Forecast

Economic Environment in 2019

In a challenging environment characterized by a high level of uncertainty, the global economy is expected to grow by 2.8% in 2019, slower than in 2018 (+3.2%). In the European Union (E.U.), we anticipate weaker increases in both domestic demand and export demand from third countries. The United States will presumably deliver solid growth, although the stimulus effects of the tax reform should be less pronounced than in 2018. Growth in China will continue to cool but remain high compared with the advanced economies. The economic recovery in Brazil is expected to hold up. We expect growth in key customer industries to continue. For the automotive industry, we anticipate a slight recovery after lower production in the previous year. Global chemical production is forecast to grow by 2.7% in 2019, roughly at the same rate as in 2018 (+2.7%). For 2019, we expect an average oil price of $70 per barrel for Brent crude and an exchange rate of $1.15 per euro.

Our macroeconomic forecasts are based on the assumption that the trade conflict between the United States and its trading partners will ease over the course of the year, and that Brexit will occur without wider economic repercussions.

Trends in the global economy in 2019

- **Slower growth forecast for the E.U. and the United States**
- **Growth moderation expected in China**
- **Continuation of recovery in Brazil**

Our forecasts for the **E.U.** assume that the United Kingdom will leave the E.U. in 2019, followed by a transitional period lasting until at least the end of 2020. The slowdown in growth already apparent in 2018 is likely to continue in the E.U. (the E.U. 27 and the United Kingdom[1]); however, we continue to expect moderate growth overall. Both export and domestic demand should see weaker growth. Germany in particular will be negatively impacted by slower growth in demand for investment goods, with GDP growth rates slightly below the E.U. average. As growth of eastern E.U. countries benefited particularly strongly from new inflows of E.U. cohesion and structural funds in 2017 and 2018, growth will presumably decline more strongly than in western Europe. For Russia, we expect weaker GDP growth compared with the previous year.

We are forecasting slower economic momentum for the **United States**, although this will still be significantly above the long-term average. The impetus from the tax reform should slowly taper off. Consumer purchasing power will presumably be curbed by higher prices as a result of the hike in import duties on Chinese goods, while wages continue to see only moderate gains.

Growth in the **emerging markets of Asia** is also expected to weaken slightly. Many Asian markets have close links to China through foreign trade, so the anticipated growth moderation in **China** is a major factor. We expect higher trade tariffs with the United States to dampen export demand and negatively impact investment propensity. However, the Chinese economy should be supported by income and sales tax cuts as well as tax concessions for the private sector. We anticipate growth of just over 6% for China (2018: +6.6%).

In **Japan**, growth is expected to remain at the low prior-year level. Domestic demand should remain stable, although capacity bottlenecks will have a dampening effect on growth. The expected slowdown in China will curb export demand. In addition, the sales tax will be raised in October 2019, which should lead to lower consumer demand in the fourth quarter.

In **South America**, we expect the recovery in Brazil to continue, provided the newly elected president pursues a liberal, reform-oriented economic course. By contrast, the Argentinian economy will likely continue to contract as domestic demand suffers from high inflation.

1 In the rest of this chapter, "E.U." refers to the E.U. 27 and the United Kingdom.

Outlook for gross domestic product 2019

Real change compared with previous year

World	2.8%
European Union	1.4%
United States	2.3%
Emerging markets of Asia	5.8%
Japan	0.8%
South America	1.8%

Trends in gross domestic product 2019–2021

Average annual real change

World	2.9%
European Union	1.5%
United States	2.0%
Emerging markets of Asia	5.7%
Japan	0.7%
South America	2.5%

Outlook for key customer industries

- **Weaker growth expected in global industrial production**

Overall, we expect global industrial growth to be weaker in 2019, at 2.7% (2018: +3.2%). The trajectory should slow in both the advanced economies as well as in the emerging markets.

We expect the **transportation industry** to return to growth after a slight decline in production in the previous year. In the E.U., automotive production will presumably decline again slightly; a slight decline in western Europe should contrast with moderate growth in the eastern E.U. countries. For North America, we are again forecasting weak growth after the slight decrease in 2018. In Asia, too, we anticipate a slight recovery overall, as the expiry of the tax incentives will no longer be felt in China and economic stimuli should take effect. Dynamic growth is again forecast for India. In Japan and South Korea, automotive production should return to positive territory in 2019 after contracting in the previous year. By contrast, growth in South America will likely decline following the strong recovery effects in prior years.

In the **energy and raw materials sector**, we anticipate slightly weaker production growth for 2019. The main driver is the lower growth rate forecast for utilities – which accounts for over 40% of value added in the sector – compared with 2018. This was partly attributable to the extraordinary weather conditions in 2018, which led to unusually high electricity and water consumption.

We anticipate largely stable global growth in the **construction industry** with wide regional variance. Construction in western Europe will soften somewhat, partly due to capacity bottlenecks (Germany) and partly to the limitations of subsidy programs (France). Private sector construction activity in the United Kingdom is expected to remain sluggish due to macroeconomic uncertainty. By contrast, the construction industry in eastern Europe should remain dynamic with strong growth rates, although weaker than in the previous year. We are again seeing a weak development in the United States against a backdrop of rising mortgage rates and construction costs, while growth in Asia is expected to remain stable at a high level, especially in infrastructure. In South America, we anticipate stronger growth in line with the ongoing economic recovery in Brazil.

Growth in consumer goods production should remain stable. Although global GDP growth – the most important demand driver – is likely to decline slightly, demand for consumer goods should stabilize on the back of rising private incomes. The expected regional differences in growth should follow the GDP trends described above.

The **electronics industry** will continue to benefit from increasing digitalization and automation, posting the highest growth rates of all customer industries. Production is concentrated in Asia and North America. However, growth is expected to weaken in both Asia and the United States. Overall, this will lead to a significant slowdown in global growth.

We continue to forecast above-average growth in the **health and nutrition** sector, albeit slightly weaker than in the previous year. The expected decline in growth in the food industry is largely in line with the development of GDP. The pharmaceutical industry will presumably see a stronger decline in growth. Base effects play an important role there, since value creation in a number of countries – including Germany – rose exceptionally strongly in the previous year due to the introduction of new, high-value medications.

We expect stronger growth in **agricultural production** in 2019 compared with the previous year after 2018 yields were negatively impacted by the unusual dry period in central and eastern Europe, parts of North America as well as in Argentina and South Africa.

