

CONSOLIDATED FINANCIAL STATEMENTS

CONSOLIDATED FINANCIAL STATEMENTS OF COVESTRO AG AS OF DECEMBER 31, 2019

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COVESTRO GROUP CONSOLIDATED INCOME STATEMENT

	Note	2018 ¹	2019
		€ million	€ million
Sales	6	14,616	12,412
Cost of goods sold		(9,918)	(9,658)
Gross profit		4,698	2,754
Selling expenses		(1,408)	(1,380)
Research and development expenses		(276)	(266)
General administration expenses		(491)	(372)
Other operating income	7	123	181
Other operating expenses	8	(66)	(65)
EBIT²		2,580	852
Equity-method loss		(22)	(22)
Result from other affiliated companies		1	2
Interest income		35	40
Interest expense		(82)	(85)
Other financial result		(36)	(26)
Financial result	10	(104)	(91)
Income before income taxes		2,476	761
Income taxes	11	(647)	(204)
Income after income taxes		1,829	557
of which attributable to noncontrolling interest		6	5
of which attributable to Covestro AG stockholders (net income)		1,823	552
		€	€
Basic earnings per share³	12	9.46	3.02
Diluted earnings per share³	12	9.46	3.02

¹ Reference information was not restated, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

² EBIT: income after income taxes plus financial result and income taxes

³ Weighted average number of outstanding no-par voting shares of Covestro AG in issue: 182,728,724 (previous year: 192,768,826)

COVESTRO GROUP CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

	Note	2018 ¹	2019
		€ million	€ million
Income after income taxes		1,829	557
Remeasurements to the net defined benefit liability for post-employment benefit plans	20	(198)	(439)
Income taxes	11	45	103
Other comprehensive income from remeasurements of the net defined benefit liability for post-employment benefit plans		(153)	(336)
Changes in fair values of equity instruments	24	1	–
Income taxes	11	–	–
Other comprehensive income from equity instruments		1	–
Other comprehensive income that will not be reclassified subsequently to profit or loss		(152)	(336)
Exchange differences of foreign operations		72	93
Reclassified to profit or loss		–	–
Other comprehensive income from exchange differences		72	93
Other comprehensive income that may be reclassified subsequently to profit or loss		72	93
Total other comprehensive income²		(80)	(243)
of which attributable to noncontrolling interest		2	1
of which attributable to Covestro AG stockholders		(82)	(244)
Total comprehensive income		1,749	314
of which attributable to noncontrolling interest		8	6
of which attributable to Covestro AG stockholders		1,741	308

¹ Reference information has not been restated, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

² Total change recognized outside profit or loss

COVESTRO GROUP CONSOLIDATED STATEMENT OF FINANCIAL POSITION

	Note	Dec. 31, 2018 ¹	Dec. 31, 2019
		€ million	€ million
Noncurrent assets			
Goodwill	13	256	264
Other intangible assets	13	77	114
Property, plant and equipment ²	14	4,409	5,286
Investments accounted for using the equity method	15	214	192
Other financial assets	16	31	32
Other receivables	18	32	52
Deferred taxes	11	782	851
		5,801	6,791
Current assets			
Inventories	17	2,213	1,916
Trade accounts receivable		1,786	1,561
Other financial assets	16	17	27
Other receivables	18	346	359
Claims for income tax refunds		55	104
Cash and cash equivalents		865	748
Assets held for sale		1	12
		5,283	4,727
Total assets		11,084	11,518
Equity	19		
Capital stock of Covestro AG		183	183
Capital reserves of Covestro AG		3,480	3,487
Other reserves		1,679	1,537
Equity attributable to Covestro AG stockholders		5,342	5,207
Equity attributable to noncontrolling interest		33	47
		5,375	5,254
Noncurrent liabilities			
Provisions for pensions and other post-employment benefits	20	1,445	1,965
Other provisions	21	237	230
Financial liabilities ²	22	1,166	1,601
Income tax liabilities	11	107	95
Other liabilities	23	18	32
Deferred taxes	11	153	206
		3,126	4,129
Current liabilities			
Other provisions	21	493	203
Financial liabilities ²	22	59	151
Trade accounts payable		1,637	1,507
Income tax liabilities	11	172	69
Other liabilities	23	222	191
Liabilities directly related to assets held for sale		–	14
		2,583	2,135
Total equity and liabilities		11,084	11,518

¹ Reference information has not been restated, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

² The figures as of December 31, 2019, include right-of-use assets and lease liabilities from initial application of IFRS 16.

COVESTRO GROUP CONSOLIDATED STATEMENT OF CASH FLOWS

	Note	2018 ¹	2019
		€ million	€ million
Income after income taxes		1,829	557
Income taxes		647	204
Financial result		104	91
Income taxes paid		(574)	(296)
Depreciation, amortization, impairment losses and impairment loss reversals		620	752
Change in pension provisions		26	49
(Gains)/losses on retirements of noncurrent assets		(45)	(51)
Decrease/(increase) in inventories		(308)	322
Decrease/(increase) in trade accounts receivable		110	238
(Decrease)/increase in trade accounts payable		31	(149)
Change in other working capital, other noncash items		(64)	(334)
Cash flows from operating activities	27.1	2,376	1,383
Cash outflows for additions to property, plant, equipment and intangible assets		(707)	(910)
Cash inflows from sales of property, plant, equipment and other assets		23	6
Cash inflows from divestitures		66	51
Cash outflows for noncurrent financial assets		(20)	(15)
Cash inflows from noncurrent financial assets		1	2
Cash outflows for acquisitions less acquired cash		–	(11)
Interest and dividends received		32	40
Cash inflows from/(outflows for) other current financial assets		259	(1)
Cash flows from investing activities	27.2	(346)	(838)
Reacquisition of treasury shares		(1,313)	–
Reissuance of treasury shares		8	7
Dividend payments and withholding tax on dividends		(441)	(442)
Issuances of debt		64	444
Retirements of debt ²		(646)	(591)
Interest paid ²		(74)	(86)
Cash flows from financing activities	27.3	(2,402)	(668)
Change in cash and cash equivalents due to business activities		(372)	(123)
Cash and cash equivalents at beginning of year		1,232	865
Change in cash and cash equivalents due to changes in scope of consolidation		–	(1)
Change in cash and cash equivalents due to exchange rate movements		5	7
Cash and cash equivalents at end of year		865	748

¹ Reference information was not restated, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

² The figures as of December 31, 2019, include the effects from initial application of IFRS 16, see note 27.3 "Cash flows from financing activities."

COVESTRO GROUP CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

	Capital stock of Covestro AG	Capital reserves of Covestro AG	Retained earnings incl. total income	Accumulated other com- prehensive income	Equity attributable to Covestro AG stockholders	Equity attributable to noncontrolling interest	Equity
	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Dec. 31, 2017¹	201	4,767	113	254	5,335	30	5,365
Changes in accounting for initial application of new IFRS			8	(1)	7		7
Jan. 1, 2018 adjusted	201	4,767	121	253	5,342	30	5,372
Reacquisition and redemption of treasury shares	(18)	(1,295)			(1,313)		(1,313)
Issuance of treasury shares		8			8		8
Dividend payments			(436)		(436)	(5)	(441)
Income after income taxes			1,823		1,823	6	1,829
Other comprehensive income			(152)	70	(82)	2	(80)
Total comprehensive income			1,671	70	1,741	8	1,749
Dec. 31, 2018²	183	3,480	1,356	323	5,342	33	5,375
of which treasury shares		(15)			(15)		(15)
Dec. 31, 2018²	183	3,480	1,356	323	5,342	33	5,375
Issuance of treasury shares		7			7		7
Dividend payments			(438)		(438)	(3)	(441)
Other changes ³			(12)		(12)	11	(1)
Income after income taxes			552		552	5	557
Other comprehensive income			(336)	92	(244)	1	(243)
Total comprehensive income			216	92	308	6	314
Dec. 31, 2019	183	3,487	1,122	415	5,207	47	5,254
of which treasury shares		(7)			(7)		(7)

¹ Reference information was not restated for financial reporting standards IFRS 9 and IFRS 15.

