

# Responsibility along the value chain

## Suppliers



Our objective is to secure competitive advantages for BASF through professional procurement structures. Our suppliers are an important element of our value chain. Together with them, we aim to create value and minimize risks.

### Strategy

With our sustainability-oriented supply chain management, we contribute to risk management by boosting our suppliers' awareness of our expectations and standards, and by supporting them in carrying out our specifications. We count on reliable supply relationships and want to make our suppliers' contribution to sustainable development transparent. In order to achieve this, we set ourselves an ambitious goal: By 2020, we aim to evaluate the sustainability performance of 70% of the BASF Group's relevant suppliers<sup>1</sup> pursuant to our risk-based approach and develop action plans for any necessary improvements. The proportion of evaluated relevant suppliers was at 31% by the end of 2015. Furthermore, our Procurement competence center supports BASF's business units in developing solutions to stand out from the competition in addressing market-specific requirements.

#### 2020 Goal

Percentage of relevant suppliers evaluated for their sustainability performance

70%

### Worldwide procurement

From our suppliers, we obtain raw materials, technical goods, and services – from technical to logistics and building facility services. BASF acquired raw materials, goods and services for our own production totaling approximately €35 billion in value from more than 75,000 suppliers around the world in 2015. Around 90% of this was locally sourced. With regard to our suppliers, there were no substantial changes in our value chain in 2015.

### What we expect from our suppliers

- Global Supplier Code of Conduct
- Country-specific risk analysis forms basis of new supplier selection

Both new and existing suppliers are selected and evaluated not only on the basis of economic criteria, but also on environmental, social and corporate governance standards. Our Supplier Code of Conduct is founded on internationally recognized guidelines, such as the principles of the United Nations' Global Compact, the International Labor Organization (ILO) conventions and the topic areas of the Responsible Care Initiative. Available in 26 languages, the Code of Conduct covers environmental protection as well as compliance with human rights, labor and social standards, and antidiscrimination and anticorruption policies.

A country-based risk analysis forms the basis of our selection process for new suppliers. As a result of the country-related risks identified in South America and Asia, we queried around 1,500 suppliers in 2015 on their commitment to the values of our Supplier Code of Conduct. Moreover, we provided training to a total of 525 suppliers with an elevated sustainability risk, especially in Asia and South America.

In addition, we instructed 363 procurement employees on sustainability-oriented supplier management. These are ways in which potential supply chain risks can be identified and minimized together with our suppliers.

<sup>1</sup> We define relevant suppliers as those showing an elevated sustainability risk potential as identified by risk matrices and with respect to corresponding country risks. Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio.

## Evaluating our suppliers

- **“Together for Sustainability” initiative aims to harmonize and standardize supplier assessments and audits**
- **135 raw material supplier sites audited**

BASF is a founding member of the Together for Sustainability (TfS) initiative of leading chemical companies for the global standardization of supplier evaluations and auditing. With the help of TfS, we advance sustainability in the supply chain. The initiative aims to develop and implement a global program for the responsible supply of goods and services and improve suppliers' environmental and social standards. The evaluation process is simplified for both suppliers and TfS member companies by a globally uniform questionnaire. The initiative's members conducted a total of 2,580 sustainability assessments and 179 audits in 2015. The number of members rose from twelve to 18. Together with the TfS initiative, we conducted a Supplier Day in São Paulo, Brazil, in 2015. TfS also held a joint conference in Shanghai, China, with the China Petroleum and Chemical Industry Federation (CPCIF) with the goal of enhancing mutual understanding of the challenges associated with sustainability.

In 2015, we held our first global Supplier Day in Ludwigshafen in order to set up new modes of collaboration together with selected suppliers.

Using TfS evaluations, we pursue a risk-oriented approach with clearly defined, BASF-specific follow-up processes. We drive these processes through a sustainability-oriented IT tool. Suppliers with an elevated sustainability risk are identified using risk matrices. Furthermore, our purchasers indicate the suppliers for whom they see a potentially elevated sustainability risk. We additionally check various information sources to see if any suppliers have been observed in connection with negative sustainability incidents. Based on these analyses, we conducted sustainability standard audits for a total of 135 raw material supplier sites and initiated 1,044 sustainability assessments through an external service provider in 2015.

In 2015, for example, we audited a supplier of mineral raw materials in South Africa and identified room for improvement primarily in the areas of environment and safety.

If we identify potential for improvement, we support suppliers in developing measures to fulfill our standards. We conduct another review according to a defined timeframe based on the sustainability risk measured. If the weak points discovered were particularly severe and we are unable to confirm any improvement, we reserve the right to terminate the business relationship.

This occurred in four cases in 2015. We use this approach to evaluate suppliers with an elevated sustainability risk at least every five years. The approach itself is reviewed every two years to identify possibilities for optimization.

## Supplier training

In 2015, we continued the collaborations begun in China and Brazil in 2014 to instruct suppliers on sustainability standards. We have developed a training program together with the East China University of Science and Technology in Shanghai, and plan to educate around 2,000 suppliers by 2019. We are pursuing the same approach in Brazil together with the Espaço ECO® Foundation. Through these cooperations, 485 suppliers already received training in 2015.

## Audit results

Our audits have revealed some deviations with respect to working hours and payment of the minimum wage, especially in China. Here, we have called for improvements on the part of our suppliers. None of our 2015 audits identified instances of child labor. For the suppliers we reviewed, persons under 18 were excluded from overtime, night shifts and dangerous work. We did not find any incidences of forced labor or other human rights violations in 2015.

 For more on sustainability in procurement, see [basf.com/suppliers](http://basf.com/suppliers)



## Raw materials



**Responsible resource management is an integral part of our strategy. It is applied within the company through our Verbund concept, our innovative products and the use of renewable raw materials. In the search for alternative raw materials, we employ solutions that contribute to sustainability. We as a company are dependent on ecosystem services and also have an impact on them. Examples include the availability of clean water and renewable resources, or even the effects of ecosystem services on the preservation of air, water and soil quality.**

### Strategy

The Verbund system is an important cornerstone of our resource efficiency strategy: The by-products of one plant often serve as feedstock elsewhere, thus helping us to use raw materials more efficiently. In 2015, BASF purchased a total of around 30,000 different raw materials from more than 6,000 suppliers. Some of our most important raw materials are naphtha, natural gas, methanol, ammonia and benzene. We apply the “mass balance approach” in our Verbund system for the use of renewable raw materials. Furthermore, we are involved in the responsible cultivation and utilization of renewables in numerous projects along the value chain.

### Renewable resources

- **Bio-based PolyTHF® 1000 offered for testing purposes for the first time**
- **New voluntary commitment and goals for procuring palm oil products**

In 2015, around 5.8% of the raw materials we purchased worldwide were from renewable resources. To make the use of these materials more competitive, we work on product innovations based on renewable raw materials as well as on enhancing production processes in reaction technology and preparation.

We also further promoted our “mass balance” method on the market in 2015. This approach uses renewable raw materials from certified sustainable production from the very beginning of the value chain in the existing Production Verbund in order to save fossil resources. The proportion of renewable raw materials is allocated to customer-selected products according to their formulations. The quality of the final product remains unchanged. This method is currently being applied for numerous BASF products – for example, for superabsorbents, dispersions, plastics such as polyamides and polyurethanes, and for intermediates available on the market as “drop-in products.” These can be used in place of previously employed products in the production process without having to change the process itself.