Outlook for the chemical industry

- **Global growth in chemical industry roughly at level of previous year**

Global chemical production (excluding pharmaceuticals) is expected to grow by 2.7% in 2019, on a level with 2018 (+2.7%). For 2019, we anticipate a similar expansion rate in the advanced economies as in the previous year (2018: +1.5%; 2019: +1.6%) and slightly slower growth in the emerging markets (2018: +3.4%; 2019: +3.3%).

The development of the world's largest chemical market – **China** – has a significant impact on the global growth rate. Our forecast assumes that chemical production in China will grow by 3.6%, about as fast as in the previous year in a slightly weaker global economic environment overall. A stabilization of automotive demand in China should support demand for chemicals. Based on its large share of the global market of around 40%, China alone would therefore still account for almost 60% of global chemical growth. Chemical production growth in the remaining emerging markets of Asia is expected to be similar to that in China.

For the **E.U.**, we anticipate a recovery in chemical production over the course of 2019 following the slump at the end of 2018. However, we only expect production to be flat compared with the full-year 2018. Demand from the automotive industry will presumably continue to decline slightly. Agriculture should see renewed growth. In the construction industry, too, growth is expected to remain solid. Base effects should also have a positive impact.

In the **United States**, we expect slightly lower, but still above-average growth in chemical production in the coming year. Ongoing capacity expansions will strengthen the supply side while on the demand side, industry growth will be slightly weaker.

We expect slightly stronger chemical growth in **Japan**, driven by domestic demand and, in part, by exports to China.

For **South America**, we anticipate an upturn in chemical production in line with the macroeconomic recovery in Brazil.

Outlook for chemical production 2019 (excluding pharmaceuticals)

Real change compared with previous year

World	2.7%
European Union	0.1%
United States	3.2%
Emerging markets of Asia	3.6%
Japan	2.0%
South America	1.5%

Trends in chemical production 2019–2021 (excluding pharmaceuticals)

Real change compared with previous year

World	3.0%
European Union	0.8%
United States	2.9%
Emerging markets of Asia	4.2%
Japan	0.8%
South America	2.0%

Outlook 2019

We expect weaker global economic growth in 2019 compared with 2018. At 2.8%, global GDP growth will presumably be slower than in 2018 (+3.2%). Chemical production is expected to increase at a rate of 2.7%, on a level with the previous year (+2.7%). We anticipate an average oil price of $70 for a barrel of Brent blend crude and an exchange rate of $1.15 per euro. Despite the challenging environment characterized by a high level of uncertainty, we aim to grow profitably and slightly increase the BASF Group's sales and income from operations (EBIT) before special items in 2019. The return on capital employed (ROCE) should slightly exceed the cost of capital percentage but decline slightly compared with 2018.

We expect growth in our customer industries to continue. For the automotive industry, we anticipate a slight recovery after lower production in the previous year. Our outlook assumes that the trade conflict between the United States and its trading partners will ease over the course of the year, and that Brexit will occur without wider economic repercussions.

For more information on our expectations for the economic environment in 2019, see page 117 onward

Sales, earnings and ROCE forecast for the BASF Group[1]

- **Slight sales growth, mainly from higher sales volumes and portfolio effects**
- **EBIT before special items slightly above prior-year level**
- **ROCE slightly higher than cost of capital percentage**

We have based the outlook on the segment structure as of January 1, 2019, and adjusted the segment data for 2018 accordingly. In addition to the new segment structure, the composition of a number of divisions has also changed.

For more information on the new segment structure, see The BASF Group on page 19 and Note 4 to the Consolidated Financial Statements from page 211 onward

Our forecast for 2019 takes into account the definitive agreement between BASF and LetterOne to merge their oil and gas businesses. Closing of the transaction is expected in the first half of 2019, subject to the required regulatory approvals. Until closing, the earnings of our oil and gas business will be presented as a separate item, income after taxes from discontinued operations, and will not be included in the sales or EBIT before special items of the BASF Group. After closing, the pro rata share of income after taxes of the joint venture, Wintershall DEA, will be reported as income from companies accounted for using the equity method in the BASF Group's EBIT before special items, presented under Other.

This outlook also includes the acquisition of Solvay's integrated polyamide business, which is expected in the second half of 2019. However, we currently do not expect this transaction to have any material effect on sales, EBIT before special items or ROCE at the level of the BASF Group in 2019.

We anticipate slightly higher sales for the BASF Group in 2019. The main contributing factors should be volumes growth and portfolio effects, especially from the acquisition of significant businesses from Bayer that was closed in August 2018. We expect considerable sales growth in the Agricultural Solutions and Nutrition & Care segments as well as in Other, and slightly higher sales in the Surface Technologies and Materials segments. Sales in the Chemicals segment are expected to be on a level with the previous year. Our planning for the Industrial Solutions segment assumes slightly lower sales due to the transfer of BASF's paper and water chemicals business to the Solenis group as of January 31, 2019.

EBIT before special items will presumably be slightly above the 2018 level. This will largely reflect significantly higher contributions from the Agricultural Solutions, Industrial Solutions, Surface Technologies and Nutrition & Care segments. We are forecasting a slight improvement in earnings in the Chemicals segment. In the Materials segment, by contrast, we anticipate considerably lower EBIT before special items, driven by a decline in margins in the isocyanates business. We also expect the earnings generated by Other to be considerably below the prior-year figure. Positive measurement effects for our long-term incentive program arose in 2018, which we do not expect in 2019.

In 2019, we expect to achieve a ROCE slightly above the underlying cost of capital percentage of 10%. The average cost of capital basis will increase in 2019 due to the full-year inclusion of the assets acquired from Bayer in August 2018. As a result, we expect the BASF Group's ROCE to decline slightly, i.e., at most one percentage point compared with the previous year. In 2018, ROCE amounted to 11.5% adjusted to the new segment structure. Compared with the previous year, we expect a considerable decline in ROCE in the Materials segment (2018: 26.1%) and a slight decrease in the Chemicals segment (2018: 17.7%). By contrast, we anticipate slight year-on-year increases in the Surface Technologies (2018: 4.6%), Nutrition & Care (2018: 11.8%) and Agricultural Solutions (2018: 5.1%) segments, and a considerable increase in the Industrial Solutions segment (2018: 8.7%).

The significant risks and opportunities that could affect our forecast are described in Opportunities and Risks on pages 123 to 130. Achievement of our sales and earnings forecast largely depends on the accuracy of our macroeconomic assumptions for 2019.