² Reference information was not restated, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

³ Other changes result from a step acquisition of shares in April 2019 and the related equity transaction, see note 5.2 "Acquisitions and divestitures."

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS OF THE COVESTRO GROUP

Principles and Methods

1. General Information

Covestro AG (registered at the district trade register, or Amtsgericht, for Cologne, number: HRB 85281) is a stock exchange-listed corporation headquartered at Kaiser-Wilhelm-Allee 60, 51373 Leverkusen, (Covestro AG). The consolidated financial statements of Covestro AG for the period ended December 31, 2019, cover Covestro AG and its subsidiaries, joint arrangements and associated companies. They have been prepared according to the International Financial Reporting Standards (IFRSs) of the International Accounting Standards Board (IASB), London (United Kingdom), as endorsed by the European Union (EU) and in effect at the reporting date, the Interpretations (IFRICs) of the IFRS Interpretations Committee (IFRS IC) and the Interpretations published by the Standing Interpretations Committee (SIC), as well as the additional requirements of German commercial law pursuant to Section 315e (1) of the German Commercial Code (HGB) for the exempting IFRS consolidated financial statements. Reference information for the previous period has not been restated for new accounting standards, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

The declaration pertaining to the German Corporate Governance Code pursuant to Section 161 of the German Stock Corporation Act (AktG) has been issued and made available to stockholders. It is reproduced in section "Declaration on Corporate Governance" of the combined management report.

If certain items in the income statement, statement of comprehensive income, statement of financial position, statement of cash flows and statement of changes in equity of the Covestro Group are condensed for the sake of clarity, this is explained in the notes. The income statement has been prepared using the cost-of-sales method. Assets and liabilities are classified by maturity. They are classified as current if they mature within one year or within the Group's normal business cycle or are held for sale. Inventories, trade accounts receivable and payable and assets held for sale are consistently presented as current. Deferred tax assets, deferred tax liabilities and pension provisions are consistently presented as noncurrent.

The consolidated financial statements are drawn up in euros. Amounts are stated in millions of euros (€ million) except where otherwise indicated.

Exchange rates

In the reporting period, the following exchange rates were used for the major currencies of relevance from the perspective of the Covestro Group:

Closing rates for major currencies

		Closing Rates	
€1/		2018	2019
BRL	Brazil	4.44	4.52
CNY	China	7.87	7.82
HKD	Hong Kong	8.97	8.75
INR	India	79.73	80.19
JPY	Japan	125.85	121.94
MXN	Mexico	22.49	21.22
USD	United States	1.15	1.12

Average rates for major currencies

		Average Rates	
€1/		2018	2019
BRL	Brazil	4.29	4.41
CNY	China	7.81	7.74
HKD	Hong Kong	9.25	8.77
INR	India	80.64	78.82
JPY	Japan	130.40	122.01
MXN	Mexico	22.70	21.55
USD	United States	1.18	1.12

2. Effects of New Financial Reporting Standards

2.1 Financial reporting standards applied for the first time in the reporting period

IFRS Pronouncement (published on)	Title	Effective for annual periods beginning on or after
IFRS 16 (January 13, 2016)	Leases	January 1, 2019
IFRIC Interpretation 23 (June, 7, 2017)	Uncertainty over Income Tax Treatments	January 1, 2019
Amendments to IFRS 9 (October 12, 2017)	Prepayment Features with Negative Compensation	January 1, 2019
Amendments to IAS 28 (October 12, 2017)	Long-term Interests in Associates and Joint Ventures	January 1, 2019
Annual Improvements to IFRSs (December 12, 2017)	2015 – 2017 Cycle	January 1, 2019
Amendments to IAS 19 (February 7, 2018)	Plan Amendment, Curtailment or Settlement	January 1, 2019

With the exception of IFRS 16 (Leases), initial application of the standards listed in the table had little or no material impact on the presentation of the net assets, financial position, and results of operations. The impact of the initial application of IFRS 16 is outlined below.

Initial application of IFRS 16

On January 13, 2016, the IASB published IFRS 16 (Leases), a new standard for recognizing leases, which has been applied since January 1, 2019, in accordance with the transitional provisions and replaces the previous accounting provisions for leases.

While IFRS 16 basically retains the previous accounting rules for lessors, there is now only one accounting model for use by lessees. This requires a lessee to recognize a right-of-use asset and a corresponding lease liability for each lease. The right-of-use asset reflects a lessee's right to use the asset being leased. The lease liability represents the lessee's obligation to make contractual lease payments. Exemptions are available for leases with a term of 12 months or less or those with a low-value underlying asset.

IFRS 16 was applied using the modified retrospective approach for all leases in which Covestro is the lessee. For this reason, the reference figures for previous years were not adjusted. These continue to be presented in accordance with the previous accounting rules under IAS 17 (Leases) (for further details, see note 3 "Accounting Policies and Valuation Principles"). The initial application of IFRS 16 had no effect on equity as of January 1, 2019.

The transitional provisions under IFRS 16 stipulate that on the date of initial application no new assessment has to be made as to whether an existing agreement meets the definition of a lease according to IFRS 16. Rather, those arrangements previously assessed to be leases by applying IAS 17 and IFRIC 4 (Determining Whether an Arrangement Contains a Lease), up to and including December 31, 2018, can be continued. Covestro made use of this practical expedient when applying IFRS 16 for the first time.

With regard to lessees, right-of-use assets were generally recognized in the amount of the corresponding lease liabilities upon initial application of IFRS 16 at Covestro. In specific cases, the right-of-use asset was adjusted by the amount of accrued advance payments or liabilities recognized in the financial statements as of the end of fiscal 2018. Initial direct costs were not taken into account in the measurement of the right-of-use asset on the date of initial application. The corresponding lease liability was routinely measured using the incremental borrowing rate at the date of initial application. In addition, Covestro took advantage of the optional exemptions regarding the recognition of leases with a term of 12 months or less (short-term leases) and leases on low-value assets. As under the previously applicable standard IAS 17, payments for these leases continue to be recognized in profit or loss over the term using the straight-line method. Leases with a remaining term of less than 12 months at the date of application were recognized in the same way as short-term leases. Options to extend or terminate were reconsidered at initial application of IFRS 16 in the assessment of the term of the contract.

Upon initial application of IFRS 16, Covestro recognized lease liabilities for leases formerly classified as operating leases under IAS 17. These liabilities are measured as of January 1, 2019, at the present value of the remaining contractual lease payments discounted using the lessee's individual incremental borrowing rate. The weighted average of the incremental borrowing rate amounted to 3.2%.

The difference between the total of the future minimum lease payments from operating leases disclosed in the Notes to the Consolidated Financial Statements as of December 31, 2018, in accordance with IAS 17 and the lease liabilities as of January 1, 2019, recognized in accordance with IFRS 16, is in particular a result of the liabilities from former finance leases already recognized as of December 31, 2018, the effect of discounting future lease payments from operating leases, leases assessed for the first time under initial application of IFRS 16, changes in the assumptions on the contract term, and the exemptions exercised in relation to the accounting approach for short-term leases and leases for low-value assets.

The following reconciliations of the carrying amounts of right-of-use assets and lease liabilities as of January 1, 2019, to the carrying amounts as of December 31, 2019, are broken down by former finance leases recognized on the balance sheet in accordance with IAS 17 in conjunction with IFRIC 4 and former operating leases recognized for the first time through initial application of IFRS 16.