Since 2013, we have provided our customers with 1,4-butanediol (BDO) on a commercial scale using sugars as a renewable feedstock based on a licensing agreement with the U.S. company Genomatica Inc. BDO and its derivatives are used, for example, to manufacture plastics for the automotive and textile industries. We use BDO produced with the Genomatica license to make bio-based polytetrahydrofuran 1000 (PolyTHF® 1000), which we offered to customers for testing purposes for the first time in 2015. PolyTHF® 1000 primarily serves as a chemical component in thermoplastic polyurethane (TPU), an ingredient used to manufacture skis and roller skates, shoe soles, dashboard films in the automotive industry, and many other products.

In 2015, we completed our joint project with Cargill and the German governmental agency for international cooperation on the sustainable production of coconut oil in the Philippines. Small farmers now produce the world's first Rainforest Alliance-certified dried coconut meat (copra), from which the oil is extracted.

Palm oil, palm kernel oil, and their derivatives are some of our most important renewable raw materials. We want to ensure that the raw materials we use stem from sustainable, certified sources and actively support the Roundtable on Sustainable Palm Oil (RSPO). In 2015, we revised and expanded our voluntary commitment to the sustainable procurement of palm oil products. This is to contain guidelines for procuring palm oil and palm kernel oil, as well as their primary derivative products. The guidelines involve requirements for protecting and preserving forests and peatland, along with the involvement of local residents in decision-making processes. In order to further increase the availability of sustainable, RSPO-certified palm oil and palm kernel oil, we will involve more and more small farmers by supporting suitable projects. Our goal is to exclusively obtain palm oil and palm kernel oil that has been certified by the RSPO insofar as this is available on the market. The voluntary commitment has been expanded to include the most important intermediate products based on palm oil and palm kernel oil up through 2025; these include fractions and primary oleochemical derivatives as well as edible oil esters.

For more on our voluntary commitment, see [basf.com/en/palm-dialog](http://basf.com/en/palm-dialog)

## Mineral raw materials

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We procure a number of mineral raw materials, like precious metals, that we use to produce process and mobile emissions catalysts. In suspected cases, we investigate the origins of minerals – as defined in the Dodd Frank Act – to see if they come from conflict mines. We reserve the right to conduct an external audit and, if necessary, terminate our business relationship. The suppliers addressed have confirmed to us that they do not source minerals matching this definition from the Democratic Republic of Congo or its neighboring countries.

## Preserving ecosystems

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- **Our production sites reviewed for proximity to internationally protected areas**
- **BASF partnership supports preservation of biodiversity**

Biodiversity forms the foundation of ecosystem services. Internationally protected areas play a critical role in maintaining biodiversity around the world. This is why, in 2015, we once again investigated our production sites to discover which are located near internationally protected areas: 2% of production sites (excluding Oil & Gas) are adjacent to a Ramsar Site and 2% to a Category I, II or III protected area of the International Union for Conservation of Nature (IUCN). None of our production sites are adjacent to a UNESCO protected area. Our 2015 analyses revealed no impact of our activities on biodiversity in these areas. In 2016, we will review the evaluation methods we have used up to now in order to even better identify any relevant impacts in the future.

Furthermore, we promote projects that contribute to the preservation of biodiversity. These include, for example, the “Farm Network” – a partnership brought to life by BASF in 2002 between independent farms, environmental protection organizations, universities and agricultural technology suppliers. The partners concentrate on strengthening biodiversity as well as responsible use of water and soil in commercial agriculture. By developing practical and locally adaptable measures for modern farms, the Farm Network has already helped numerous farmers increase the biodiversity of birds and insects in their fields and save water and soil resources. The first Farm Network conference took place in 2015, where BASF invited experts from six European countries to share their experiences with new agricultural practices and strengthen their network.



# Safety, security, health and the environment

## Responsible Care Management System



We act responsibly as an integral part of society and have set out the framework for our voluntary commitments in our Responsible Care Management System. We never compromise on the safety and security of our employees, contractors and neighbors as well as our facilities, transportation and products.

### Strategy

- Revised and updated goals for safety, security, health and environmental protection

BASF's Responsible Care Management System comprises the global rules, standards and procedures for safety, security, health and environmental protection for the various stations along our value chain. Our regulations cover the transportation of raw materials, activities at our sites and warehouses, and distribution of our products as well as our customers' application of the products. At our sites, we address energy and climate protection as one of the topics covered by our energy management. Specifications for implementing these measures are laid out in binding directives that are introduced in consultation with employee representatives. These describe the relevant responsibilities, requirements and assessment methods. We regularly conduct audits to monitor our performance and progress. We use the findings from these audits for continual improvement.

We set ourselves ambitious goals for safety, security, health and environmental protection. Our guidelines and requirements are constantly updated. We revised our goals in 2015. For example, we replaced our previous goals for water with an expanded goal for sustainable water management. We introduced a new, ambitious goal for process safety, which aims to reduce the number of plant safety incidents. In addition, we set ourselves a new energy and climate protection goal for the global implementation of our energy management system. In this way, we can identify and launch measures to increase energy efficiency in an even more flexible manner, depending on local raw material and energy prices.

We assess potential risks and weak points in all areas ranging from research and production to logistics, and how these could affect the environment, the surrounding community or the safety and security of our employees. In our databases, we document accidents, near misses and safety-related incidents at our sites as well as along our transportation routes. We foster awareness of workplace safety and safe behavior in every individual with our worldwide safety initiatives.

For more on Responsible Care, see [basf.com/en/responsible-care](http://basf.com/en/responsible-care)

### Audits

- 130 environmental, safety and security audits conducted at 82 sites

Regular audits help ensure that standards are met for safety, security, health and environmental protection. We carry out audits at BASF sites and at companies in which BASF is a majority shareholder. We have defined our regulations for Responsible Care audits in a global Group directive. During our audits, we create a safety and environmental profile that shows if our performance is sufficient to properly address the existing hazard potential. If this is not the case, we agree on measures and conduct follow-up audits on their implementation soon afterward. One result of the audits showed the necessity of swiftly implementing new guidelines and processes, for example.

Our internal audit system complies with the standards for external auditing procedures ISO 19011 and OHSAS 18001. Worldwide, 180 BASF production sites are certified in accordance with ISO 14001 (2014: 191)<sup>1</sup>. We conducted short-notice audits on various topics worldwide in 2015, which included facility inspections and document reviews. In 2015, 130 environmental, safety and security audits were carried out at 82 sites, along with 68 short-notice audits on various topics at 44 sites in the BASF Group. We audited 53 sites with respect to occupational medicine and health protection.

For more on occupational safety and health protection, see page 100 onward



### Costs and provisions for environmental protection in the BASF Group (in million €)

	2015	2014
Operating costs for environmental protection	962	897
Investments in new and improved environmental protection plants and facilities <sup>1</sup>	346	349
Provisions for environmental protection measures and remediation <sup>2</sup>	538	621

<sup>1</sup> Investments comprise end-of-pipe measures as well as integrated environmental protection measures.

<sup>2</sup> Values shown refer to December 31 of the respective year.

<sup>1</sup> In addition to changes in the site portfolio, the decrease mainly resulted from the sites' aim to be certified in accordance with ISO 50001 due to our energy efficiency goal.

## Transportation and storage



Our regulations and measures for transportation and warehouse safety cover the delivery of raw materials, the storage and distribution of chemical products among BASF sites and customers, and the transportation of waste from our sites to the disposal facilities.

