence products

Customer industry: Hygiene Industry

Market: Global

Sustainability performance

- Thinner diapers and improved haptic
- Through high capacity and efficiency significant raw material savings (SAP and Fluff reduction)
- Increased dosing accuracy for waste reduction
- Benefits in terms of logistic like transportation and storage
- Reduction of diaper’s carbon footprint

Differentiation potential

- Customer
  - Innovation of diaper design and efficiency
  - Excellent processability
  - Logistic benefits
- Consumer
  - Thinner diapers with increased comfort and haptic

New generation of high efficient superabsorbent polymers
Accelerator
Trilon® M Max types

Process information

Application: Home Care and I&I
Focus Dishwashing
Customer industry: Consumer Goods
Market: Global

Sustainability performance

- Readily biodegradable strong chelating agent
- Meets eco-label requirements
- Good eco-tox profile compared to other strong chelating agents
- Eco-efficiency analysis available
- Phosphate alternative in automatic dish wash (ADW)

Differentiation potential

- Customer
  - Phosphate alternative
  - Performance in modern formulations
- Consumer
  - Health & safety
  - Sustainability and performance

The strong alternative to phosphates in modern dish wash formulations
Accelerator Lutropur® M

Process information

Application: Home Care and I&I
Focus Hard Surface Cleaning

Customer industry: Consumer Goods and I&I

Market: Global

Sustainability performance

- Strong acid
- Excellent cleaning properties
- Readily biodegradable
- Low corrosive
- Eco-efficiency analysis available
- Modern air oxidation production process
- Safe use

A strong acid offering a modern property profile

Differentiation potential

- Customer
  - Sustainability and performance
  - Health and safety
- Consumer
  - Health & safety
  - Material protection
Accelerator Glucopon® types

Process information

**Application:** Home Care and I&I

Focus Hard Surface Cleaning

**Customer industry:** Consumer Goods and I&I

**Market:** Global

Sustainability performance

- Gloss improvement, foam stabilization
- Cleaning performance
- 100% renewable based
- Meets eco-label requirements – aerobic and anaerobic biodegradable
- Registered in main chemical inventories

Differentiation potential

- **Customer**
  - Performance in modern formulations
  - Health and safety

- **Consumer**
  - Health & safety
  - Material protection

A balanced surfactant combining efficiency with an excellent eco-tox profile
**Process information**

**Application:** Home Care and I&I  
Focus Hard Surface Cleaners

**Customer industry:** Consumer Goods and I&I

**Market:** Global

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**Sustainability performance**

- Amphoteric modified starch
- Excellent eco-tox profile
- Aerobic and anaerobic biodegradable
- Supports sustainable convenience claims such as “easy-to-clean-again”, “time-saving”, “easy-to-use”

**Differentiation potential**

- **Customer**
  - Supported modern claims

- **Consumer**
  - Health & safety
  - Convenience
  - Performance

---

A product that supports modern consumer needs
**Process information**

- **Application:** wall paint
- **Customer industry:** Decorative Paints
- **Market:** South America

**Sustainability performance**

- Suvinil Acrylic Antibacterial eliminates 99 percent of the microorganisms on the surface of any wall and prevents them from returning for two years.
- The paint can be washed without compromising the effect, making it ideal for use in nurseries, hospitals and schools.
- It is available in a wide range of colors and allows for individual design.

**Differentiation potential**

- The effectiveness of the paint has been approved according to the parameters of JIS 2801:2000 (Japanese Industrial Standard) for antimicrobial products.
- Suvinil Acrylic Antibacterial is the first such product to get approval from Anvisa (Brazil's National Health Surveillance Agency), which certifies its safety and effectiveness.