Right-of-use assets

	Former finance leases	Former operating leases	Totals
	€ million	€ million	€ million
Right-of-use assets, January 1, 2019	218	660	878
Additions	–	91	91
Retirements	–	(73)	(73)
Transfers (IFRS 5)	–	(1)	(1)
Depreciation and impairment losses	(33)	(124)	(157)
Other changes	2	17	19
Right-of-use assets, December 31, 2019	187	570	757

Lease liabilities

	Former finance leases	Former operating leases	Totals
	€ million	€ million	€ million
Lease liabilities, January 1, 2019	193	656	849
Additions	–	91	91
Retirements	–	(76)	(76)
Transfers (IFRS 5)	–	(4)	(4)
Repayment	(34)	(109)	(143)
thereof lease rate	(46)	(130)	(176)
thereof interest portion	12	21	33
Other changes	1	17	18
Lease liabilities, December 31, 2019	160	575	735

As of January 1, 2019, property, plant and equipment and financial liabilities increased by €660 million and €656 million, respectively, due to the initial application of IFRS 16. The underlying leases relate mainly to leases for production and logistics infrastructure as well as real estate. The principal additions in fiscal 2019 comprise new leases for transport vessels, rail cars and electric buses. The retirements recorded in the reporting year are mainly the result of early termination of lease agreements for rail cars.

2.2 Published financial reporting standards that have not yet been applied

The IASB and the IFRS IC have issued the following standards, amendments to standards, and interpretations whose application has not yet been mandatory to date. The application of these IFRS standards is conditional upon their endorsement by the European Union.

IFRS pronouncement (published on)	Title	Effective for annual periods beginning on or after
Endorsed by the EU		
Amendments to IFRS Standards (March 29, 2018)	Amendments to References to the Conceptual Framework in IFRS Standards	January 1, 2020
Amendments to IAS 1 and IAS 8 (October 31, 2018)	Definition of Material	January 1, 2020
Amendments to IFRS 9, IAS 39 and IFRS 7 (September 26, 2019)	Interest Rate Benchmark Reform	January 1, 2020
Not yet endorsed by the EU		
Amendments to IFRS 3 (October 22, 2018)	Definition of a Business	January 1, 2020
IFRS 17 (May 18, 2017)	Insurance Contracts	January 1, 2021
Amendments to IAS 1 (January 23, 2020)	Classification of Liabilities as Current or Non- current	January 1, 2022

The date of initial application of the standards not yet endorsed by the EU is deemed to be the effective date stipulated by the IASB. Because the amendments to IFRS 3 (Business Combinations) outlined in the table above have not yet been endorsed by the EU, Covestro did not yet apply these changes as of January 1, 2020.

The effects of initial application of IFRS 17 (Insurance Contracts) and the amendments to IAS 1 (Presentation of Financial Statements) are currently being reviewed. Initial application of the other standards listed in the table is expected to have little or no material impact on the presentation of the net assets, financial position and results of operations. IFRS 17 and the amendments to IAS 1 are explained below.

On May 18, 2017, the IASB issued IFRS 17. IFRS 17 regulates the recognition, measurement and presentation of issued insurance contracts as well as the necessary disclosures in the notes. In addition, IFRS 17 requires the application of similar principles in the case of reinsurance contracts and, insofar as insurance contracts are issued, also investment contracts with a discretionary participation feature. IFRS 17 will replace IFRS 4 (Insurance Contracts).

On January 23, 2020, the IASB published amendments to IAS 1 under the title "Classification of Liabilities as Current or Non-current." The amendments define more precisely when a liability is to be classified as current or non-current in the statement of financial position if the settlement date is still uncertain.

3. Accounting Policies and Valuation Principles

Covestro's consolidated financial statements are based on the principle of the historical cost of acquisition, construction or production. Exceptions are items measured at fair value, such as certain financial assets and derivatives.

In preparing the consolidated financial statements, Covestro management has to make assumptions and estimates to a certain extent that may substantially impact the presentation of the Covestro Group's net assets, financial position, and results of operations and could deviate from the actual results. Such estimates, assumptions, and the exercise of discretion mainly relate to the following areas: defining the useful life of noncurrent assets, calculating the discounted cash flows used for impairment testing to be conducted at least annually, purchase price allocations, accounting for income taxes, the assessment of the amount of deferred tax assets recoverable in future periods as well as the recognition of provisions, (e.g. for litigation-related expenses, pensions and other employee benefits, other taxes, environmental compliance and remediation costs, and product liability). In addition, Covestro's management must decide which information is relevant for readers of the IFRS consolidated financial statements and should be included in the notes. Information about exercising discretion in the application of accounting policies that most significantly affect the amounts reported in the consolidated financial statements, and about estimates and assumptions, are disclosed in the following notes.

Consolidation

As of December 31, 2019, the direct and indirect subsidiaries of Covestro AG were fully consolidated in accordance with the principles of IFRS 10 (Consolidated Financial Statements). In addition, joint arrangements as defined by IFRS 11 (Joint Arrangements) were classified as joint operations and consolidated proportionately in the consolidated financial statements, or classified as joint ventures and accounted for in the same way as associated companies using the equity method in accordance with IAS 28 (Investments in Associates and Joint Ventures). For additional information, please see note 5.1 "Scope of consolidation and investments."

Joint operations and joint ventures

Joint operations and joint ventures are based on joint arrangements. A joint arrangement is deemed to exist if Covestro AG, through a contractual agreement, indirectly or directly jointly controls an activity together with one or more third parties. Joint control is only deemed to exist if decisions regarding the relevant activities require the unanimous consent of the parties sharing control.

A joint operation is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the assets attributable to the arrangement and obligations with regard to the liabilities attributable to the arrangement. The Covestro Group recognizes the share of assets, liabilities, revenues and expenses relating to its interest in a joint operation in accordance with its rights and obligations.

A joint venture is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the arrangement. Joint ventures are accounted for using the equity method.

Associates over which Covestro AG has significant influence, directly or indirectly, generally through an ownership interest between 20% and 50%, are also accounted for using the equity method.

Currency translation

The financial statements of the individual companies for inclusion in the consolidated financial statements are prepared in their respective functional currencies. The majority of consolidated companies carry out their activities autonomously from a financial, economic and organizational point of view, and their functional currencies are therefore the respective local currencies.

In the separate financial statements of the foreign companies, receivables and liabilities in currencies other than the respective functional currency are translated at closing rates. Related exchange differences are recognized in profit or loss and recorded as exchange gains or losses under other financial result.

In the consolidated financial statements, the assets and liabilities of Covestro companies outside the eurozone are translated into euros at closing rates at the start and end of the reporting period, while income and expense items and cash flows are translated into euros at average rates. Equity items are translated at historical rates.

Sales and other operating income

All revenues derived from the selling of products or rendering of services or from licensing agreements are recognized as sales. Other operational revenues are recognized as other operating income.

In principle, the amount of consideration from a contract with a customer to which Covestro expects to be entitled in exchange for the transfer of goods or services is recognized as sales when the customer obtains control of the corresponding goods or services.

Sales are generated primarily from the sale of chemical products. In most cases, control over these products is transferred to the customer at a point in time.

Depending on the contractual agreements made and transportation clauses agreed upon with the customer in the majority of cases control is transferred to the customer upon delivery at the place of destination, furthermore at the point in time of collection by the customer or upon handover to the freight carrier. In some cases, sales are made through consignment warehouses in which customers primarily obtain control over the delivered goods upon delivery to the consignment warehouse.

In principle, control is considered to be transferred when the customer can direct the use of the product to be delivered and obtain substantially all of the remaining benefits from the product, while this is no longer possible for Covestro.

Determining the point in time of the transfer of control involves considering additional indicators. In particular, it is considered at which point in time Covestro has a present right to payment for the product and when physical possession of the product or, in a broader sense, the possibility of sole access to the product, is transferred to the customer. Depending on the transportation clauses, the possibility of sole access to the product may be transferred even prior to arrival or physical handover of the product to the customer. Furthermore, the point in time when the legal title passes to the customer is also considered to the extent that it constitutes more than a protective right. The point in time when the significant rewards and risks of ownership of a product are transferred to the customer is usually linked closely with the aforementioned indicators and is therefore considered with these. Based on experience, it is assumed that products sold fulfill the agreed-upon specifications, thus acceptance by the customer is an indicator that does not generally affect the point in time at which control is transferred.