### Strategy

#### ■ New reporting approach on transportation incidents

In 2014, we had already nearly achieved our goal of reducing the number of worldwide transportation accidents per 10,000 shipments by 70% from 2003 to 2020. That is why we redesigned our reporting on transportation accidents in 2015. From now on, we are focusing on transportation incidents with dangerous goods spillages that significantly impacted the environment. We will report on dangerous goods leaks of BASF products in excess of 200 kilograms on public transportation routes, provided BASF arranged the transport. The global requirement for reporting on transportation incidents was adjusted accordingly and implemented worldwide.

### Transportation incidents

In 2015, there were two incidents resulting in product spillage of more than 200 kilograms of dangerous goods (2014: 5). None of these transportation incidents had a significant impact on the environment (2014: 1).

### Accident prevention and emergency response

- Revised questionnaire for assessing transportation safety of chemicals and gases on seagoing vessels
- Risk assessment conducted for shipments involving high hazard potential

We stipulate worldwide requirements for our logistics service providers and assess them in terms of safety and quality. In 2015, we evaluated around 500 companies in all regions. Our experts use our own evaluation and monitoring tools as well as internationally approved schemes.

We revised our questionnaire for the transportation of chemicals and gases on seagoing vessels to align with that of the Chemical Distribution Institute in 2015. Particular emphasis is placed on crew training and experience, especially in the selection of service providers.

We regularly evaluate the risks in transporting raw materials with high hazard potential using our global guideline. This is based on the guidelines of the European Chemical Industry Council, CEFIC.

### Activities in external networks

We are actively involved in external networks, which quickly provide information and assistance in emergencies. These include the International Chemical Environmental (ICE) initiative and the German Transport Accident Information and Emergency Response System (TUIS), in which BASF plays a coordinating role. In 2015, we provided assistance to other companies in around 200 cases worldwide. We apply the experience we have gathered to set up similar systems in other countries: For example, in 2015 we were able to connect our site in India to just such a system.

For more, see [basf.com/distribution\\_safety](http://basf.com/distribution_safety) and [basf.com/emergency\\_response](http://basf.com/emergency_response)





# Production



We never compromise on safety. For occupational and process safety as well as health protection and corporate security, we rely on comprehensive preventive measures as well as on the involvement of all employees and contractors. Our global safety and security concepts serve to protect our employees, contractors and neighbors as well as to prevent property damage and protect information and company assets. In this way, we help prevent production outages and damage to the environment.

## Strategy

- New or updated goals
- Worldwide safety standards
- Enhancement of safety culture

We have set ourselves ambitious goals for safety and health protection. In 2015, we revised our goal for occupational safety, making it even more ambitious. We continue to pursue our health protection goal. We have furthermore defined a new goal for process safety.

In our guidelines and requirements, we stipulate globally mandatory standards for safety, security and health protection. A global network of experts supports us in their implementation through standardized processes. We regularly conduct audits on safety, security, health and environmental protection in order to monitor our performance. We especially promote safe conduct at work through systematic risk assessments and specific qualification measures.

Based on our corporate values, leaders serve as safety role models for our employees. Together, they contribute to the constant development of our safety culture.

## Occupational safety

- Expanded occupational safety goal
- Employees and contractors worldwide receive training on safe behavior
- Directive updated for contract manufacturing

In 2015, we expanded our goal for occupational safety. We want to reduce the worldwide lost-time injury rate per million working hours to at least 0.5 by 2025 (previous 2020 goal: 0.65). In order to achieve this ambitious goal, we rely on the further development of our global safety culture, the commitment of all employees, and clearly defined safety standards. In 2015, 1.4 work-related accidents per one million working hours occurred at BASF sites worldwide (2014: 1.5), of which 8% were related to chemicals. We conduct special training in this area in order to enhance our employees' qualifications. The work-related lost-time injury rate for contractors was 1.5 in 2015 (2014: 1.8).

Unfortunately, there were two fatal work-related accidents in 2015. In May, one employee of a contracting company succumbed to injuries sustained after falling from a scaffolding in Nanjing, China. In October, an employee in Ludwigshafen, Germany died from inhaling a low-oxygen gas mixture.

### 2025 Goal

Reduction of worldwide lost-time injury rate per one million working hours

≤0.5

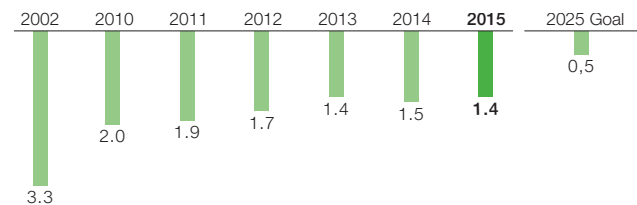
We revised our global directive for contract manufacturing in 2015, including the new definition of audit processes on compliance with stipulated standards on safety, security, health and environmental protection.

We bolstered our safety culture in 2015 through intensive exchange and a worldwide safety initiative – the Global Safety Days – involving over 700 activities that focused on key topics like risk assessment and business travel safety. Around 75,000 employees and contractors actively participated at over 400 sites.

Going beyond legally prescribed safety instructions, we provided more than 77,000 participants around the world with training on occupational safety in 2015. For example, we trained more than 13,000 participants at our “Safety Champions Training Center” at the Ludwigshafen site in order to promote safety-conscious behavior and prevent work-related accidents.

For more on occupational safety, see [basf.com/occupational\\_safety](http://basf.com/occupational_safety)

Lost-time injury rate per one million working hours



## Health protection

- 2015 focuses on nutrition
- Regular health promotion programs offered to employees

Our global health management serves to promote and maintain the health and productivity of our employees. This was supported by numerous emergency drills and health promotion measures in 2015.

We measure our performance in health protection using the Health Performance Index (HPI). The HPI comprises five components: confirmed occupational diseases, medical emergency drills, first aid training, preventive medicine and health promotion. Each component contributes a maximum of 0.2 to the total score. The highest possible score is 1.0. Our goal is to reach a value of more than 0.9 every year.

### Annual goal

**Health protection**  
Health Performance Index  
Maximum score 1.0

>0.9

With an HPI of 0.97, we were once again able to fulfill the ambitious goal of exceeding 0.9 each year (2014: 0.91). Our 2015 global employee health campaign centered on nutrition. Numerous offers and initiatives promoting good nutrition support our employees' health and performance, while making a contribution to BASF's voluntary commitment to the United Nations' Global Nutrition Compact. In 2016, the global health campaign will focus on heart attack and stroke prevention. We raise employee awareness of these topics through offers tailored toward specific target groups.

The BASF health checks form the foundation of our global health promotion program and are offered to employees at regular intervals.

For more on occupational medicine, health promotion campaigns and the HPI, see [basf.com/health\\_protection](http://basf.com/health_protection)

## Process safety

- New process safety goal
- Initiative begun to reduce process safety incidents
- Special training methods introduced

We have implemented a worldwide guideline for the safe construction and operation of our plants as well as the protection of our employees and the environment. Our safety strategy is based on prevention. That is why, when designing a new facility, we apply a five-step review system from conception to startup. It involves early consideration of the most important aspects of safety and protection of health and the environment, and monitors these in every stage of planning. We use a risk matrix to assess potential incident probability and impact, and determine the appropriate protective measures.

In order to constantly improve the safety of our production facilities worldwide, we regularly update the safety concepts in all of our plants. We review their implementation in ten-year intervals in plants with a medium to high hazard potential. The documentation of these safety reviews was standardized through software in 2014, and introduced all over the world in 2015. Moreover, we further continued to supervise the process safety management system in all regions. We completed the worldwide implementation of our requirements for explosion protection in 2015.