**Protection from microorganisms:** Suvinil Acrylic Antibacterial allows a healthier environment at home.
Accelerator
Joncryl® FLX product line

Process information

Application: Flexible packaging inks,
Customer industry: Consumer goods
Market: Resins Printing & Packaging

Sustainability performance

- Conversion to water based technology, replacing solvent
- Enable lighter packaging

Differentiation potential

- Cost savings downstream
- Climate change and energy
- Pollution
- Resource efficiency
- Health and safety

This water based product also enables the creation of a lighter packaging
Accelerator
Biobased Succinic Acid

Process information
Application: Polyesters, Polyurethanes
Customer industry: Plastics
Market: Global

Sustainability performance
- Process based on renewable resources and high performing proprietary micro-organism, capturing CO₂
- Economically and ecologically attractive alternative to petrochemical raw materials

Differentiation potential
- Biodiversity & Renewables

Contributing to use renewable feedstocks
Process information

Application: Medical devices, toys, food packaging, flooring, wall covering

Customer industry: Medical, toys, food, building

Sustainability performance

- A unique performance comes along with an excellent toxicological profile and low migration rate
- Approved and certified by many competent authorities and institutions worldwide
- Established since 2002 for applications with close human contact

Differentiation potential

- Unique non-phthalate plasticizer
- Excellent toxicological profile
- Award winning plasticizer (e.g. ICIS Innovation Award 2006, BASF Innovation Award 2006, Solvin Award 2013)
- Trusted by leading brand owners and retailers

Hexamoll® DINCH® - the trusted non-phthalate plasticizer
### Elastocool® Advanced

**Process information**
- **Application:** PU system for insulation of fridges & freezers
- **Customer industry:** Household appliances
- **Market:** Global consumer refrigeration

### Differentiation potential
- **Lower thermal conductivity of ~0.5 mW/mK which enables the achievement of energy efficiency classes A++ and A+++**
- **Faster cycling time due to better demoulding behaviour which leads to higher output in the production**
- **Higher compressive strength values lead to lower material consumptions per unit (fridge, freezer)**

### Sustainability performance
- **Increased climate protection potential and energy savings**
- **Increased resource efficiency**
- **Cost savings downstream**

Elastocool® Advanced is the latest product generation of insulation material for fridges & freezers.
Accelerator ecovio® F2371(peepoo®)

Process information

**Application:** Peepoo bags  
**Customer industry:** Global  
**Market:** Consumer

Sustainability performance

- Biodegradability - enables composting of human wastes which helps enriching depleted soil  
- Valuable nutrients for farming as a substitute for fertilizers enable energy savings and resource efficiency  
- Helps achieving safety and health standards beyond industry level

Differentiation potential

- Cost Savings Downstream  
- UN Millennium Development Goals (#7)  
- Resource Efficiency  
- Water Scarcity & Pollution  
- Biodiversity & Renewables  
- Health and Safety

ecovio® for peepoo® supports sustainable social welfare by driving the purpose of offering access to sanitation via a public-private partnership business model
Accelerator
UF, mUF and MUF Particle Glue

Process information
Application: Particle board
Customer industry: Wood working industry
Market: Europe

Sustainability performance
- Selected glues like KL335, 337 and 465 enable the reduction of formaldehyde emissions, allows production of panels for higher FA standards (CARB2 and F*** panels)
- From 2013 on 50% of the UF glues are produced acc. to the new „HM“ process yielding competitive performance at the lowest raw material consumption in the industry

CML offers the most efficient particle glues for every emission class

Differentiation potential
- Customer
  - Pollution (air, soil, noise)
  - Resource Efficiency
Process information

Application: Particle board
Customer industry: Wood working industry
Market: Europe

Sustainability performance

- Cuts transports, transport costs
- Saves raw materials by reducing the panel density significantly
- Improves worker safety
- Cost savings downstream – no special hardware needed compared to competitive technologies

Differentiation potential

- Customer
  - Climate Change & Energy
  - Resource Efficiency
- Consumer
  - Health & Safety

The light weight solution
Sustainable Solution Steering®
Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources
Accelerator
Natugrain® TS

Process information
Application: Feed additive
Customer industry: Livestock production
Market: Animal Nutrition
Global: Nutrition & Health (EN)
SBU: Animal Nutrition

Sustainability performance
- Improved nutrient digestion with impact on litter quality (water resorption)
  Natugrain® TS feed enzyme contains highly purified NSP-degrading enzymes with the consequence of a better digestibility. This contributes to improved utilization of feed components in poultry and swine that enables animals to metabolize more energy
- Higher nutrient digestion of plant-derived feed components and higher weight gains
- Improved feed conversion rate with lower quality feed or by-products
  A higher nutrient digestion of plant-derived feed components can result in higher financial benefits