1 For sales, "slight" represents a change of 1–5%, while "considerable" applies to changes of 6% and higher. "At prior-year level" indicates no change (+/–0%). For earnings, "slight" means a change of 1–10%, while "considerable" is used for changes of 11% and higher. "At prior-year level" indicates no change (+/–0%).
At a cost of capital percentage of 10% for 2018 and 2019, we define a change in ROCE of 0.1 to 1.0 percentage points as "slight," a change of more than 1.0 percentage points as "considerable" and no change (+/–0 percentage points) as "at prior-year level."

Forecast by segment[1,2]

Million €

	Sales		Income from operations (EBIT) before special items	
	2018	**Forecast 2019**	**2018**	**Forecast 2019**
Chemicals	11,694	at prior-year level	1,587	slight increase
Materials	13,270	slight increase	2,400	considerable decline
Industrial Solutions	9,120	slight decline	668	considerable increase
Surface Technologies	13,655	slight increase	690	considerable increase
Nutrition & Care	5,940	considerable increase	736	considerable increase
Agricultural Solutions	6,156	considerable increase	734	considerable increase
Other	2,840	considerable increase	(462)	considerable decline
BASF Group	**62,675**	**slight increase**	**6,353**	**slight increase**

1 For sales, "slight" represents a change of 1–5%, while "considerable" applies to changes of 6% and higher. "At prior-year level" indicates no change (+/–0%). For earnings, "slight" means a change of 1–10%, while "considerable" is used for changes of 11% and higher. "At prior-year level" indicates no change (+/–0%).
2 We have based the outlook on the segment structure as of January 1, 2019, and adjusted the segment data for 2018 accordingly. In addition to the new segment structure, the composition of a number of divisions has also changed.

Sales and earnings forecast for the segments

In the **Chemicals** segment, we expect sales to reach the prior-year level in 2019. We anticipate higher volumes, especially of styrenes, plasticizers and oxo alcohols in the Petrochemicals division, and of amines and polyalcohols in the Intermediates division. By contrast, we expect lower volumes of steam cracker products due to scheduled shutdowns of the steam crackers in Port Arthur, Texas; Antwerp, Belgium; and Ludwigshafen, Germany. EBIT before special items will presumably be slightly above the 2018 level: In particular, we are forecasting improved margins in the butanediol value chain in the Intermediates division, as well as for acrylic acid and its derivatives in the Petrochemicals division.

We expect sales in the **Materials** segment to be slightly above the prior-year level in 2019. In the Performance Materials division, we anticipate stronger volumes and higher prices on average. This should more than offset the significantly lower prices in the isocyanates business in the Monomers division as a result of additional capacities from competitors, especially in the Middle East and Asia. In addition, the acquisition of Solvay's integrated polyamide business is expected to deliver a positive contribution in the second half of 2019. We anticipate considerably lower EBIT before special items compared with 2018, driven mainly by the expected decline in margins in the isocyanates business.

Sales in the **Industrial Solutions** segment will likely decrease slightly in 2019. We expect a considerable decline in sales in the Performance Chemicals division due to the transfer of BASF's paper and water chemicals business to the Solenis group as of January 31, 2019. The higher volumes and prices forecast in the Performance Chemicals division's remaining businesses as well as in the Dispersions & Pigments division and will not be able to completely compensate for this. Despite the continued challenging market environment, we anticipate a considerable increase in EBIT before special items for the segment, mainly from higher volumes and stronger margins.

In the **Surface Technologies** segment, sales should rise slightly as a result of volumes growth and higher prices. Despite the challenging market situation, especially in the automotive industry, we expect sales to increase in all divisions. We aim to considerably increase EBIT before special items, primarily with improved margins and strict cost discipline.

For the **Nutrition & Care** segment, we anticipate considerably higher sales than in 2018, largely from volumes growth in both divisions. In the Nutrition & Health division in particular, our planning assumes improved product availability following the restart of the citral plant in Ludwigshafen, Germany, and the ibuprofen plant in Bishop, Texas, as well as the startup of the menthol plant in Kuantan, Malaysia. We also expect EBIT before special items to considerably exceed the prior-year figure, mainly from higher sales volumes. Softer margins for vitamins and the absence of insurance refunds compared with the previous year will have an offsetting effect.

Despite the continuing challenging market environment, we anticipate considerable sales growth in the **Agricultural Solutions** segment due in particular to the businesses acquired from Bayer and higher volumes. We also expect a considerable increase in EBIT before special items overall. In 2019, we will launch a program to boost efficiency to offset factors such as the rise in fixed costs. We will also continue to invest at a high level in research and development and digitalization.

Sales in **Other** are expected to increase considerably in 2019, mainly as a result of higher volumes in raw materials trading. For EBIT before special items, we are forecasting a figure considerably below the previous year due to the positive measurement effects for our long-term incentive program that arose in 2018, which we do not expect in 2019.

Capital expenditures

- **Capex of around €3.8 billion planned for 2019**

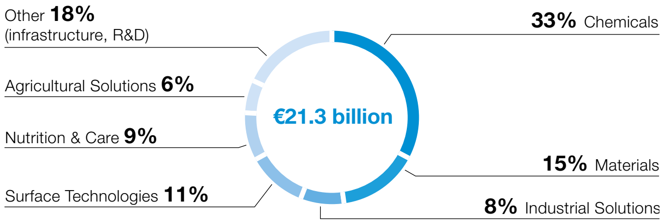
We are planning total capital expenditures (additions to property, plant and equipment excluding acquisitions, IT investments, restoration obligations and right-of-use assets arising from leases) of around €3.8 billion for the BASF Group in 2019. For the period from 2019 to 2023, we have planned capital expenditures totaling €21.3 billion. The investment volume in the coming years thus exceeds that of the planning period 2018 to 2022. Projects currently being planned or underway include:

Capex: selected projects

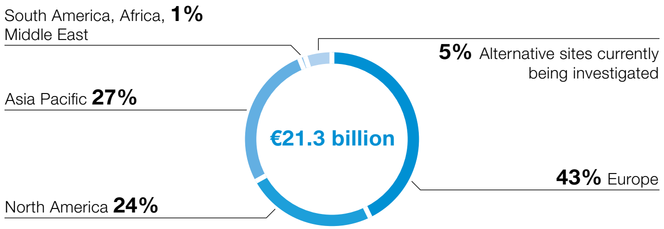
Location	Project
Antwerp, Belgium	Capacity expansion: integrated ethylene oxide complex
Geismar, Louisiana	Capacity expansion: MDI plant
Ludwigshafen, Germany	Replacement: acetylene plant
	Construction: production plant for vitamin A
	Construction: production plant for ibuprofen
Kuantan, Malaysia	Capacity expansion: acrylic acid and butyl acrylate
Mundra, India	Investment: acrylics value chain[1]
Zhanjiang, China	Establishment of an integrated Verbund site

1 In cooperation with Adani Group

Capex by segment 2019–2023



Capex by region 2019–2023



Dividend

We stand by our ambitious dividend policy and offer our shareholders an attractive dividend yield. We aim to increase our dividend each year.