The number of Process Safety Incidents has served as an important key performance indicator since 2008, and is largely based on the definition set by the European Chemical Industry Council (CEFIC). This KPI mainly tracks the release of substances, in addition to fire and explosions. In 2015, we recorded 2.1 process safety incidents per one million working hours (2014: 2.2<sup>1</sup>). In order to constantly improve, we set ourselves the goal in 2015 of achieving a rate of 0.5 or below by 2025. To this end, we began a worldwide initiative focusing on plant maintenance, repair and operation. We perform a detailed investigation into every incident, analyzing root causes and using the findings to derive suitable measures to take.

### 2025 Goal

**Reduction of worldwide process safety incidents**  
per one million working hours

≤0.5

<sup>1</sup> Deviation from BASF Report 2014 (2.1) due to information that became known over the course of the year



To strengthen safety awareness, we developed new training methods, global recommendations for training measures in 2015 and instructed more than 19,000 participants that year.

 For more on process safety, see [basf.com/process\\_safety](http://basf.com/process_safety)

## Hazard prevention and corporate security

- Requirements implemented for emergency response and fire prevention
- SPIDER Emergency Response and Information Center Verbund enhanced in Europe
- Online training introduced for information protection

In order to ensure uniformly high standards around the world for safety, security, health and environmental protection, we implemented our requirements for emergency response planning and fire prevention in the BASF Group in 2015. To be prepared for a potential incident in our production plants, we work with specific emergency response plans that involve – depending on the situation – partners and suppliers as well as cities, communities and neighboring companies.

We regularly check our emergency systems and drill procedures with employees, contractors and local authorities. Through 224 drills and simulations in 2015, we trained the participants in our emergency response measures, such as preventive fire protection.

In 2015, we enhanced our SPIDER Emergency Response and Information Center Verbund in Europe by improving expert involvement. This enables our specialists from the site fire department, emergency medical team, site security and environmental protection around Europe to work together even more quickly and reliably across different sites. Our central emergency response supports local emergency response units around the world and around the clock. We also have been using the KATWARN system at the Ludwigshafen site since 2015, an app-based warning system that serves as an additional communication channel to inform site employees of dangerous situations.

Through audits and reviews, we monitor the implementation of measures for the comprehensive protection of our employees and the company – for example, from loss of knowledge – as well as for the worldwide protection of our sites against third-party interference. All of our security personnel have been instructed on aspects of human rights related to site security, such as the right to liberty and security of person. We also require all contractors involved in this area to comply with human rights and we conduct regular inspections. As part of investment projects, we are performing comprehensive analyses of potential risks. In 2015, we standardized the use of security services even more across our European sites in order to increase effectiveness and efficiency. Business travelers, transferees, and local employees in countries with elevated security risks are informed about appropriate protection measures and individually counseled where necessary.

Due to the increasing risks associated with the use of information technology, we started a global campaign for employees to even better protect our company knowledge. This includes a new online platform that educates employees as to how they can use available information and communications technology in a secure manner. Our worldwide network of information protection officers comprises more than 600 employees. They support the implementation of our globally mandatory requirements and conduct seminars on secure behaviors. We provided information protection instruction to more than 3,000 participants in 2015. At the end of 2015, we began the introduction of an online training module for information and knowledge protection that is mandatory for all employees.

 For more on corporate security, see [basf.com/corporate-security](http://basf.com/corporate-security)

 For more on emergency response, see [basf.com/emergency\\_response](http://basf.com/emergency_response)



## Product stewardship



**We review the safety of our products from research to production, all the way to our customers' use of the products. We work continually to ensure that our products pose no risk to people or the environment when they are used responsibly and in the manner intended.**

### Strategy

- **Global directives with uniformly high standards for product stewardship**

We ensure uniformly high standards for product stewardship worldwide and our voluntary initiatives go beyond legal requirements. We monitor the compliance of our guidelines with regular audits.

We provide extensive information on our chemical sales products to our customers with safety data sheets in more than 30 languages. This is achieved with the help of a global database in which we maintain and evaluate continuously updated environmental, health and safety data for our substances and products. Our global emergency hotline network provides information around the clock.

We offer our customers training in the safe use of our products and keep them informed early on of any changes in regulations. For example, we were one of the first companies to offer product-specific information and solutions to pharmaceutical manufacturers on the topic of metallic contaminants, as well as web-based consultation to customers in the pharmaceutical industry and authorities. In the Crop Protection division, we provide special safety training to farmers. We expanded our stewardship program for banana farmers to Latin America, China and the Philippines, where on-site BASF experts show how crop protection products can be used and stored in an effective and safe manner for people and the environment.

With an eye on consumer protection criteria, we also work continuously with our customers on the optimization of our products. Furthermore, we use our Eco-Efficiency Analysis to advise our customers on the evaluation of product risks and support them in improving the carbon footprint of their products.

With our global risk assessment goal, we are supporting the implementation of initiatives such as the Global Product Strategy (GPS) of the International Council of Chemical Associations (ICCA). GPS is establishing worldwide standards and best practices to improve the safe management of chemical substances.

In addition, we are also involved in workshops and training seminars in developing countries and emerging markets. In 2015, for example, we conducted training sessions for chemical industry representatives on GPS in China and Thailand. In order to facilitate public access to information, we are participating in the setup of an ICCA online portal that provides more than 4,600 GPS safety summaries.

For more on GPS, see [basf.com/en/gps](http://basf.com/en/gps)

### Global goal

By 2020, we will conduct risk assessments for all substances and mixtures BASF sells worldwide in quantities of more than one metric ton per year. We already reached 67.8% of this goal in 2015 (2014: 61.4%). The risk associated with using a substance is determined by the combination of its hazardous properties and its potential exposure to people and the environment.

#### 2020 Goal

**Risk assessment of products**  
that we sell in quantities of more  
than one metric ton per year

>99%

### REACH and other legal requirements

- **Third registration phase of REACH in progress**

We are working continuously on registering substances produced in annual volumes between one and one hundred metric tons for the third phase of the E.U. chemicals regulation, REACH. We have already registered over 200 substances to this end. The registration phase should be completed by May of 2018. At the same time, we also constantly update the existing registration dossiers and support the relevant E.U. member state authorities in evaluating an increasing number of substances. When it comes to REACH, we maintain close contact with our customers and suppliers.

Another contribution BASF makes to international chemical safety is through our support of the United Nations' initiative to implement a Globally Harmonized System of Classification and Labeling of Chemicals. This has already been implemented in nearly every country in the world. It was also made mandatory in the United States in the middle of 2015, which was the reason we reclassified 36,000 products there.

For more on auditing of suppliers, see page 95

## Environmental and toxicological testing

### ■ Use of alternative and complementary methods for animal studies

Before launching products on the market, we subject them to a variety of environmental and toxicological testing. We apply state-of-the-art knowledge in the research and development of our products. We only conduct animal studies when they are required by law. In some cases, animal studies are stipulated by REACH and other national legislation outside the European Union in order to obtain more information on the properties and effects of chemical products.

We adhere to the specifications laid down by the German Animal Welfare Act as well as the requirements of the Association for Assessment and Accreditation of Laboratory Animal Care – the highest standard for laboratory animals in the world. We are continually developing and optimizing alternative and complementary methods, and we put these into practice wherever it is possible and approved by the authorities. BASF spent €2.7 million for this purpose in 2015. We use alternative and complementary methods in more than a third of our tests. Currently, 30 alternative methods are being used in our labs and another 12 are in the development stage. One focus area of our research in 2015 and subsequent years is the development of alternative methods for testing the potential of substances that negatively affect organisms' growth and development.