As a result, depending on the contractual agreements made and transportation clauses agreed upon with the customer, the point in time of the transfer of control is determined.

In the case of products sold through a consignment warehouse, the customer generally obtains physical possession of this product upon delivery to the consignment warehouse. In addition, the right to payment for the delivered goods generally arises upon delivery. To the extent that the other three indicators do not lead to a contrary conclusion, control of the products in the case of a sale through a consignment warehouse transfers to the customer upon delivery to the consignment warehouse. The corresponding sales are therefore realized at the time of delivery.

Certain products are only sold to one customer. Some of these customer-specific products have no alternative use for Covestro. Insofar as Covestro has an enforceable right to payment for performance completed to date, sales are recognized on the basis of progress towards complete satisfaction of the performance obligation. As a rule, control over an individual customer-specific product is considered to be transferred when the generally short production process is completed successfully and the product has been tested to confirm that the agreed-upon specifications have been met.

To the extent that, for certain types of performance obligations that are satisfied over time, there is a right to consideration in an amount that corresponds directly with the value of the performance provided by Covestro to date, revenue will normally be realized in the amount to which Covestro has a right to invoice.

Invoices are usually payable in 0 to 90 days. Contracts may contain early payment discounts or rebates. Rebates are generally retroactively granted sales- or volume-dependent rebates based on the sales or volume of a period customarily spanning up to 12 months. Some contracts include pricing formulas used to determine the billable price at the time of delivery. Moreover, the final prices for certain contracts with customers are not yet fixed at the time of transfer of control. Instead, provisional prices are billed initially.

Sales are recognized in the amount of the transaction price that Covestro is expected to receive. Sales do not include amounts collected on behalf of third parties (e.g. sales tax). Where consideration includes a variable component, for example due to the contract clauses described, this component of the consideration is estimated either based on the expected value method or the most likely amount. The method producing the best estimate is used in this case. However, variable consideration is only taken into account to the extent it is not constrained as defined by IFRS 15. Variable consideration is not constrained if it is highly probable that a significant reversal in the amount of sales will not occur when the corresponding uncertainty is subsequently resolved. The transaction price of a contract is allocated to the performance obligations therein using the relative stand-alone selling prices, which generally correspond to the agreed upon prices. If the conditions are met, variable amounts are completely allocated to individual performance obligations.

Refund liabilities result particularly from rebates granted and total the amount of the rebate expected to be refunded, which is calculated based on the methods described.

As a rule, no warranties are issued beyond normal warranties that products will fulfill the agreed-upon specifications.

In the case of contracts with customers, Covestro generally does not expect more than one year to pass between the transfer of a product to a customer and the payment thereof. As a result, the agreed consideration is not adjusted for significant financing components. When incremental costs of obtaining a contract arise, these are immediately recognized as expenses, if the potential amortization period is one year or less.

Research and development expenses

Research and development expenses are incurred in the Covestro Group for in-house research and development activities as well as research and development collaborations and alliances with third parties.

According to IFRSs, research costs cannot be capitalized. Development costs, on the other hand, must be capitalized according to closely defined conditions. An intangible asset must be recognized if there is reasonable certainty of receiving future cash flows that will cover an asset's carrying amount. Covestro's development projects are often subject to uncertainties, so the conditions for the capitalization of development costs are normally not satisfied. Each project or contract is reviewed to determine potential capitalization requirements.

Income taxes

Income taxes comprise the taxes levied on taxable income in the individual countries along with changes in deferred tax assets and liabilities that are recognized in profit or loss. The income taxes recognized are reflected at the amounts likely to be payable or reimbursable under the statutory regulations in force, or already enacted in relation to future periods, at the end of the reporting period.

As a rule, deferred taxes are recognized in profit or loss. However, if deferred taxes relate to items recognized outside profit or loss in equity, they, too, are recognized outside profit or loss.

The probability that deferred tax assets resulting from temporary differences, tax credits or loss carryforwards can be utilized in the future is the subject of forecasts by the individual companies regarding the future earnings situation in the respective Covestro companies and other parameters.

Deferred tax liabilities are recognized on planned dividend payments by subsidiaries. Where no dividend payment or disposal of corresponding equity investments is planned for the foreseeable future, no deferred tax liability is recognized on the difference between the proportionate equity according to IFRSs and the tax base of the carrying amount of the investment in the subsidiary.

The expected effects of uncertain deferred and actual income tax positions are estimated in accordance with IFRIC 23 (Uncertainty over Income Tax Treatments) either based on the expected value method or the most likely amount. The method producing the best estimate is used in this case. Tax audits in which the relevant tax authority could take a view differing from Covestro's legal position are by far the most important sources of estimation uncertainties for uncertain tax positions. Uncertain tax positions are accounted for under the assumption that the tax authorities will investigate all relevant matters and have all relevant information at their disposal.

Goodwill

Goodwill is not amortized. Its carrying amount is subjected to impairment testing annually or more often if there is any indication of possible impairment. Detailed explanations of impairment testing can be found under "Procedure used in global impairment testing and its impact." Once an impairment loss has been recognized on goodwill, it cannot be reversed in subsequent periods.

Other intangible assets

An "other intangible asset" is an identifiable nonmonetary asset without physical substance, other than goodwill (such as software or rights). Other intangible assets are recognized at the cost of acquisition or generation. Those with a determinable useful life are amortized accordingly on a straight-line basis over a period of up to 20 years, except where their actual depletion demands a different amortization pattern. Determination of the expected useful lives of other intangible assets is based on estimates of the period for which they will generate cash flows.

Property, plant and equipment

Property, plant and equipment are carried at the cost of acquisition or construction and depreciated by the straight-line method over the expected useful life. An impairment loss is recognized in addition if an asset's recoverable amount falls below its carrying amount.

If the construction phase or manufacturing process of property, plant or equipment extends over a period of 12 months or more, the interest incurred on borrowed capital up to the date of completion is capitalized as part of the cost of acquisition or construction in accordance with IAS 23 (Borrowing Costs).

Costs for regular, comprehensive maintenance work (such as the major overhaul of a technical facility) are capitalized as a separate component if they satisfy special recognition criteria.

The following depreciation periods are generally applied throughout the Covestro Group:

Useful life of property, plant and equipment

Buildings	20 to 50 years
Infrastructure	10 to 20 years
Storage tanks and pipelines	10 to 20 years
Plant installations	6 to 20 years
Machinery and equipment	6 to 12 years
Furniture and fixtures	4 to 10 years
Vehicles	5 to 8 years
Computer equipment	3 to 5 years
Laboratory and research facilities	3 to 5 years

Significant asset components with different useful lives are accounted for and depreciated separately. Right-of-use-assets for leases are recognized in property, plant and equipment.

When assets are sold, closed down or scrapped, the difference between the net proceeds and the net carrying amount of the assets is recognized as a gain or loss in other operating income or expenses, respectively.

Impairment of other intangible assets and property, plant and equipment

If there are indications that an individual item of intangible assets or property, plant and equipment may be impaired, the recoverable amount is compared to the carrying amount to determine whether it is higher or lower. If the recoverable amount is less than the carrying amount, an impairment loss is recognized for the difference. If the reasons for a previously recognized impairment loss no longer apply, the impairment loss is reversed provided that the reversal does not cause the carrying amount to exceed the original (amortized) cost of acquisition or generation.

Both depreciation or amortization and impairment losses are recognized in the functional cost in line with the use of the relevant asset.