Information on the proposed dividend can be found on page 13

Financing

In 2019, we expect cash outflows in the equivalent amount of around €2.0 billion from the scheduled repayment of bonds. To refinance maturing bonds and to optimize our maturity profile, we continue to have medium to long-term corporate bonds and our U.S. dollar commercial paper program at our disposal.

Information on our financing policies can be found on page 54

Events after the reporting period

On January 31, 2019, BASF and Solenis completed the transfer of BASF's paper and water chemicals business to Solenis as announced in May 2018.

The business was allocated to the Performance Chemicals division until this date. As of February 1, 2019, we hold a 49% share in Solenis. The transaction includes production sites and plants of BASF's paper and water chemicals business in Bradford and Grimsby, U.K.; Suffolk, Virginia; Altamira, Mexico; Ankleshwar, India; and Kwinana, Australia. Since closing, we have accounted for our share in Solenis' income after taxes using the equity method due to our significant influence, and included this in EBIT of the BASF Group, presented in Other.

Opportunities and Risks

The goal of BASF's risk management is to identify and evaluate opportunities and risks as early as possible and to take appropriate measures in order to seize opportunities and limit business losses. The aim is to avoid risks that pose a threat to BASF's continued existence and to make improved managerial decisions to create value. We define opportunities as potential successes that exceed our defined goals. We understand risk to be any event that can negatively impact the achievement of our short-term operational or long-term strategic goals.

Opportunities

Potential successes that exceed our defined goals

Risks

Events that can negatively impact the achievement of our goals

In order to effectively measure and manage identified opportunities and risks, we quantify these where appropriate in terms of probability and economic impact in the event they occur. Where possible, we use statistical methods to aggregate opportunities and risks into risk factors. This way, we achieve an overall view of opportunities and risks at a portfolio level, allowing us to take effective measures for risk management.

Overall assessment

- **Significant opportunities and risks arise from overall economic developments and margin volatility**
- **No threat to continued existence of BASF**

For 2019, we expect the global economy to continue to grow at a slightly slower pace than in the previous year. Important opportunities and risks for our earnings are associated with uncertainty regarding market growth and the development of key customer industries, as well as margin volatility. In particular, a further escalation of the trade conflicts between the United States and its trade partners and a considerable slowdown of the Chinese economy pose significant risks. Such a development would negatively affect demand for intermediate and investment goods. This would impact the emerging markets that export raw materials as well as the advanced economies. This is especially true for Europe. Further risks to the global economy arise from an escalation of geopolitical conflicts.

According to our assessment, there continue to be no significant individual risks that pose a threat to the continued existence of the BASF Group. The same applies to the sum of individual risks, even in the case of another global economic crisis.

Ultimately, however, residual risks remain in all entrepreneurial activities that cannot be ruled out, even by comprehensive risk management.

Potential short-term effects on EBIT of key opportunity and risk factors subsequent to measures taken[1]

Possible variations related to:	Outlook – 2019 (–)	Outlook 2019 (+)
Business environment and sector		
Market growth	■■■■■	■■■□□
Margins	□■■■■	■■■■□
Competition	□□■■■	■■□□□
Regulation/policy	□□□■■	■□□□□
Company-specific opportunities and risks		
Purchasing/supply chain	□□□■■	■□□□□
Investments/production	□□□■■	■□□□□
Personnel	□□□□■	■□□□□
Acquisitions/divestitures/cooperations	□□□■■	■■□□□
Information technology	□□□□■	□□□□□
Law	□□□■■	■□□□□
Financial		
Exchange rate volatility	□□■■■	■■■□□
Other financial opportunities and risks	□□□■■	■□□□□

□□□□■	< €100 million	
□□□■■	≥ €100 million	< €500 million
□□■■■	≥ €500 million	< €1,000 million
□■■■■	≥ €1,000 million	< €1,500 million
■■■■■	≥ €1,500 million	≤ €2,000 million

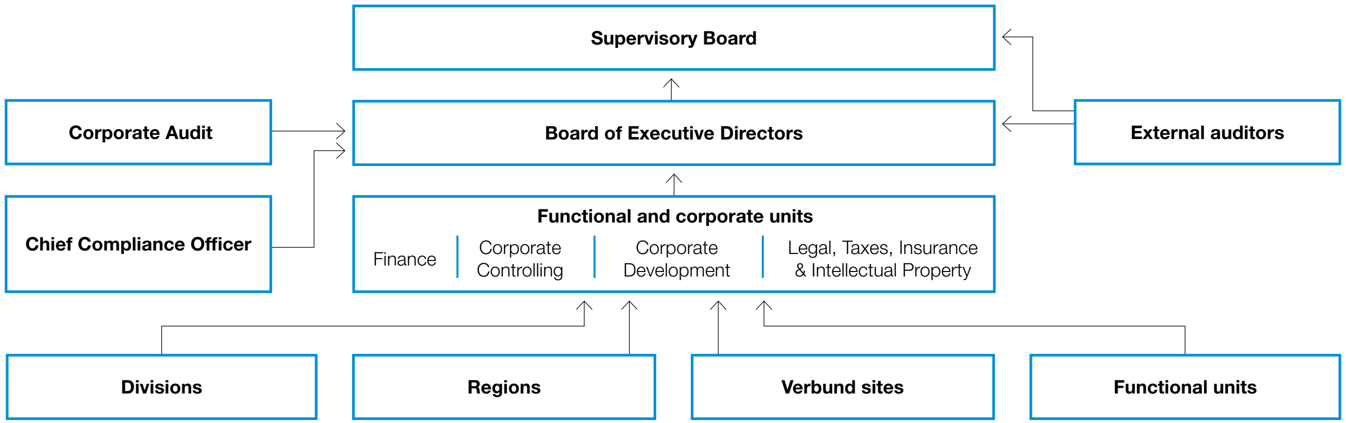
1 Using a 95% confidence interval per risk factor based on planned values; summation is not permissible.