Benefits
- High efficacy
  The addition of Natugrain® TS to pig and poultry diets is a valuable and reliable solution for improving animal diets with the potential to reduce costs
- High product quality and stability
  BASF’s enzymes are high quality products produced using the best quality management standard possible

Improvement of feed conversion
Accelerator
Organic Acids: Luprosil®, Amasil®

Process information

Application: Feed additive
Customer industry: Livestock production
Market: Animal Nutrition
Global: Nutrition & Health (EN)
SBU: Animal Nutrition

Sustainability performance

- Prevention of spoilage by preserving feed and raw materials
  Luprosil® in silage prevents the formation of molds and thereof reduce feed losses during storage
- Improved feed and drinking water hygiene and reduces recontamination risk
  Amasil® reduces the pH-level in basic feed ingredients, compound feed and drinking water this creates a less favorable environment for microorganisms (e.g. salmonella or other gram negative bacteria)
- Reduced feed losses, smart buying possible, minimized health risk
  Stabilization of feed and raw material during storage enables users to buy higher quantities of feed more flexibly, e.g. when feed prices are low

Benefits

- Protect feed quality effectively
  BASF’s organic acids protect feedstuff against microorganisms and reduce feed losses and preserve the high value of mixed-feed. (worldwide rise in the price)
- Optimize production
  Improved feedstuff hygiene can relieve the burden on animals’ immune system, making it possible to achieve optimal production

Reduction of spoilage and improved feed hygiene
# Accelerator

**Vitamin A Food Fortification**

## Process information

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## Sustainability performance

- **Fight vitamin A deficiency in developing countries**
  - Prevention of blindness, weak immune and child mortality as well as ensuring maternal health

- **High stability during storage**
  - Due to anti-oxidants, vitamin A remains maximally effective when added to food and is robust even under extreme climatic conditions

## Benefits

- **Contribute to the UN millennium goals**
  - By enriching cheap staple foods like sugar, flour, oil and milk with vitamin A, BASF is responding to the malnutrition problem and improving public health and quality of life

- **Encourage effective application and realization**
  - The development of a “mini laboratory kit” allows food producers to easily check that they are adding the correct amount of Vitamin A to products

**Improvement of human living conditions with an economical solution**
Sustainable Solution Steering®
Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources
Accelerator Agnique® ME and Agnique® AMD

Process information

Application: Solvent
Customer industry: Agriculture
Market: Global

Sustainability performance

- Based on renewable resources
- Safe solvents
- Improved labeling
- Readily biodegradable
- Low VOC
- Alternative to conventional, hazardous solvents

Differentiation potential

- Customer
  - Health and safety
  - Resource efficiency

Non hazardous alternative to conventional solvents
Accelerator Agnique® PG 8105-G and Agnique® PG 8107-G

Process information

Application: Adjuvant
Customer industry: Agriculture
Market: Global

Sustainability performance

- Readily biodegradable
- Low Ecotoxicity
- Can replace TAM EO in Glyphosate formulations
- Fully based on renewable resources

Differentiation potential

- Customer
  - Reduces water scarcity and pollution
  - Environment, Health & safety

Alternative to tallow amine ethoxylates
Accelerator Agnique® TXI

Process information

Application: Adjuvant
Customer industry: Agriculture
Market: Global

Sustainability performance

- Reduces spray drift ➔ more efficient usage of formulation
- Readily biodegradable
- Reduced labelling

Differentiation potential

- Customer
  - Resource efficient solution
  - Water scarcity and pollution
  - Health, Environment & safety

More efficient usage of the final formulation
Accelerator Clearfield® Rice

Process information

Application: Clearfield Production System
Customer industry: Agriculture / Farming
Market: Malaysia Rice

Sustainability performance

- Combines the use of conventionally-bred herbicide tolerant seeds with purpose-designed herbicide, resulting in a better option for weed control and consequently, greater productivity as well as improvement in crop quality