Inventories

Inventories are recognized at their cost of acquisition or production (production-related full cost) – calculated by the weighted-average method – or at their net realizable value, whichever is lower. The net realizable value is the estimated selling price in the ordinary course of business less estimated cost to complete and selling expenses.

Financial instruments

Contracts are recognized as financial instruments in the financial statements which simultaneously give rise to a financial asset at one entity while resulting in a financial liability or equity instrument at another entity. Accordingly, financial assets are recognized in the consolidated financial statements if the Covestro Group has a contractual right to receive cash or other financial assets from another entity. Regular-way purchases and sales of financial assets are generally posted on the settlement date. Financial liabilities are initially recognized in the consolidated financial statements if Covestro has a contractual obligation to transfer cash or other financial assets to another entity. With the exception of trade accounts receivable, financial instruments are measured at fair value plus directly attributable transaction costs upon initial recognition. For financial instruments measured at fair value through profit or loss, transaction costs are recognized directly in the income statement. Trade accounts receivable are recognized at their transaction price. Subsequent measurement of financial instruments is based on their classification in the categories stipulated in IFRS 9 (Financial Instruments).

Financial assets

Financial assets comprise loans, acquired equity and debt instruments, cash and cash equivalents, other financial assets, and derivatives with positive fair values. The classification and measurement of financial assets is based on the business model pursued by the Covestro Group with regard to the management of its financial assets for the purpose of collecting cash flows, and on the characteristics of the contractual cash flows from the relevant financial assets (cash flow condition). Subsequent measurement takes place according to the measurement rules for the respective category, as described below.

Financial assets carried at amortized cost comprise nonderivative financial assets that are held as part of a business model that aims to collect contractual cash flows and that additionally fulfill the cash flow condition, i.e., the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding. This category comprises trade accounts receivable, the loans included in other financial assets, the additional financial receivables reflected in other receivables, and cash and cash equivalents. Interest income from financial assets assigned to this category is determined using the effective interest method.

Financial assets carried at fair value through other comprehensive income encompass debt instruments held as part of a business model that aims to obtain cash flows from the instrument both by collecting contractual payments as well as through the sale thereof, and that additionally fulfill the cash flow condition. Acquired bonds may be classified in this category to the extent that they are intended to be sold before they mature. Interest income, foreign currency gains and losses, and impairment losses or impairment loss reversals are recognized in the income statement for financial assets in this category. The remaining fair value changes are recognized in other comprehensive income. Upon derecognition, the cumulative net gains or losses included in other comprehensive income are reclassified to the income statement.

The Covestro Group exercises the option of recognizing changes in the fair value of equity instruments that are not held for trading in other comprehensive income. In contrast to the treatment of debt instruments, the gains and losses recognized in other comprehensive income are not reclassified to the income statement upon derecognition, and no impairment losses are recognized in profit or loss.

Financial assets carried at fair value through profit or loss are all financial assets not assigned to any of the above categories and particularly include derivatives with positive fair values. The Covestro Group does not opt to measure financial assets at fair value for the purpose of avoiding or minimizing accounting mismatches.

Financial assets are derecognized when contractual rights to receive cash flows from the financial assets expire or the financial assets are transferred together with all significant risks and rewards.

Cash and cash equivalents

Cash and cash equivalents comprise cash, checks received and balances with banks. Cash equivalents are highly liquid short-term financial investments that are subject to an insignificant risk of changes in value, are easily convertible into a known amount of cash, and have a maturity of three months or less from the date of acquisition or investment.

Derivatives

Derivatives – such as forward exchange contracts – are used to mitigate the risk of fluctuations in exchange rates. Derivatives are recognized at the trade date.

Contracts concluded in order to receive or deliver nonfinancial goods for the company's own purposes are not accounted for as derivatives but treated as pending transactions. Where embedded derivatives are identified that are required to be separated from the pending transactions, they are accounted for separately. To take advantage of market opportunities or cover possible peak demand, a nonmaterial volume of transactions may be entered into for which the possibility of immediate resale cannot be excluded. Such transactions are allocated to separate portfolios upon acquisition and accounted for as derivatives according to IFRS 9.

Derivatives are carried at fair value. This relates to what are known as standalone derivatives as well as derivatives embedded in certain types of contracts and therefore required to be accounted for separately from their host contracts. Positive fair values at the end of the reporting period are reflected in financial assets, negative fair values in financial liabilities. Changes in the fair values of these derivatives are recognized directly in profit or loss in the other operating result. Changes in the fair values of forward exchange contracts and currency options serving as hedging instruments for items in the statement of financial position are divided into an interest and a currency component. The interest component is recognized in interest expense or income and the currency component is recognized as exchange gains or losses in the other financial result. Changes in the fair value of forward exchange contracts used to hedge forecasted transactions in foreign currencies are recognized in other operating result.

Covestro does not apply hedge accounting.

Financial liabilities

Financial liabilities comprise primary financial liabilities and negative fair values of derivatives.

In subsequent periods, such nonderivative liabilities are measured at amortized cost using the effective interest method. The Covestro Group does not opt to measure financial liabilities at fair value to avoid or minimize accounting mismatches.

Financial liabilities are derecognized when the contractual obligation is discharged or canceled, or has expired.

Provisions for pensions and other post-employment benefits

Within the Covestro Group, post-employment benefits are provided under defined contribution and defined benefit plans. In the case of defined contribution plans, the company pays contributions to publicly or privately administered pension plans on a mandatory, contractual or voluntary basis. Once the contributions have been paid, the company has no further payment obligations. The regular contributions constitute expenses for the year in which they are due and as such are included in the functional cost items, and thus in income after income taxes plus financial result and income tax expense (EBIT). All other post-employment benefit systems are defined benefit plans, which may be either unfunded, i.e. financed by provisions, or funded, i.e. financed through pension funds.

The present value of the defined benefit obligations and the resulting expense are calculated in accordance with IAS 19 (Employee Benefits) by the projected unit credit method. The future benefit obligations are valued by actuarial methods and spread over the entire employment period on the basis of specific assumptions regarding beneficiary structure and the economic environment. These relate mainly to the discount rate, future salary and pension increases, variations in health care costs, and mortality rates.

The discount rates used are calculated from the yields of high-quality corporate bond portfolios in specific currencies with cash flows approximately equivalent to the expected cash outflows from the pension plans. The uniform discount rate derived from this interest rate structure is thus based on the yields, at the closing date, of a portfolio of corporate bonds with at least an AA or AAA rating whose weighted residual maturities approximately correspond to the duration necessary to cover the entire benefit obligation.

The fair value of plan assets is deducted from the present value of the defined benefit obligation for pensions and other post-employment benefits to determine the net defined benefit liability. Plan assets in excess of the benefit obligation are reflected in other receivables, subject to the asset ceiling specified in IAS 19. Comprehensive actuarial valuations for all major plans are performed annually as of December 31.

The balance of all income and expenses relating to defined benefit plans, except the net interest on the net liability, is recognized in EBIT. The net interest is reflected in the financial result.

The effects of remeasurements of the net defined benefit liability are reflected in other comprehensive income. They consist of actuarial gains and losses, the return on plan assets and changes in the effects of the asset ceiling, less the respective amounts included in net interest for the last two components. Deferred taxes relating to the effects of remeasurements are also recognized in other comprehensive income.

Other provisions

Other provisions are measured in accordance with IAS 37 (Provisions, Contingent Liabilities and Contingent Assets) or, where applicable, IAS 19 (Employee Benefits). Where the cash outflow to settle an obligation is expected to occur after one year, the provision is recognized at the present value of the expected cash outflow. Claims for reimbursements from third parties are separately reflected in other receivables if their realization is virtually certain.

If the projected obligation declines as a result of a change in the estimate, the provision is reversed by the corresponding amount and the resulting income recognized in the operating expense item(s) in which the original charge was recognized.