Risk management process

- **Integrated process for identification, assessment and reporting**
- **Decentralized management of specific opportunities and risks**
- **Aggregation at a Group level**

The BASF Group's risk management process is based on the international risk management standard COSO II Enterprise Risk Management – Integrated Framework (2004), and has the following key features:

Organization of BASF Group's risk management



Organization and responsibilities

- Risk management is the responsibility of the Board of Executive Directors, which also determines the processes for approving investments, acquisitions and divestitures.
- The Board of Executive Directors is supported by the units Finance, Corporate Controlling, Corporate Development and Legal, Taxes, Insurance & Intellectual Property, and the Chief Compliance Officer. These units coordinate the risk management process at a Group level and provide the structure and appropriate methodology. Opportunity and risk management is thus integrated into the strategy, planning and budgeting processes.
- A network of risk managers in the business, functional and corporate units as well as in the regions and at the Verbund sites advances the implementation of appropriate risk management practices in daily operations.
- The management of specific opportunities and risks is largely delegated to the business units and is steered at a regional or local level. Risks relating to exchange rates and raw materials prices are an exception. In this case, there is an initial consolidation at a Group level before derivative hedging instruments, for example, are used.
- BASF's Chief Compliance Officer (CCO) manages the implementation of our Compliance Management System, supported by additional compliance officers worldwide. He regularly reports to the Board of Executive Directors on the status of implementation as well as on any significant results. He also provides a status report to the Supervisory Board's Audit Committee at least once a year, including any major developments. In the event of significant incidents, the Audit Committee is immediately informed by the Board of Executive Directors.
- The internal auditing unit (Corporate Audit) is responsible for regularly auditing the risk management system established by the Board of Executive Directors in accordance with section 91(2) of the German Stock Corporation Act. Furthermore, as part of its monitoring of the Board of Executive Directors, the Supervisory Board considers the effectiveness of the risk management system. The suitability of the early detection system we set up for risks is evaluated by our external auditor.

Instruments

- The Risk Management Policy, applicable throughout the Group, forms the framework for risk management and is implemented by the business units according to their particular business conditions.
- A catalog of opportunity and risk categories helps to identify all relevant opportunities and risks as comprehensively as possible.
- We use standardized evaluation and reporting tools for the identification and assessment of risks. The aggregation of opportunities, risks and sensitivities at division and Group level using a Monte Carlo simulation helps us to identify effects and trends across the Group.
- The nonfinancial topics relevant for BASF are addressed by the responsible functional units, which assess the risks identified as being relevant according to impact and probability of occurrence. We identify opportunities and risks that arise in connection with the topics of environment, society and governance with our sustainability management tools. We have established global monitoring systems to check adherence to laws and our voluntary commitments in these areas. These also incorporate our suppliers.

For more information on our sustainability management processes, see page 36 onward

- The BASF Group's management is informed about operational opportunities and risks (observation period of up to one year) in the monthly management report produced by the Corporate Controlling unit. In addition, Corporate Controlling and Finance provide information twice a year on the aggregated opportunity/risk exposure of the BASF Group. Furthermore, if a new individual risk is identified which has a more than €10 million impact on earnings or bears reputational risks, it must be immediately reported.
- As part of strategy development in the strategic business units, the Corporate Development unit conducts strategic opportunity/risk analyses with a 10-year assessment period. These analyses are annually reviewed as part of strategic controlling and are adapted if necessary.
- Our Group-wide Compliance Program aims to ensure adherence to legal regulations and the company's internal guidelines. Our global employee Code of Conduct firmly embeds these mandatory standards into everyday business. Members of the Board of Executive Directors are also expressly obligated to follow these principles.

For more information on our Group-wide Compliance Program, see page 140 onward

Significant features of the internal control and risk management system with regard to the Group financial reporting process

- **Conducted in accordance with standardized Group guidelines**
- **Segregation of duties, principle of dual control and clearly regulated access rights**
- **Annual evaluation of the control environment and relevant processes at significant companies**

The Consolidated Financial Statements are prepared by a unit in the Finance division. BASF Group's accounting process is based on a uniform accounting guideline that sets out accounting policies and the significant processes and deadlines on a Group-wide basis. There are binding directives for the internal reconciliations and other accounting operations within the Group. Standard software is used to carry out the accounting processes for the preparation of the individual financial statements as well as for the Consolidated Financial Statements. There are clear rules for the access rights of each participant in these processes.

Employees involved in the accounting and reporting process meet the qualitative requirements and participate in training on a regular basis. There is a clear assignment of responsibilities between the specialist units, companies and regional service units involved. We strictly adhere to the principles of segregation of duties and dual control, or the "four-eyes principle." Complex actuarial reports and evaluations are produced by specialized service providers or specially qualified employees.

An internal control system for financial reporting continuously monitors these principles. To this end, methods are provided to ensure that evaluation of the internal control system in financial reporting is structured and uniform across the BASF Group.

The significant risks for the BASF Group regarding a reliable control environment for proper financial reporting are reviewed and updated on an annual basis. Risks are compiled into a central risk catalog.

Moreover, a centralized selection process identifies companies that are exposed to particular risks, that are material to the Consolidated Financial Statements of the BASF Group, or that provide service processes. The selection process is conducted annually. In the relevant companies, one person is given the responsibility of monitoring the execution of the requirements for an effective control system in financial reporting.

In these companies, the process comprises the following steps:

- **Evaluation of the control environment**
  Adherence to internal and external guidelines that are relevant for the maintenance of a reliable control environment is checked by means of a standardized questionnaire.
- **Identification and documentation of control activities**
  In order to mitigate the risks to the financial reporting processes listed in our central risk catalog, critical processes and control activities are documented.
- **Assessment of control activities**
  After documentation, a review is performed to verify whether the described controls are capable of adequately covering the risks. In the subsequent test phase, samples are taken to test whether, in practice, the controls were executed as described and effective.
- **Monitoring of control weaknesses**
  The managers responsible receive reports on any control weaknesses identified and their resolution, and an interdisciplinary committee investigates their relevance for the BASF Group. The Board of Executive Directors and the Audit Committee are informed once control weaknesses have been identified that have a considerable impact on financial reporting. Only after material control weaknesses have been resolved does the company's managing director confirm the effectiveness of the internal control system.
- **Internal confirmation of the internal control system**
  All managing directors and chief financial officers of each consolidated Group company must confirm to the Board of Executive Directors of BASF SE every half-year and at the end of the annual cycle, in writing, that the internal control system is effective with regard to accounting and reporting.

Short-term opportunities and risks

Development of demand

The development of our sales markets is one of the strongest sources of opportunities and risks. More details on our assumptions regarding short-term growth rates for the global economy, regions and key customer industries, such as the chemicals, automotive and construction sectors, can be found under Economic Environment in 2019 on pages 117 to 119.