In 2015, our Experimental Toxicology and Ecotoxicology department received, together with partners, a grant to conduct one of the largest European collaborative projects for alternative methods. The project aims to develop alternative methods to the point that chemical risk assessments can be efficiently conducted with the least amount of animal testing possible.

🖨 For more on alternative methods, see [basf.com/alternative\\_methods](http://basf.com/alternative_methods)

## Management of new technologies

### ■ Continual safety research on nano- and biotechnology

Technologies such as nanotechnology or biotechnology offer solutions for key societal challenges – for example, in the areas of climate protection or health and nutrition.

We developed a “Nanotechnology Code of Conduct” that stipulates the safe handling of nanomaterials. We are constantly expanding our knowledge of nanomaterial safety. Over the past years, we have conducted more than 230 toxicological and ecotoxicological studies and participated in over 30 different projects related to the safety of nanomaterials. We published the results in 71 scientific articles. One important finding is that toxicity is determined not by the size of the particles but by the intrinsic properties of the substance.

In 2015, we published a framework for the specific testing of nanomaterials together with the European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC). We are working with the European Chemicals Agency (ECHA), the OECD and national authorities on its further development. In an E.U. project, we are collaborating with partners from science, industry and the authorities to develop an approach for the analytical identification of nanomaterials.

In the use of biotechnology, we follow the code of conduct of EuropaBio, the European association for biotechnology industries. We constantly improve our product safety activities in the field of biotechnology in order to effectively minimize potential risks and ensure that all standards and national laws are met. Our internal risk management is based on the protection of people, animals and the environment. To monitor the risks of working with biotechnology, we implemented a system that ensures compliance with standards and transparent processes at BASF.

🖨 For more on nanotechnology and the Nanotechnology Code of Conduct, see [basf.com/nanotechnology](http://basf.com/nanotechnology)

For more on biotechnology, see [basf.com/biotechnology](http://basf.com/biotechnology)



## Energy and climate protection



As an energy-intensive company, we are committed to energy efficiency and global climate protection. We want to reduce emissions along the value chain and utilize, for example, efficient technologies for generating steam and electricity, energy-efficient production processes, and comprehensive energy management. Our climate protection products make an important contribution toward helping our customers avoid emissions.

### Strategy

- We are committed to energy efficiency and global climate protection along the value chain

We want to reduce greenhouse gas emissions in our production and along the entire value chain. To this end, we have thoroughly analyzed the greenhouse gas emissions from our production in the past few years and implemented comprehensive reduction measures. This is how, for example, we have been able to significantly reduce nitrous oxide emissions since 1997.

Comparisons with European emissions trading benchmarks show that our greenhouse gas-intensive chemical plants operate at above-average efficiency. To supply our production sites with energy, we rely on highly efficient combined heat and power plants with gas and steam turbines, and on the use of heat released by production processes. Around 50% of BASF Group emissions in 2015 resulted from steam and electricity generation in our power plants as well as in our energy suppliers' power plants.

Our success also depends on the long-term security and competitiveness of our energy supplies. Furthermore, we are committed to energy management that helps us analyze and continue to improve the energy efficiency of our plants.

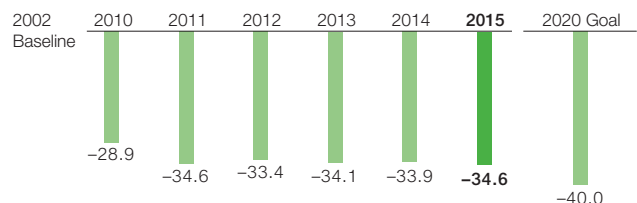
We offer our customers solutions that help prevent greenhouse gas emissions and improve energy and resource efficiency. About half of our total annual research spending goes toward the development of these products and the optimization of our processes.

Our climate protection activities are based on comprehensive emissions controlling. We report on greenhouse gas emissions in accordance with the Greenhouse Gas Protocol Standard, as well as the sector-specific standard for the chemical industry. We applied the new Scope 2 standard for the first time in 2015. According to CDP, an international organization that analyzes companies' climate protection data, BASF is among the top companies in the world in terms of transparency and completeness in climate protection reporting. In reporting to CDP, our experts perform an annual analysis of the opportunities and risks that climate change poses for BASF.

We also advocate economically efficient and environmentally effective climate protection by supporting endeavors to this effect. For example, we joined the U.N.'s Caring for Climate initiative in 2015 – with over 400 companies from 60 countries, this is the largest global business movement in the search for climate change solutions. BASF also advocates the Paris Agreement on climate protection and a global carbon price.

For more on climate protection, see [basf.com/climate\\_protection](http://basf.com/climate_protection)

**Reduction of greenhouse gas emissions per metric ton of sales product in BASF operations excluding Oil & Gas<sup>1,2</sup> (in %)**



<sup>1</sup> The figures for the 2010 and 2011 business years were not adjusted to the scope of consolidation as per the new accounting and reporting standards IFRS 10 and 11. For more information on our data collection methods, see page 6.

<sup>2</sup> The figures for the 2012 business year and earlier were not adjusted to the currently applied factors for global warming potential. For more information on our data collection methods, see page 106.

**BASF Group's greenhouse gas emissions according to the Greenhouse Gas Protocol<sup>1</sup>** (1,000 metric tons of CO<sub>2</sub> equivalents)

BASF operations including Oil & Gas	2002	2014	2015
Scope 1 <sup>2</sup>			
CO <sub>2</sub> (carbon dioxide)	14,634	16,774	16,496
N <sub>2</sub> O (nitrous oxide)	6,407	669	600
CH <sub>4</sub> (methane)	244	70	88
HFC (hydrofluorocarbons)	61	99	119
SF <sub>6</sub> (sulfur hexafluoride)	0	0	1
Scope 2 <sup>3</sup>			
CO <sub>2</sub>	5,243	3,911	3,795
<b>Total</b>	<b>26,589</b>	<b>21,523</b>	<b>21,099</b>
<b>Sale of energy to third parties (Scope 1)<sup>4</sup></b>			
CO <sub>2</sub>	347	838	1,071
<b>Total</b>	<b>26,936</b>	<b>22,361</b>	<b>22,170</b>

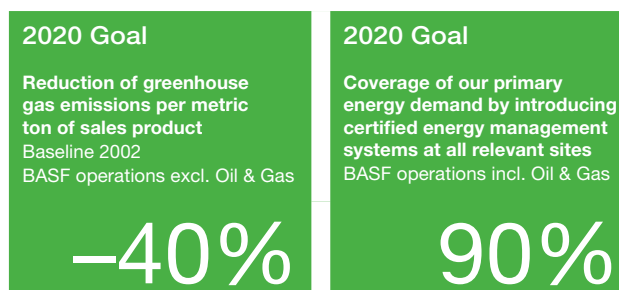
<sup>1</sup> BASF reports separately on direct and indirect emissions from the purchase of energy. Scope 1 emissions encompass both direct emissions from production and generation of steam and electricity, as well as direct emissions from the generation of steam and electricity for sale. Scope 2 emissions comprise indirect emissions from the purchase of energy for BASF's use.  
<sup>2</sup> Emissions of N<sub>2</sub>O, CH<sub>4</sub>, HFC and SF<sub>6</sub> have been translated into CO<sub>2</sub> emissions using the Global Warming Potential, or GWP, factor. GWP factors are based on the Intergovernmental Panel on Climate Change (IPCC) 1995 (2002 emissions) and IPCC 2007, errata table 2012 (2014 and 2015 emissions). HFC (hydrofluorocarbons) are calculated using the GWP factors of the individual components.  
<sup>3</sup> Location-based approach. Information on the calculation of market-based Scope 2 emissions can be found in the GRI and Global Compact Index; see basf.com/en/gri\_gc  
<sup>4</sup> Includes sale to BASF Group companies; as a result, emissions reported under Scope 2 can be reported again in some cases.