To enhance the information content of the estimates, certain provisions that could have a material effect on the net assets, financial position and results of operations are selected and tested for their sensitivity to changes in the underlying parameters using sensitivity analysis. To reflect uncertainty about the likelihood of the assumed events actually occurring, the impact of a five-percentage-point change in the probability of occurrence is examined in each case.

Provisions for environmental protection are recorded if future cash outflows are likely to be necessary to ensure compliance with environmental regulations or to carry out remediation work, such costs can be reliably estimated, and no future benefits are expected from such measures.

Estimating the future costs of environmental protection and remediation involves many uncertainties, particularly with regard to the status of laws, regulations and the information available about conditions in the various countries and at the individual sites. Significant factors in estimating the costs include previous experiences in similar cases, the conclusions in expert opinions obtained regarding existing environmental programs, current costs, and new developments affecting costs. Also taken into consideration are management's interpretation of current environmental laws and regulations, the number and financial position of third parties that may become obligated to participate in any remediation costs on the basis of joint liability, and the remediation methods likely to be deployed. Changes in these assumptions could impact future reported results.

Taking into consideration experience gained to date regarding environmental matters of a similar nature, Covestro's management believes the existing provisions to be adequate based upon currently available information. Given the businesses in which the Covestro Group operates and the difficulties inherent in accurately estimating liabilities for environmental protection, it remains possible that material additional costs will be incurred beyond the amounts accrued. It may transpire during remediation work that additional expenditures are necessary over an extended period and that these exceed existing provisions and cannot be reasonably estimated.

Provisions for restructuring only cover expenses that arise directly from restructuring measures, are necessary for restructuring and are not related to future business operations. Such expenses include severance payments to employees and compensation payments in respect of rented property that can no longer be used.

Restructuring measures may include the sale or termination of business units, site closures, relocations of business activities or fundamental reorganizations of business units. The respective provisions are established when a detailed restructuring plan has been drawn up, resolved upon by the responsible decision-making level of management and communicated to the employees and/or their representatives. Provisions for restructuring are generally established at the present value of future cash outflows.

As a global enterprise, the Covestro Group is exposed to numerous legal risks for which provisions for litigations must be established under certain conditions – including especially in the areas of product liability, competition and antitrust law, patent disputes, tax law, environmental law, and compliance issues such as corruption and export control.

Litigation and other judicial proceedings often raise complex issues and are subject to many uncertainties and complexities including, but not limited to, the facts and circumstances of each particular case, the jurisdiction in which each suit is brought and differences in applicable law. The outcomes of currently pending and future proceedings generally cannot be predicted. Judgment in court proceedings, regulatory decisions or the conclusion of a settlement may result in the Covestro Group incurring charges for which no accounting measures have been taken for lack of reasonable estimate or which exceed established provisions and insurance coverage.

The Covestro Group considers the need for accounting measures in respect of pending or future litigations, and the extent of any such measures, on the basis of the information available to its legal department and in close consultation with legal counsel acting for the Covestro Group.

Where it is more likely than not that such a litigation will result in an outflow of resources that is already reasonably estimable, a provision for litigation is normally recorded in the amount of the present value of the expected cash outflows. Such provisions cover the estimated unavoidable payments to the plaintiffs, court and procedural costs, attorney costs, and the cost of potential settlements.

It is often impossible to reliably determine the existence of a present obligation or reasonably estimate the probability that a potential outflow of resources will result from a pending or future litigation. Due to the special nature of these litigations, provisions generally are not established until initial settlements allow an estimate of potential amounts or judgments have been issued and not before at least a range of possible legal outcomes of such litigations is possible. Provisions for legal defense costs are established if it is probable that material costs will have to be incurred for external legal counsel to defend the company's legal position.

Internal and external legal counsels evaluate the current status of the material legal risks of the Covestro Group at the end of each reporting period. The need to establish or adjust a provision and the amount of the provision or adjustment are determined on this basis. Adjusting events are reflected up to the date of preparation of the consolidated financial statements.

The status of the material legal risks is described in note 26 "Legal Risks."

Personnel-related provisions are mainly those recorded for variable one-time payments, individual performance awards, long-service awards, severance payments in connection with early retirement arrangements, surpluses on long-term accounts and other personnel costs.

Obligations under stock-based compensation programs that provide for awards payable in cash are also included here. The compensation of the Board of Management of Covestro AG and of managerial employees includes stock-based compensation components that are earned with lock-up periods and are reflected in profit or loss as personnel expenses in line with the consideration paid in the performance period. They are measured using a subscription price model at the time of granting and at each reporting date in accordance with IFRS 2 (Share-based Payment).

Miscellaneous provisions include those for other liabilities, product liability and warranties.

Other receivables and liabilities

Grants and subsidies from third parties that serve to promote investment are reflected in the statement of financial position under other liabilities, and amortized to income over the useful lives of the respective investments.

Leasing

A lease exists when the lessor grants the lessee the contractual right to control an identified asset for a specified period of time and in return the lessor receives consideration from the lessee.

When Covestro is the lessee in a lease, as a rule a right-of-use asset and a corresponding liability (lease liability) are recognized in the statement of financial position on the date the underlying asset is made available for use to Covestro.

The right-of-use asset represents a lessee's right to use the asset being leased in return for payment. Upon initial recognition, the right-of-use asset is generally capitalized at the amount of the corresponding lease liability plus any initial direct costs, any dismantling obligations and lease payments made prior to the commencement date less any lease incentives received. For subsequent measurement, the right-of-use asset is depreciated over the lease term. Contract modifications, as long as these are not measured as separate leases, and reassessment of the lease liability are also reflected in the right-of-use asset. The right-of-use asset is included in the line item property, plant and equipment in the statement of financial position. Impairment testing and reporting of any impairment losses are carried out for the right-of-use assets in the statement of financial position in accordance with the regulations applicable to property, plant and equipment.

The lease liability represents the company's obligation to make contractual lease payments and is measured as the present value of precisely these outstanding lease payments. While IFRS 16 requires use of the interest rate implicit in the lease in order to calculate the present value, it is frequently not possible to ascertain this interest rate. Accordingly, the incremental borrowing rate is generally applied in discounting the lease payments. If the outstanding lease payments include fixed payments or variable lease payments that depend on an index or an interest rate, these are taken into consideration in the lease liabilities. Variable lease payments that depend on an index or an interest rate are measured at the underlying index or interest rate as soon as this is to be applied. If, as an exception, there are residual value guarantees, purchase options or penalty fees, these are to be recognized accordingly in the lease liability to the extent that they are anticipated. At Covestro, lease agreements usually include fixed contract terms. Additionally, options to extend and terminate the lease exist particularly for the rental of production and logistics infrastructure and of real estate. In order to assess whether options to extend or terminate the lease are reflected in the lease term, all relevant facts are examined to determine the existence of economic incentives to exercise or not to exercise these options. The lease term is only adjusted to reflect changes in the expectations regarding whether or not such options will be exercised if there is reasonable

certainty. The effective interest method is used for the subsequent measurement of lease liabilities. Using this method, periodic lease payments with an effect on cash flows are divided into an interest portion which affects profit or loss and a repayment portion not affecting profit or loss. Lease liabilities are reported in financial liabilities classified as current or noncurrent according to their maturity.

Overall, effects on income from leases to be recognized in accordance with IFRS 16 comprise depreciation of the right-of-use asset and any impairment losses on the right-of-use asset (operating result), discounting and subsequent measurement of the lease liability (financial result) and in cases in which a lease agreement is modified. Such lease modifications can result, for instance, from options to terminate or extend a lease which were previously not explicitly stipulated in the contract. Contractual lease payments for leases accounted for in accordance with IFRS 16 are shown solely under cash flows from financing activities.

IFRS 16 provides exemptions for applying the recognition and measurement rules for leases with a term of less than 12 months, those with a low-value underlying asset or if the underlying asset is an intangible asset. Covestro considers an asset to be of low value if the new value is less than €5,000. Leases are not recognized as a depreciable right-of-use asset on the balance sheet or as a lease liability at Covestro for the exceptions referenced above. Corresponding contractual payments are shown in the cash flows from operating activities and the same amount is recognized as an expense in the operating result.