Differentiation potential

- Only solution available in the market to control red rice, combining an effective mode of action with non GMO herbicide-tolerant seed
- Significantly higher yields (avg. increase of 2 – 4 MT/ha) with the Clearfield Production System
- Value for the customer: Up to 3 times greater rice yield
Accelerator
Priaxor® Fungicide

Process information

Application: Foliar Fungicide
Customer industry: Agriculture / Farming
Market: US Soybeans

Sustainability performance

- A dual mode of action is a powerful tool for integrated resistant management
- Priaxor’s consistent performance improves crop quality and yield

Differentiation potential

- Priaxor fungicide delivers advanced disease control along with the proven benefits of AgCelence® / Plant Health. These benefits include larger and greener leaves, stronger stems and improved tolerance to crop stress – all leading to increased yield potential of 2 bushels / acre (134 kg / hectare) on average.
Accelerator
Vault® HP System

Process information

Application: Seed Treatment
Customer industry: Agriculture
Market: Biological Seed Treatment
North America, South America,
进一步 global rollout planned

Sustainability performance

- Vault HP is a multi-component, yield-enhancing biological seed treatment system for soybeans and other dicots. The robust rhizobial inoculant improves root nodulation for more nitrogen-fixation potential, improved root architecture and nutrient uptake resulting in greater plant vigor, stress reduction, and optimized yield potential to support grower’s business and production sustainability.

Differentiation potential

- Increases yield enhancement and resource efficiency
- Extends suppression of diseases caused by Rhizoctonia and Fusarium spp.
- Offers the lowest application rate in the industry
- Extends the window of protection 30-45 days beyond the base protection of a seed applied fungicide
- More effective long-term N management for subsequent crops

Innovative technology based on naturally occurring biologials and biochemistry that enables our customers to optimize crop yield potential and resource efficiency
Accelerator Propionic Acid

Process information

Application: Feed Preservation
Customer industry: Agriculture
Market: Global

Sustainability performance
- Reducing energy consumption and Green House Gas emissions for the feed preservation
- Substitutes conventional heat drying

Differentiation potential
- Cost savings downstream
- Climate change & Energy
- Resource efficiency

Enabling environmentally friendly feed preservation
Accelerator ecovio® M2351 (mulch film)

Process information

Application: Mulch film
Customer industry: Agriculture
Market: Global

Sustainability performance

- Biodegradability
- Resource efficiency and water savings over time (higher yields by avoiding the white pollution)
- Avoiding emissions of toxic substances from open burning of PE mulch film
- Waste reduction, avoiding soil displacement

Differentiation potential

- Cost Savings Downstream
- Pollution (air, soil)
- Resource Efficiency
- Climate Change & Energy
- Biodiversity & Renewables

Over time, ecovio® biodegradable mulch film helps to avoid adverse consequences of the white pollution in agriculture such as crop yield decrease and water savings.
Accelerator
Genuity® DroughtGard® Hybrids

Product information

Application: Drought-tolerant biotech trait for Corn production
Customer industry: Agriculture
Market: USA (Western Great Plains area of Corn Belt)
Partner: Monsanto

Sustainability performance

- Supports sustainable corn production in regions where water limitations can impact yields
- Delivers more than 5 bushel/acre yield advantage over competitive drought products
- Provision of license-free biotech trait for the development of drought-tolerant varieties within the project ‘Water Efficient Maize for Africa’

Differentiation potential

- The first drought-tolerant biotechnology trait ever commercialized for corn
- Genuity® DroughtGard® Hybrids: a systems approach combining the drought tolerant trait, improved genetics, and farmer-level agronomic practices
- The results are higher yields and improved efficiency of resource utilization for the farmer

Enabling corn farmers to protect their yields by mitigating the effects of drought stress
Sustainable Solution Steering®
Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources
Process information

Application: Catalytic surface coatings for steam cracker furnace tubes

Customer industry: Energy & Resources

Market: Global

Sustainability performance

- Improves operational performance and profitability of steam cracking furnaces by:
  - Extending run length 2-10x between decokes
  - Lowering tube metal temperatures by avg. 50°C
  - Delivering 6-10% energy savings
  - Increasing coil life through reduced carburization
- Reduced carbon formation increases on-line production times through fewer decokes enabling more efficient energy usage and operations

Unique catalytic surface coatings that unlock maximum steam cracker throughput by minimizing formation of carbon from a range of petroleum feedstocks.