**Global goals**

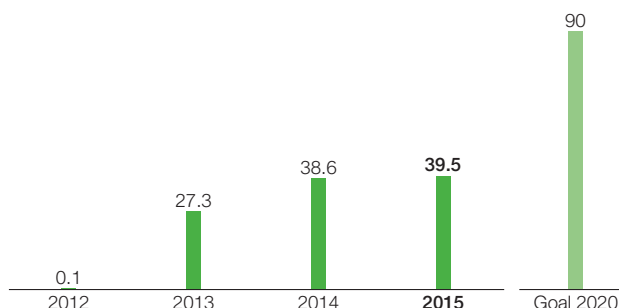
- Specific greenhouse gas emissions reduced
- New goal for energy management system

We aim to reduce our greenhouse gas emissions per metric ton of sales product by 40% by 2020, compared with baseline 2002. In 2015, we achieved a reduction of 34.6% (2014: reduction of 33.9%). Since 1990, we have been able to lower our overall greenhouse gas emissions from BASF operations (excluding Oil & Gas) by 49.8% and even reduce specific emissions by 74.4%.

We set ourselves a new energy efficiency goal in 2015 covering both the chemicals and the oil and gas businesses. By 2020, we want to have introduced certified energy management systems (DIN EN ISO 50001) at all relevant production sites<sup>1</sup>. Taken together, this represents 90% of BASF's primary energy demand. This is one of the ways in which we intend to identify and carry out improvements in energy efficiency, reducing not only greenhouse gas emissions and saving valuable energy resources, but also increasing the BASF Group's competitive ability. In 2015, we were able to complete the ISO 50001 energy management system certification of two additional sites in Germany. This brings the current total to 27 certified sites worldwide, representing 39.5% of our primary energy demand.



**Introduction of certified energy management systems (ISO 50001) at BASF Group sites worldwide, in terms of primary energy demand (in %)**



<sup>1</sup> The selection of relevant sites is determined by the amount of primary energy used and local energy prices.

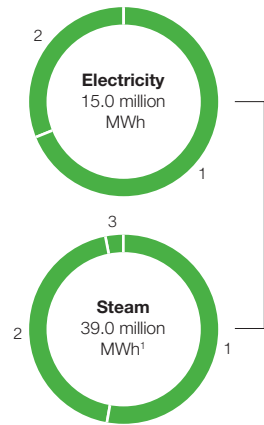
**Energy supply of the BASF Group 2015**

**Electricity supply**

1	Internally generated	69%
2	Purchased	31%

**Steam supply**

1	Internally generated	53%
2	Waste heat	44%
3	Purchased	3%



**Fossil and residual fuels used for power generation in power plants of the BASF Group**

83.0%	<b>Natural gas</b> 30.8 million MWh
0.6%	<b>Heating oil</b> 0.2 million MWh
2.7%	<b>Coal</b> 1.0 million MWh
13.7%	<b>Residual fuels</b> 5.1 million MWh
<b>Total:</b>	37.1 million MWh

<sup>1</sup> Conversion factor: 0.75 MWh per metric ton of steam

**Energy supply and efficiency**

■ **Verbund system as important component of our energy efficiency strategy**

Gas and steam turbines in our combined heat and power plants enable us to fulfill around 70% of the electricity demand of the BASF Group. Compared with separate methods of generating steam and electricity, we saved 13.5 million MWh of fossil fuels and prevented 2.7 million metric tons of carbon emissions in 2015. The Verbund system is an important component of our energy efficiency strategy: Waste heat from one plant's production process is used as energy in other plants. In this way, we saved around 17.6 million MWh in 2015, which corresponds to a savings of 3.5 million metric tons' worth of carbon emissions. With combined power and steam generation as well as our continuously enhanced Energy Verbund, we were thus able to prevent a total of 6.2 million metric tons of carbon emissions in 2015.

We were able to further optimize the resource and energy consumption of our production in numerous projects around the world in 2015. Various process improvements led to steam and electricity savings. At the Ludwigshafen site, for example, we implemented an integrated steam network between the ethanolamine facility and the Ultrason® plant, making use of significant amounts of heat. The startup of the new, gas-based combined heat and power plant at the Münster site of BASF Coatings additionally supported our endeavors toward efficient and environmentally friendly energy sourcing practices.

We also rely on locally available energy sources for energy supply at our sites. Especially in the growing Asian market, we and our energy suppliers also utilize coal as an energy source since the more climate-friendly natural gas is not available in sufficient quantities at competitive prices.

We are exploring the use of renewable energies. These can only become a permanent part of our energy mix if they are competitive in terms of supply security and cost. Our research also contributes to increasing the efficiency of technologies for the use of renewable energy sources. For example, Deutsche Nanoschicht GmbH – a 100% subsidiary of BASF – has developed an innovative method for producing high-temperature superconductors in a more efficient and environmentally friendly manner. Deutsche Nanoschicht will start operations at a further pilot plant at its Rheinbach, Germany, site in 2016. In cooperation with the Karlsruhe Institute of Technology, high-temperature superconductors are to be optimized for various applications in energy technology.



**Key indicators for energy and climate protection in BASF operations excluding Oil & Gas**

	Baseline 2002 <sup>1</sup>	2014	2015
Greenhouse gas emissions <sup>2</sup> (million metric tons of CO <sub>2</sub> equivalents)	24.713	20.550	20.133
Specific greenhouse gas emissions (metric tons of CO <sub>2</sub> equivalents per ton of sales product)	0.897	0.593	0.587
Primary energy demand <sup>3</sup> (million MWh)	55.759	58.962	57.262
Energy efficiency (kilograms of sales product per MWh)	494	588	599

<sup>1</sup> The values for baseline 2002 were not adjusted to reflect the currently applied global warming potential factors.

<sup>2</sup> Scope 1 and Scope 2 (location-based) according to the GHG Protocol Standard, excluding emissions from the generation of steam and electricity for sale to third parties; information on market-based Scope 2 emissions can be found in the GRI and Global Compact Index; see basf.com/en/gri\_gc

<sup>3</sup> Primary energy used in BASF's plants as well as in the plants of our energy suppliers to cover energy demand for production processes

**Corporate carbon footprint and climate protection products**

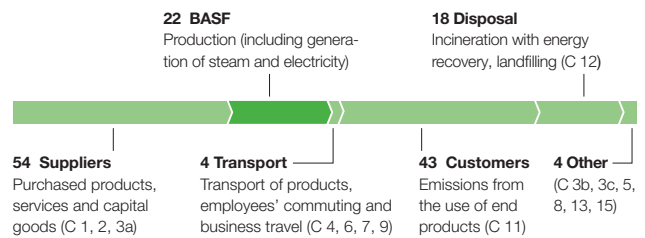
- Reporting on greenhouse gas emissions along the entire value chain
- Customers' use of climate protection products sold in 2015 avoids 530 million metric tons of CO<sub>2</sub> equivalents

BASF has been publishing a comprehensive corporate carbon footprint since as early as 2008. This reports on all emissions along the value chain and shows the volume of emissions prevented through the use of our climate protection products. We plan our climate protection activities along the value chain based on our corporate carbon footprint.