We also consider risks from deviations in assumptions. We continue to see a significant macroeconomic risk in a further escalation of the trade conflicts between the United States and its trade partners and an increased slowdown of the Chinese economy, which would have considerable impact on demand for intermediate goods for industrial production as well as investment goods. This would have an effect on emerging markets that export raw materials as well as on advanced economies that specialize in technological goods. Risks to the global economy would also be posed by the possible escalation of geopolitical conflicts.

Should the macroeconomic environment develop more slowly than we predict, we expect a lower oil price. In this case, we also expect the euro to weaken relative to the U.S. dollar in the medium term as compared with our planning assumptions, as the eurozone's economy shows a high level of dependency on exports and, in times of global economic weakness, the U.S. dollar is preferred by portfolio investors as a safe haven.

Weather-related influences can result in positive or negative effects, especially on our crop protection business.

Margin volatility

Margin risks for the BASF Group result on the one hand from a further decline in margins in the Chemicals segment or the isocyanates business. New capacities or raw materials shortages could also increase margin pressure on a number of products and value chains. This would have a negative effect on our EBIT. In addition, the contribution attributable to BASF from the agreed combination of BASF's and LetterOne's oil and gas businesses will only be included in EBIT again on closing of the transaction. This would have a compensating effect on margin pressure in the chemicals business if oil and gas prices rise. The year's average oil price for Brent crude was around $71 per barrel in 2018, compared with $54 per barrel in the previous year. For 2019, we anticipate an average oil price of $70 per barrel. We therefore expect price levels for the raw materials and petrochemical basic products that are important to our business to remain constant or decrease slightly.

Competition

We continuously enhance our products and solutions in order to maintain competitive ability. We watch the market and the competition, and try to take targeted advantage of opportunities and counter emerging risks with suitable measures. Aside from innovation, key components of our competitiveness are our ongoing cost management and our continuous process optimization.

Regulation and political risks

Risks for us can arise from intensified geopolitical tensions, new trade sanctions, stricter emissions limits for plants or energy and climate laws. In addition, risks to the BASF Group can be posed by further regulations in key customer industries or on the use or registration of agricultural and other chemicals.

Economic and political uncertainties may arise as a result of Brexit. At this point in time, it is not yet clear what the future relationship between the European Union and the United Kingdom will look like post-Brexit and what specific consequences this will have for our sites, our supply chains and the regulatory environment. A cross-divisional Brexit team has been established to prepare the BASF organization for various exit scenarios and enable it to promptly react to political decisions. Together with our operating units, suppliers, customers and logistics partners, we have identified problems and steps to avoid supply chain disruptions, especially in the event of a no-deal hard Brexit with no transition phase. Alternative logistics concepts include, for example, leasing additional warehouse space, establishing consignment warehouses or technical expansions in our ERP systems to be able to react to additional customs requirements on the systems side as well.

Political measures could also give rise to opportunities. For example, we view the worldwide expansion of renewable energy and measures to increase energy efficiency as an opportunity for increased demand for our products, such as our insulation foams for buildings or our solutions for wind turbines. Our broad product portfolio enables us to offer alternatives if chemicals have to be substituted as a result of restrictions in connection with the REACH chemicals regulation or new standards in our customers' industries.

Purchasing and supply chain

We minimize procurement risks through our broad portfolio, global purchasing activities and the purchase of raw materials on spot markets. If possible, we avoid procuring raw materials from a single supplier. When this cannot be avoided, we try to foster competition or we knowingly enter into this relationship and assess the consequences of potential nondelivery. We continuously monitor the credit risk of important business partners. We address the risk of supply interruptions on the procurement and sales side as a result of extreme weather conditions (such as high/low water levels on rivers, hurricanes) by switching to unaffected logistics carriers and the possibility of falling back on unaffected sites within our global Verbund.

Production and investments

We try to prevent unscheduled plant shutdowns by adhering to high technical standards and by continuously improving our plants. We reduce the effects of unscheduled shutdowns on the supply of intermediate and end products through diversification within our global production Verbund.

In the event of a production outage – caused by an accident, for example – our global, regional or local emergency response plans and crisis management structures are engaged, depending on the impact scope. Every region has crisis management teams on a local and regional level. They not only coordinate the necessary emergency response measures, they also initiate the immediate measures for damage control and resumption of normal operations as quickly as possible.

Short-term risks from investments can result from, for example, technical malfunctions or schedule and budget breaches. We counter these risks with highly experienced project management and controlling.

For more information on emergency response, see page 98 onward and basf.com/emergency_response

Acquisitions, divestitures and cooperations

We are constantly watching our environment in order to identify possible targets and develop our portfolio appropriately. In addition, we work together in collaborations with customers and partners to jointly develop new, competitive products and applications.

Opportunities and risks arise in connection with acquisitions and divestitures from the conclusion of a transaction, or it being completed earlier or later than expected. They relate to the regular earnings contributions gained or lost as well as the realization of gains or losses from divestitures if these deviate from our planning assumptions. In the case of transactions involving the contribution of businesses to an investment accounted for using the equity method, a risk of impairment of these investments can arise. The extent of this risk depends on factors such as the amount of hidden reserves uncovered within the scope of initial measurement of the investment accounted for using the equity method.

Personnel

Due to BASF's worldwide compensation principles, the development of personnel expenses is partly dependent on the amount of variable compensation, which is linked to the company's success, among other factors. The correlation between variable compensation and the success of the company has the effect of minimizing risk. Another factor is the development of interest rates for discounting pension obligations. Furthermore, changes to the legal environment of a particular country can have an impact on the development of personnel expenses for the BASF Group. For countries in which BASF is active, relevant developments are therefore constantly monitored in order to recognize risks at an early stage and enable BASF to carry out suitable measures.

For more information on our compensation system, see page 114
For more information on risks from pension obligations, see page 129

Information technology risks

BASF relies on a large number of IT systems. Their nonavailability, violation of confidentiality or the manipulation of data in critical IT systems and applications can all have a direct impact on production and logistics processes. The threat environment has changed in recent years, as attackers have become better organized, use more sophisticated technology, and have far more resources available. If data are lost or manipulated, this can, for example, negatively affect process safety and the accuracy of our financial reporting. Unauthorized access to sensitive data, such as personnel records, competition-related information or research results, can result in legal consequences or jeopardize our competitive position. This would also be accompanied by the associated loss of reputation.