Differentiation potential

- Cost savings downstream
- Resource efficiency
- Climate & energy change
- Emission reduction
**Process information**

- **Application:** Gas Treatment
- **Customer industry:** Oil and Gas
- **Market:** Global

**Sustainability performance**

- OASE® purple removes carbon dioxide and hydrogen sulfide in natural-gas applications
- OASE® purple technology enables low capital expenditure (CAPEX) and reduced maintenance cost due to the use of stable, non-corrosive solvents and reduces process energy demand

**Differentiation potential**

- Emission reduction
- Cost savings downstream
- Climate change & Energy

Enabling innovative Gas Treatment
Accelerator
Baxxodur® EC 301

Process information

Application: Wind Blades
Customer industry: Renewable Energy
Market: Global

Sustainability performance

- Wind energy as important renewable energy source
- Epoxy systems essential for cost-competitive large wind blades manufacturing

Differentiation potential

- Climate change & Energy

Enabling wind energy for low carbon electricity production
Accelerator
No Flaring Directive*

Process information

Application: Oil Production
Customer industry: Energy & Resources
Market: Global

Sustainability performance

- Investments in innovative technologies to cease the flaring of associated gas arising from crude oil production in all routine operations
- Associated gas is used to generate electricity, heat and steam to operate the oil production facilities as well as to supply households with electricity.
- Enables to leverage economical and ecological advantages in operations

Differentiation potential

- Resource efficiency
- Pollution (air)
- Climate Change & Energy
- Cost savings

CO$_2$ prevention and efficient use of resources

*Wintershall set itself the goal of ceasing the flaring of associated gas arising from crude oil production in all routine operations.
Process information

**Application:** Additives for membrane process; antiscalant for reverse osmosis membranes

**Customer industry:** Energy & Resources

**Market:** Global

Sustainability performance

- Eco-friendly: No or low eutrophication in water bodies
- Resource efficiency: No usage or decreased usage of cleaning materials

Differentiation potential

- Enabling seawater and brackish water desalination as well as water recycling
- Outstanding scale-inhibiting performance
- Longer operation time of RO desalination plants without cleaning
- Increasing output

Eco-friendly antiscalant for resource efficient reverse osmosis desalination
Accelerator Rheomax® ETD

Process information

Application: Tailings Management
Customer industry: Mining Industry
Market: Tailing Treatment

Sustainability performance

- Rapid reclamation of process water, reduced fresh water requirement
- Drying time of tailings accelerated, resulting in a smaller land footprint
- Quicker rehabilitation time due to faster trafficable surface
- Dry surface leads to improved dust suppression

Differentiation potential

- Cost savings with Rheomax® ETD are versatile and primarily associated with improved water recovery and quicker rehabilitation time
- Reclamation of process water
- Faster rehabilitation of land

Link for further information about Rheomax® ETD:

Rheomax® ETD reduces the environmental footprint of mining operations
Accelerator Rheomax® DR

Process information

Application: Thickener Applications
Customer industry: Mining Industry
Market: Solid Liquid Separation

Sustainability performance

- Improved water recovery at the thickener
- Volume of waste water is reduced
- CCD washing efficiency is increased
- Energy can be saved due to reduced pumping pressure

Differentiation potential

- Savings in the cost of recovery of process water can be achieved
- Recovery of leached metal is improved

Link for further information about Rheomax® DR:

Rheomax® DR maximizes recovery of water and valuables
Accelerator
Sodium nitrate (in solar application)

Process information

Application: Heat storage medium
Customer industry: Energy and resources
Market: Concentrated Solar Power plants

Sustainability performance

- Increases efficiency of Concentrated Solar Power plants

Differentiation potential

- Customer
  - Cost Savings Downstream
  - Pollution (air, soil, noise)
- Consumer
  - Climate Change & Energy

Sodium nitrate increases competitiveness of solar power
150 Jahre

We create chemistry