Through various measures to reduce our raw material and energy requirements, the emission of greenhouse gases associated with producing the raw materials was decreased by a total of around 160,000 metric tons in 2015.

We completed the systematic evaluation of our product portfolio in terms of sustainability considerations in 2015. This included identifying solutions whose application makes a positive contribution in terms of climate protection and energy. Dubbed "Accelerator" products, these are what we focus on when referring to climate protection products. They help us offer solutions to our customers to avoid greenhouse gas emissions over their entire lifecycle as compared with reference products. One example is our Kerapur® line of fuel additives, which reduces fuel consumption by optimizing combustion in comparison with conventional fuels.

**Greenhouse gas emissions along the BASF value chain in 2015<sup>1</sup>**  
(in million metric tons of CO<sub>2</sub> equivalents)



<sup>1</sup> According to Greenhouse Gas Protocol, Scope 1, 2 and 3; categories within Scope 3 are shown in parentheses

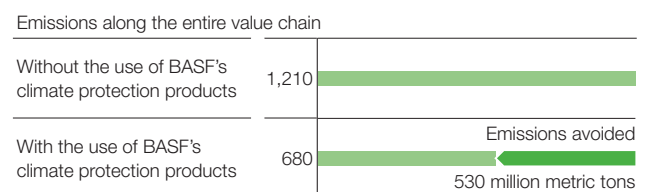
An analysis of 25 climate protection product groups revealed that customers' use of products sold in 2015 helped to avoid 530 million metric tons of CO<sub>2</sub> equivalents. Every product makes an individual contribution in the value chain of customer solutions. Value chains are assessed in terms of BASF's economic share of the respective customer solution. On average, 11% of the emissions avoided were attributable to BASF in 2015. The calculation of avoided greenhouse gas emissions was based on the chemical industry standard of the International Council of Chemical Associations (ICCA) and the World Business Council for Sustainable Development (WBCSD).

For more on our emissions reporting, see [basf.com/corporate\\_carbon\\_footprint](http://basf.com/corporate_carbon_footprint)

For more on the sustainability analysis of our product portfolio, see page 32 onward



**Prevention of greenhouse gas emissions through the use of BASF products** (in million metric tons of CO<sub>2</sub> equivalents)



# Water



**Water is of fundamental importance in chemical production. It is used as a coolant, solvent and cleaning agent, as well as to make our products. We are committed to its responsible use in our production sites' water catchment areas, and along the entire value chain. We have set ourselves a global goal for sustainable water management.**

## Strategy

- **BASF products contribute to sustainable water management**

We aim to use water as sparingly as possible and further reduce emissions to water. To do so, we have set out a Group directive with globally applicable standards. We are exploring measures for implementing sustainable water management, especially at production sites in water stress areas. One of our aims here is to identify savings potential in order to use as little water as possible, particularly in water stress areas. We consider this topic from all aspects, including societal implications.

We offer our customers solutions that help purify water, use it more efficiently and reduce pollution. Seawater desalination plants make an important contribution to supplying the world's population with water. The Middle East's dry climate, for example, makes the region particularly dependent on this technology. The largest desalination plant in the United Arab Emirates is located in Jebel Ali. BASF supplies it with more than 3,000 metric tons of Sokalan® PM 15l per year; this product prevents the buildup of deposits, enabling the plant to generate up to 2 million cubic meters of desalinated water each day.

In order to ensure transparency in our reporting on water, we once again took part in CDP reporting in 2015 and received a very good score. According to CDP, this was particularly because of our implementing a range of best-practice measures in water management, as well as our risk minimization – both in our production and beyond it.

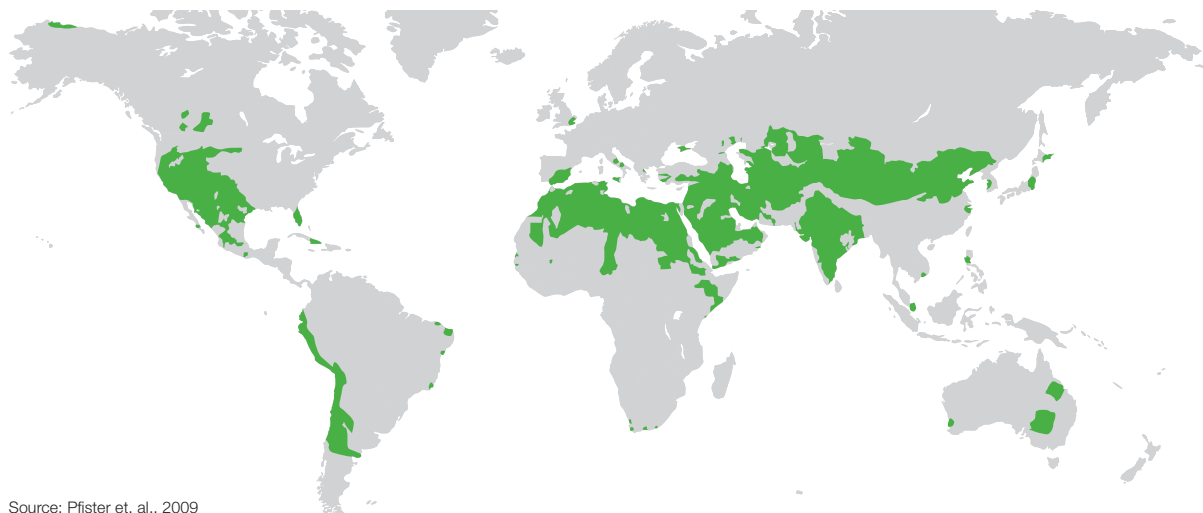
For more on the CDP water survey, see [basf.com/en/cdp](http://basf.com/en/cdp)

## Global goal

- **Goals achieved for reducing emissions**
- **Goal expanded for sustainable water management**

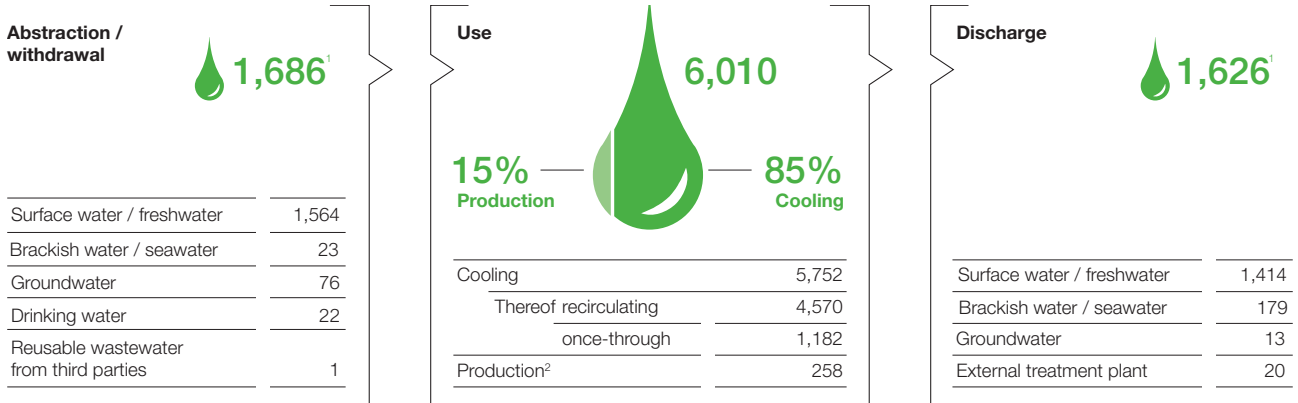
We have already achieved our 2020 goal of decreasing emissions to water of organic substances and nitrogen by 80% and of heavy metals by 60% compared with baseline 2002. In 2015, we reached 28.2% (2014: 26.3%) of our goal to halve the withdrawal of drinking water for production purposes from 2010 to 2020. We integrated this target into our goal for sustainable water management in 2015. We are analyzing water management practices at relevant production sites with respect to sustainability criteria. Our aim to establish sustainable water management at all sites in water stress areas was expanded in 2015: We now also want to introduce sustainable water management at all Verbund sites by 2025. This will cover 92% of BASF's entire water abstraction. We achieved 36.2% of this goal in 2015, and are pursuing it through the application of the European Water Stewardship (EWS) standard. After introducing the standard at our European sites in 2013, we furthered its implementation in China and North and South America in 2015. This once again earned gold-level certification in 2015 for our production site in Tarragona, Spain, after an external audit.