To minimize such risks, BASF uses globally uniform processes and systems to ensure IT security, such as stable and redundantly designed IT systems, backup processes, virus and access protection, encryption systems as well as integrated, Group-wide standardized IT infrastructure and applications. The systems used for information security are constantly tested, continuously updated, and expanded if necessary. In addition, our employees receive regular training on information and data protection. IT-related risk management is conducted using Group-wide regulations for organization and application, as well as an internal control system based on these regulations. BASF also established the Cyber Defense Center in 2015, is a member of Cyber Security Sharing and Analytics e.V. (CSSA) and a founding member of the German Cybersecurity Organization (DCSO) together with Allianz SE, Bayer AG and Volkswagen AG.

Legal disputes and proceedings

We constantly monitor current and potential legal disputes and proceedings, and regularly report on these to the Board of Executive Directors and Supervisory Board. In order to assess the risks from current legal disputes and proceedings and any potential need to recognize provisions, we prepare our own analyses and assessments of the circumstances and claims considered. In addition, in individual cases, we consider the results of comparable proceedings and, if needed, independent legal opinions. Risk assessment is particularly based on estimates as to the probability of occurrence and the range of possible claims. These estimates are the result of close cooperation between the relevant operating and functional units together with the Legal and Finance units. If sufficient probability of occurrence is identified, a provision is recognized accordingly for each proceeding. Should a provision be unnecessary, general risk management continues to assess whether these litigations nevertheless give rise to a risk for the EBIT of the BASF Group.

We use our internal control system to limit risks from potential infringements of rights or laws. For example, we try to avoid patent and licensing disputes whenever possible through extensive clearance research. As part of our Group-wide Compliance Program, our employees receive regular training.

Financial opportunities and risks

The management of liquidity, currency and interest rate risks is conducted in the Treasury unit. The management of commodity price risks takes place in the Procurement & Supply Chain Services functional unit or in appropriately authorized Group companies. Detailed guidelines and procedures exist for dealing with financial risks. Among other things, they provide for the segregation of trading and back office functions.

As a part of risk management, activities in countries with transfer restrictions are continuously monitored. This includes, for example, regular analysis of the macroeconomic and legal environment, shareholders' equity and the business models of the operating units. The chief aim is the reduction of counterparty, transfer and currency risks for the BASF Group.

Exchange rate volatility

Our competitiveness on global markets is influenced by fluctuations in exchange rates. For BASF's sales, opportunities and risks arise in particular when the U.S. dollar exchange rate fluctuates. A full-year appreciation of the U.S. dollar against the euro by $0.01 would result in an increase of around €45 million in the BASF Group's EBIT, assuming other conditions remain the same. On the production side, we counter exchange rate risks by producing in the respective currency zones.

Financial currency risks result from the translation of receivables, liabilities and other monetary items in accordance with IAS 21 at the closing rate into the functional currency of the respective Group company. In addition, we incorporate planned purchase and sales transactions in foreign currencies in our financial foreign currency risk management. These risks are hedged using derivative instruments, if necessary.

Interest rate risks

Interest rate risks result from potential changes in prevailing market interest rates. These can cause a change in the fair value of fixed-rate instruments and fluctuations in the interest payments for variable-rate financial instruments, which would positively or negatively affect earnings. To hedge these risks, interest rate swaps and combined interest rate and currency derivatives are used in individual cases.

In addition to market interest rates, BASF's financing costs are determined by the credit risk premiums to be paid. These are mainly influenced by our credit rating and the market conditions at the time of issue. In the short to medium term, BASF is largely protected from the possible effects on its interest result thanks to the balanced maturity profile of its financial indebtedness.

Risks from metal and raw materials trading

In the catalysts business, BASF employs commodity derivatives for precious metals and trades precious metals on behalf of third parties and on its own account. Appropriate commodity derivatives are also traded to optimize BASF's supply of refinery products, gas and other petrochemical raw materials. To address specific risks associated with these trades, we set and continuously monitor limits with regard to the type and scope of the deals concluded.

Liquidity risks

Risks from fluctuating cash flows are recognized in a timely manner as part of our liquidity planning. We have access to extensive liquidity at any time thanks to our good ratings, our unrestricted access to the commercial paper market and committed bank credit lines. In the short to medium term, BASF is largely protected against potential refinancing risks by the balanced maturity profile of its financial indebtedness as well as through diversification in various financial markets.

For more information on the maturity profile of our financial indebtedness, see the explanations in the Financial Position on page 54 and the Notes to the Consolidated Financial Statements from page 246 onward

Risk of asset losses

We limit country-specific risks with measures based on internally determined country ratings, which are continuously updated to reflect changing environment conditions. We selectively use investment guarantees to limit specific country-related risks. We lower credit risks for our financial investments by engaging in transactions only with banks with good credit ratings and by adhering to fixed limits. Creditworthiness is continuously monitored and the limits are adjusted accordingly. We reduce the risk of default on receivables by continuously monitoring the creditworthiness and payment behavior of our customers and by setting appropriate credit limits. Due to the global activities and diversified customer structure of the BASF Group, there are no major concentrations of credit default risk. Risks are also limited through the use of credit insurance and bank guarantees.

Impairment risks

Asset impairment risks arise if the assumed interest rate in an impairment test increases, the predicted cash flows decline, or investment projects are suspended. In the current business environment, we consider impairment risks for individual assets such as customer relationships, technologies and trademarks, as well as goodwill, to be nonmaterial.

Long-term incentive program for senior executives

Our senior executives have the opportunity to participate in a share price-based compensation program. The need for provisions for this program varies according to the development of the BASF share price and the MSCI World Chemicals Index; this leads to a corresponding increase or decrease in personnel costs.

For more information on the long-term incentive program, see the Notes to the Consolidated Financial Statements from page 263 onward

Risks from pension obligations

Most employees are granted company pension benefits from either defined contribution or defined benefit plans. We predominantly finance company pension obligations externally through separate plan assets. This particularly includes BASF Pensionskasse VVaG and BASF Pensionstreuhand e.V. in Germany, in addition to the large pension plans of our Group companies in North America, the United Kingdom and Switzerland. To address the risk of underfunding due to market-related fluctuations in plan assets, we have investment strategies that align return and risk optimization to the structure of the pension obligations. Stress scenarios are also simulated regularly by means of portfolio analyses. An adjustment to the interest rates used in discounting pension obligations leads immediately to changes in equity. To limit the risks of changing financial market conditions as well as demographic developments, employees have, for a number of years now, been almost exclusively offered defined contribution plans for future years of service. Some of these contribution plans include minimum interest guarantees. If the pension fund cannot generate this, it must be provided by the employer. A permanent continuation of the low interest rate environment could make it necessary to recognize pension obligations and plan assets for these plans as well.