For leases in which Covestro is the lessor, a differentiation is made between finance lease and operating lease in accordance with IFRS 16. Leases that transfer substantially all the risks and rewards incidental to ownership of the leased asset to the lessee are treated as finance leases. At the commencement date, the lessor recognizes a lease receivable in the statement of financial position in the amount of the net investment in the lease and derecognizes the underlying asset from the noncurrent assets. The net investment routinely comprises the present value of future contractual lease payments. Any lease incentives or variable lease payments that depend on an index or an interest rate to be paid by the lessee, as well as any residual value guarantees or other contractual payment claims against the lessee can be included in the net investment. The lessor applies the interest rate implicit in the lease for initial measurement of the net investment or the lease receivable. Using this method, periodic lease payments with an effect on cash flows are divided into an interest portion which affects profit or loss and a repayment portion not affecting profit or loss; the interest portion is shown in the financial result. The effective interest method is applied for the subsequent measurement of the net investment or lease receivable. In an operating lease, the underlying asset continues to be shown under the lessor's noncurrent assets and depreciated over the useful life. Lease payments received are recorded as sales.

Acquisition accounting

Acquired businesses are accounted for using the acquisition method, which requires that the assets acquired and liabilities assumed be recorded at their respective fair values on the date control is obtained. Ancillary acquisition costs are recognized as expenses in the periods in which they occur.

Procedure used in global impairment testing and its impact

Global impairment testing is performed at the level of cash-generating units. A cash-generating unit (CGU) is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The Covestro Group regards its strategic business entities as cash-generating units and subjects them to global impairment testing. The cash-generating units usually constitute the first financial reporting level below the reportable segments.

Cash-generating units are globally tested if there is an indication of possible impairment. Those to which goodwill is allocated are tested at least annually.

In the case of impairment, the resulting expense is reflected for goodwill in other operating expenses and for other assets in the functional item of the income statement in which the depreciation or amortization of the respective assets is recognized. The same applies to income from impairment loss reversals, although impairment losses on goodwill may not be reversed.

The recoverable amount is generally determined on the basis of the fair value less costs of disposal, taking into account the present value of the future cash flows as market prices for the individual units are normally not available. The forecasts of future cash flows generally have a planning horizon of three to five years and are based on the Covestro Group's current planning. Forecasting involves making assumptions, based on internal Group estimates and external sources, especially regarding future selling prices, sales volumes, costs, market growth rates, economic cycles and exchange rates. Where the recoverable amount is the fair value less costs of disposal, the cash-generating unit is measured from the viewpoint of an independent market participant. Cash flows beyond the planning period are determined on the basis of long-term business expectations using the respective individual growth rates derived from market information. The measurement of fair value less costs of disposal is based on unobservable inputs (Level 3 of the fair value hierarchy).

The net cash inflows are discounted at the weighted average cost of capital (WACC), which is calculated as the weighted average cost of equity and cost of debt. To take into account the risk and return profile of the Covestro Group, an after-tax cost of capital is calculated and a specific capital structure is defined by benchmarking against comparable companies in the same industry sector ("peer group"). The cost of equity corresponds to the return expected by stockholders, while the cost of debt is based on the terms at which the peer group can obtain long-term financing. In principle, both components are derived from capital market information.

The growth rates for the terminal value applied for impairment testing in fiscal 2019 amounted to 1% (previous year: 1%) for the Polyether Polyols CGU in the Polyurethanes reporting segment and 2% (previous year: 2%) in each case for the following CGUs: Diphenylmethane Diisocyanate (MDI) and Toluene Diisocyanate (TDI) in the Polyurethanes reporting segment; Polycarbonates (PCS) in the Polycarbonates reporting segment; and Base & Modified Isocyanates (BMI), Resins (RES), and Specialty Films (SF) in the Coatings, Adhesives, Specialties reporting segment. These growth assumptions reflect in particular economic cycles over several years as well as expectations for capacity and the market for each cash-generating unit. The after-tax capital cost factor used to discount the expected cash flows was 6.4% (previous year: 6.5%).

As was the case in the previous year, no impairment losses were recognized on goodwill in the reporting period on the basis of the global annual impairment testing of the cash-generating units. In the fiscal year, impairment losses on property, plant and equipment and intangible assets amounted to €28 million (previous year: €7 million) and impairment loss reversals on property, plant and equipment and intangible assets amounted to €1 million (previous year: €0 million). Details are provided in notes 13 "Goodwill and Other Intangible Assets" and 14 "Property, Plant and Equipment."

Although the estimates of the useful lives of certain assets, assumptions concerning the macroeconomic environment and developments in the industries in which the Covestro Group operates, and estimates of the discounted future cash flows are believed to be appropriate, changes in assumptions or circumstances could require changes in the analysis. This could lead to additional impairment losses in the future or – except in the case of goodwill – to reversals of previously recognized impairment losses if developments are contrary to expectations.

The sensitivity analysis for cash-generating units to which goodwill is allocated was based on a 10% reduction in the future free operating cash flow, a 10% increase in the WACC, or a one-percentage-point reduction in the long-term growth rate. On this basis, there would be no need to recognize an impairment loss for any of the cash-generating units.

The same applies at the measurement date to other deviations from the assumptions used in the impairment testing that were deemed possible.

Fair value

According to IFRS 13 (Fair Value Measurement), fair value is the price that would be received to sell an asset or paid to transfer a liability at the measurement date in an orderly transaction in a primary market or, if such is not available, in the most favorable market to which the Covestro Group has access at that time. In essence, the fair value of a liability reflects the risk of nonfulfillment.

If available, the Covestro Group calculates the fair value of a financial instrument based on quoted prices in an active market for this instrument. A market is regarded as active when transactions for the respective asset or liability take place with sufficient frequency and volume to provide regular pricing information at the reporting date.

If no quoted prices on an active market exist, measurement methods are used which maximize the use of relevant observable inputs and minimize the use of non-observable inputs. All factors taken into account by market participants in pricing such a transaction are incorporated into the relevant method of measurement.

Depending on the asset or liability category, specific information is provided about the principles for using or determining fair value. In the Covestro Group, this generally applies to items in the financial statements as well as disclosures in the notes.

Impairment losses

The Covestro Group calculates a risk provision for expected credit losses for the following items:

- financial assets measured at amortized cost,
- debt instruments measured at fair value through other comprehensive income,
- financial guarantees and loan commitments,
- contract assets.

For financial instruments without a significant increase in credit risk since initial recognition, the amount of the risk provision for expected credit losses equals the credit losses expected to occur within the next twelve months. For financial instruments with a significant increase in credit risk, a risk provision is calculated in the amount of the credit losses expected over their residual maturity.

Relevant data from within and outside the company that can be obtained with reasonable effort is considered when determining whether the credit risk has increased substantially since initial recognition. For instance, the financial data of counterparties or customers, ratings, the payment histories of counterparties or customers, and forward-looking information are all assessed. It is assumed that a significant increase in credit risk has occurred when the financial asset is more than 30 days past due.

A default event has occurred when the Covestro Group comes to the conclusion that the counterparty is highly unlikely to be able to meet its payment obligations in full.

In the case of trade accounts receivable and contract assets, the amount of the risk provision is equal to the credit losses expected over their remaining term.

At each reporting date, the Covestro Group determines whether financial assets measured at amortized cost or at fair value through other comprehensive income are credit impaired. Indicators of credit impairment of a financial asset include observable data regarding the following events:

- significant financial difficulties of the issuer or borrower,
- a breach of contract, such as default or delinquency,
- concessions that Covestro makes to the borrower for financial or legal reasons relating to the financial difficulties of the borrower that it would not otherwise make,
- it is becoming probable that the borrower will enter bankruptcy or other financial reorganization,
- the loss of an active market for this financial asset.