## Water stress areas around the world



Source: Pfister et. al., 2009

**Water in the BASF Group 2015** (million cubic meters per year)



<sup>1</sup> The difference between the volume of water drawn and the volume discharged is primarily attributable to evaporation losses during closed-circuit cooling.

<sup>2</sup> Total from production processes, graywater, rinsing and cleaning in production

Around 22% of our production sites were located in water stress areas in 2015, and around 1% of BASF's total water supply was abstracted from these areas.

**2025 Goal**

Introduction of sustainable water management at all production sites in water stress areas and at all Verbund sites  
 BASF operations excl. Oil & Gas

**100%**

**Further reduction of emissions**

■ **Reduction of emissions to water achieved**

A total of around 207 million cubic meters of wastewater were discharged from BASF production sites in 2015 (2014: 194 million cubic meters). Emissions of nitrogen to water amounted to 3,000 metric tons (2014: 3,200 metric tons). We were able to make this improvement by optimizing processes and exchanging products, for example. Around 17,300 metric tons of organic substances were emitted in wastewater (2014: 18,700 metric tons). Our wastewater contained 25 metric tons of heavy metals (2014: 21.5 metric tons). Phosphorus emissions amounted to 460 metric tons (2014: 341 metric tons).

Our wastewater is treated through different methods depending on the type and degree of contamination – including biological processes, oxidation, membrane technologies, precipitation or adsorption.

In order to prevent unanticipated emissions and the pollution of surface or groundwater, we create water protection strategies for our production sites. This is mandatory for all production plants as part of the Responsible Care initiative. The wastewater protection plans involve evaluating wastewater in terms of risk and drawing up suitable monitoring approaches. We use audits to check that these measures are being implemented and complied with.

**Water use**

■ **Using water responsibly**

We recirculate water as much as is feasible in order to withdraw less from supply sources. Our larger sites have recooling plants that allow water to be reused several times and that reduce the temperature of used cooling water before it is discharged back into a body of water.

The supply, treatment, transportation and recooling of water is associated with a high energy demand. We employ various means in our efforts to keep this as low as possible. We are constantly working to optimize our energy consumption and the amount of water we use, and to adapt to the needs of our business and the environment.

For more, see [basf.com/water](http://basf.com/water)



## Air and soil



We want to further reduce emissions to air from our production, protect the soil and prevent waste. We have set ourselves standards for doing so in a global directive. If no recovery options are available, we dispose of waste in a correct and environmentally responsible manner.

### Strategy

- Raw Material Verbund helps prevent and reduce waste
- Professional disposal of hazardous waste

Regular monitoring of our emissions to air is a part of environmental management at BASF. Aside from greenhouse gases, we also measure emissions of other pollutants into the atmosphere. Our reporting does not take into account air pollutant emissions from oil and gas operations due to their substantial fluctuation during exploration phases.

Our Raw Material Verbund helps us prevent and reduce waste. We regularly carry out audits to inspect external waste management companies, ensuring that our hazardous waste in particular is properly disposed of. In this way, we are also contributing to preventive soil protection and keeping today's waste from becoming tomorrow's contamination.

### Emissions to air

#### ■ Further reduction of emissions

We were able to reduce absolute emissions of air pollutants from our chemical plants to 28,585 metric tons in 2015. This is a decrease of 66.6%, which means that our goal of a 70% reduction worldwide from 2002 to 2020 has almost been achieved. Emissions of ozone-depleting substances as defined by the Montreal Protocol totaled 23 metric tons in 2015 (2014: 36 metric tons). Emissions of heavy metals amounted to 4 metric tons (2014: 4 metric tons).

We were able to reduce emissions of sulfur oxides in 2015, particularly at our site in Hannibal, Missouri: There, we exchanged coal-fired boilers for gas-powered burners, saving around 1,000 metric tons of sulfur oxide.

Our product portfolio contains a variety of catalysts used in the automotive sector and in industry to reduce the emission of air pollutants. BASF's Camet® series of CO catalysts, for example, decreases the amount of carbon monoxide released by gas turbine plants in partial-load mode. As a complement to the use of renewable energies, this now environmentally friendly partial-load mode will become increasingly necessary in the future.

#### Emissions to air (in metric tons)

Air pollutants from BASF operations excluding Oil & Gas

	2015	2014
CO (carbon monoxide)	3,813	4,635
NO <sub>x</sub> (total NO <sub>2</sub> [nitrogen dioxide] + NO [nitrogen monoxide], calculated as NO <sub>2</sub> )	11,058	11,697
NM VOC (nonmethane volatile organic compounds)	5,140	4,881
SO <sub>x</sub> (total various sulfur oxides)	3,028	4,506
Dust	3,330	3,456
NH <sub>3</sub> / other (NH <sub>3</sub> [ammonia] and other inorganic substances)	2,216	2,321
<b>Total</b>	<b>28,585</b>	<b>31,505</b>

## Management of waste and contaminated sites

- Reduction of total waste volume
- Systematic processing of contaminated sites ensured

We regularly explore possibilities for preventing waste. If waste is unavoidable, we perform an analysis for recycling or energy recovery. Total waste volume declined slightly in 2015 (–2.4%).

We develop remediation solutions in order to combine nature conservation, climate protection concerns, costs, and social responsibility. This means making decisions on a case-by-case basis, founded on the legal framework and current technological possibilities. We set out global standards for our approach to contaminated site management. A worldwide network of experts ensures their proper implementation.

We have been documenting relevant sites in a contaminated site database since 2013. Ongoing remediation work around the world continued on schedule and planning was concluded on future landfill remediation projects.



### Waste management in the BASF Group (in million metric tons)

	2015	2014
<b>Total waste generation<sup>1</sup></b>	<b>2.02</b>	<b>2.07</b>
Thereof from oil and gas exploration	0.05	0.05
<b>Waste recovered</b>	<b>0.68</b>	<b>0.71</b>
Recycled	0.27	0.30
Thermally recovered	0.41	0.41
<b>Waste disposed of</b>	<b>1.34</b>	<b>1.36</b>
In underground landfills	0.14	0.12
In surface landfills	0.48	0.52
Through incineration	0.72	0.72
<b>Classification of waste for disposal<sup>2</sup></b>		
Nonhazardous waste	0.44	0.42
Hazardous waste	0.90	0.94
Transported hazardous waste	0.27	0.23

<sup>1</sup> Comprises all production waste and hazardous waste from construction activities

<sup>2</sup> The classification of waste into hazardous and nonhazardous waste is performed according to local regulations.