Long-term opportunities and risks

Long-term demand development

We assume that chemical production (excluding pharmaceuticals) will grow slightly faster than global gross domestic product over the next five years and be slightly below the previous five-year average. Through our market-oriented and broad portfolio, which we will continue to strengthen in the years ahead through investments in new production capacities, research and development activities and acquisitions, we aim to achieve volumes growth that exceeds this market growth. Should global economic growth see unexpected, considerable deceleration, due for example to an ongoing weak period in the emerging markets, protectionist tendencies or to geopolitical crises, the expected growth rates could prove too ambitious. As a result of our high degree of diversification across various customer industries and regions, we would still expect our growth to be above the market average, even under these conditions.

For more information on the corporate strategy, see page 25 onward

Development of competitive and customer landscape

We expect competitors from Asia and the Middle East in particular to gain increasing significance in the years ahead. Furthermore, we predict that many producers in countries rich in raw materials will expand their value chains. We counter this risk through active portfolio management. We exit markets in which we see only limited possibilities to stand out from competitors in the long term.

We continuously improve our processes in order to remain competitive through our operational excellence. Our strategic excellence program, which will run from 2019 to 2021, also contributes to this aim. The program will include measures focused on production, logistics, research and development as well as digitalization and automation activities and organizational development. We expect this program to contribute around €2 billion in income each year from 2021 onward.

In order to achieve lasting profitable growth, tap into new market segments and customers, and make our customers more successful, our research and business focus is on highly innovative business areas, some of which we enter into through strategic cooperative partnerships.

Innovation

The trend toward increased sustainability requirements in our customer industries continues. Our aim is to leverage the resulting opportunities in a growing market even more effectively in the future with more sustainable innovations. This is why we applied the Sustainable Solution Steering method, which is used to evaluate the sustainability of our product portfolio, to assessments of innovation projects, and integrated it into an early stage of our research and development processes as well as the development of our business strategies. In this way, we want to benefit from the higher profitability of our Accelerator solutions compared with the rest of our evaluated portfolio. At the same time, as of 2018, we reduce reputational and financial risks by phasing out products for which we have identified substantial sustainability concerns ("Challenged" products) within five years of initial classification as such at the latest. We must develop action plans for these products at an early stage to minimize any potential financial risks. These can include research projects, reformulations or even replacing one product with another.

The central research areas Process Research & Chemical Engineering, Advanced Materials & Systems Research and Bioscience Research serve as global platforms headquartered in our key regions: Europe, Asia Pacific and North America. Together with the development units in our operating divisions, they form the core of the global Know-How Verbund. Our strong regional presence opens up opportunities to participate in local innovation processes and gain access to local talent. We optimize the effectiveness and efficiency of our research activities through our global Know-How Verbund.

Research activities funded by the BASF Group promote the targeted development and enhancement of key technologies as well as the establishment of new business areas. Focus areas in research are determined based on their strategic relevance for BASF, above and beyond existing business areas. We also address the risk of the technical or economic failure of research and development projects by maintaining a balanced and comprehensive project portfolio, as well as through professional, milestone-based project management.

Potential applications of digital technologies and solutions along the entire value chain are investigated in both the operational and functional divisions as well as by cross-divisional teams, and tested in dedicated pilot projects. They are supported here by the Digitalization & Information Services unit. We analyze the opportunities and risks of digitalization in Production, Logistics, Research & Development and for business models as well as in corporate functions such as Finance, Human Resources, Procurement & Supply Chain Services, Legal, Taxes, Insurance & Intellectual Property. The opportunities and risks of digitalization are steered by the operational and functional divisions.

The trust of customers and consumers is essential for the successful introduction of new technologies. That is why we enter into dialog with our stakeholders at an early stage of development.

For more information on portfolio management using the Sustainable Solution Steering method, see page 37 onward
For more information on innovation and digitalization, see page 31 onward

Portfolio development through investments

Our decisions on the type, scope and locations of our investment projects are based on assumptions related to the long-term development of markets, margins and costs, as well as raw material availability and country, currency and technology risks. Opportunities and risks arise from potential deviations in actual developments from our assumptions.

We expect the increase in chemical production in emerging markets in the coming years to remain above the global average. This will create opportunities that we want to exploit by expanding our local presence.

We are continuing to evaluate an investment in a world-scale methane-to-propylene complex on the U.S. Gulf Coast and conduct regular assessments, taking into account raw materials prices and the relevant market conditions.

For more information on our investment plans, see page 122

Acquisitions

In the future, we will continue to refine our portfolio through acquisitions that promise above-average profitable growth as part of the BASF Verbund and help to reach a relevant market position. We also take into account whether they are innovation-driven or offer a technological differentiation, and make new, sustainable business models possible.

The evaluation of opportunities and risks plays a significant role during the assessment of acquisition targets. A detailed analysis and quantification is conducted as part of due diligence. Examples of risks include increased staff turnover, delayed realization of synergies, or the assumption of obligations that were not precisely quantifiable in advance. If our expectations in this regard are not fulfilled, risks could arise, such as the need to impair intangible assets; however, there could also be opportunities, for example, from additional synergies.

Recruitment and long-term retention of qualified employees

BASF anticipates growing challenges in attracting qualified employees in the medium and long term due to demographic change, especially in North America and Europe. As a result, there is an increased risk that job vacancies may not be filled with suitable applicants, or only after a delay. We address these risks with measures to integrate diversity, employee and leadership development, and intensified employer branding. At local level, demographic management includes succession planning, knowledge management and offerings to improve the balance between personal and professional life and promote healthy living. This increases BASF's appeal as an employer and retains our employees in the long term.

For more information on the individual initiatives and our goals, see page 110 onward

Sustainability

As part of our sustainability management, we also assess the opportunities and risks associated with the topics we have identified as material. These also include the increasing internalization of external effects, through which positive and negative earnings contributions from companies' activities that were previously borne by the community are attributed to these companies.

For example, the material topic "energy and climate" is analyzed to enable us to identify, assess and manage climate-related risks and opportunities. For BASF as an energy-intensive company, these arise particularly from regulatory changes, such as in carbon prices through emissions trading systems, taxes or energy legislation.

For more information on sustainability management, see page 36 onward
For more information on energy and climate protection, see page 103 onward
For more information on opportunities and risks from energy policies, see page 126