The gross carrying amount of a financial asset is derecognized when the Covestro Group comes to the conclusion that the counterparty is no longer able to meet its payment obligations. Following derecognition, the Covestro Group assumes that it will no longer be able to recover any significant amounts.

Accounting policies and valuation principles applied as of December 31, 2018

Leases

Leases are classified as either finance or operating leases. Leasing transactions that transfer substantially all the risks and rewards incidental to ownership of the leased asset to the lessee are treated as finance leases.

Where the Covestro Group is the lessee in a finance lease, the leased asset is capitalized at the lower of the fair value of the asset and the present value of the minimum lease payments at the beginning of the lease term and simultaneously recognized under financial liabilities. The minimum lease payments are divided into the interest portion and the principal portion of the remaining obligation, which is determined using the effective interest method. The leased asset is depreciated using the straight-line method over the shorter of its estimated useful life or the lease term.

4. Segment and Regional Reporting

The Board of Management of Covestro AG, as the chief operating decision maker of the Covestro Group, allocates resources to the operating segments and assesses their performance. The reportable segments and regions are identified, and the disclosures selected, in line with the internal financial reporting system (management approach). These are based on the same accounting policies as described for the Covestro Group in note 3 "Accounting Policies and Valuation Principles."

As of December 31, 2019, the Covestro Group comprises three reportable segments with the following activities:

Polyurethanes

The Polyurethanes segment develops, produces and markets high-quality precursors for polyurethanes. These precursors are toluene diisocyanate (TDI), diphenylmethane diisocyanate (MDI) and polyether polyol. Flexible polyurethane foam is used primarily in the furniture and automotive industries (e.g. in upholstered furniture, mattresses and car seats). Rigid foam is used mainly in the construction industry as an insulating material as well as along the entire refrigeration chain. The segment operates production facilities worldwide as well as systems houses for formulating and supplying customized polyurethane systems.

Polycarbonates

The Polycarbonates segment develops, produces and markets the high-performance plastic polycarbonate in the form of granules, composite materials and semifinished products (sheets). The material is used primarily in the automotive industry (e.g. in the passenger compartment and for vehicle lighting) and in the construction industry (e.g. for roof structures). It is also used in the electrical and electronics industry (e.g. for connector housings, computer cases and DVDs), the medical technology sector and the lighting industry (e.g. for LED components). The Covestro Group produces polycarbonate all around the world and processes it at compounding centers to meet specific customer requirements.

Coatings, Adhesives, Specialties

The Coatings, Adhesives, Specialties segment develops, produces and markets precursors for coatings, adhesives and sealants as well as specialties – primarily for polyurethane systems. They include polymer materials and aqueous dispersions based on the isocyanates HDI and IPDI, which are produced at facilities located throughout the world. The main areas of application are automotive and transportation, infrastructure and construction, wood processing, and furniture. The specialties comprise elastomers, high-quality films and precursors for the cosmetics, textiles, and health care sectors.

Business activities that cannot be allocated to any of the aforementioned segments are reported under **"All other segments"**. The external sales from these activities are generated mainly from by-products of chlorine production and use.

The costs of Corporate Center functions and higher or lower expenses for long-term stock-based compensation arising from fluctuations in the performance of Covestro AG stock are presented in the segment reporting as **"Corporate Center and reconciliation."**

The segment data are calculated as follows:

- Core volume growth* refers to the core products in the Polyurethanes, Polycarbonates and Coatings, Adhesives, Specialties segments. It is calculated as the percentage change in externally sold volumes in thousand metric tons compared with the prior year. Covestro also takes advantage of business opportunities outside its core business, for example the sale of precursors and by-products such as hydrochloric acid, sodium hydroxide solution, and styrene. These transactions are not included in core volume growth.
- EBIT and EBITDA are not defined in the International Financial Reporting Standards. EBIT is equal to income after income taxes plus financial result and income taxes. EBITDA is the EBIT as reported in the income statement plus depreciation and impairment losses on property, plant, and equipment and amortization and impairment losses on intangible assets, less impairment loss reversals.
- Free operating cash flow is the operating cash flows less cash outflows for additions to property, plant, and equipment and intangible assets. As a component of operating cash flows, income taxes paid are not directly attributed to any particular unit of the company. For purposes of calculating operating cash flows, the income taxes paid of a reporting segment are determined according to the management approach by multiplying the effective tax rate (ETR) expected for the fiscal year by that segment's EBIT.
- Working capital comprises inventories plus trade accounts receivable, less trade accounts payable.

The following tables show the segment reporting data:

Key data by segment

	Other/Consolidation					Covestro Group
	Polyurethanes	Polycarbonates	Coatings, Adhesives, Specialties	All other segments	Corporate Center and reconciliation	
	€ million	€ million	€ million	€ million	€ million	€ million
2019						
Sales	5,779	3,473	2,369	791	–	12,412
Core volume growth ¹	+2.3%	+2.7%	–1.0%			+2.0%
EBITDA	648	536	469	13	(62)	1,604
EBIT	250	300	352	12	(62)	852
Free operating cash flow	32	404	191	(87)	(67)	473
Cash outflows for additions to property, plant and equipment and intangible assets	543	209	158	–	–	910
Depreciation, amortization and impairment losses	(398)	(236)	(117)	(1)	–	(752)
of which impairment losses	(5)	(22)	(1)	–	–	(28)
of which impairment loss reversals	–	1	–	–	–	1
Research and development expenses	(94)	(81)	(95)	3	1	(266)
2018						
Sales	7,362	4,051	2,361	842	–	14,616
Core volume growth ¹	+0.8%	+3.0%	+2.3%			+1.5%
EBITDA	1,763	1,036	464	9	(72)	3,200
EBIT	1,412	861	371	8	(72)	2,580
Free operating cash flow	972	468	203	93	(67)	1,669
Cash outflows for additions to property, plant and equipment and intangible assets	414	186	106	1	–	707
Depreciation, amortization and impairment losses	(351)	(175)	(93)	(1)	–	(620)
of which impairment losses	(2)	(4)	(1)	–	–	(7)
of which impairment loss reversals	–	–	–	–	–	–
Research and development expenses	(102)	(79)	(90)	(6)	1	(276)

¹ Reference values calculated based on the definition of the core business effective March 31, 2019. Not an IFRS KPI, reported voluntarily

* Not an IFRS KPI, reported voluntarily

Working capital by segment

	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million
Polyurethanes	1,018	860
Polycarbonates	769	562
Coatings, Adhesives, Specialties	500	485
Total of reportable segments	2,287	1,907
All other segments	85	73
Corporate Center	(10)	(10)
Working capital	2,362	1,970
of which inventories	2,213	1,916
of which trade accounts receivable	1,786	1,561
of which trade accounts payable	(1,637)	(1,507)

Information by geographical areas

The following table shows information by geographical area. The EMLA region consists of Europe, the Middle East, Africa and Latin America except Mexico, which together with the United States and Canada forms the NAFTA region. The APAC region includes Asia and the Pacific region.

Regional reporting¹

	EMLA	NAFTA	APAC	Total
	€ million	€ million	€ million	€ million
2019				
Sales (external) by market	5,289	3,141	3,982	12,412
Sales (external) by point of origin	5,239	3,209	3,964	12,412
2018				
Sales (external) by market	6,284	3,469	4,863	14,616
Sales (external) by point of origin	6,234	3,555	4,828	14,616

¹ No further presentation of interregional sales is provided, as these are neither reported separately to, nor do they influence the EBIT and EBITDA reported to the Board of Management of Covestro AG.

The following table provides a breakdown by countries of external sales by market and of property, plant and equipment as well as intangible assets:

Sales (external) by market and property, plant and equipment and intangible assets by country

	Sales (external) by market	Property, plant and equipment and intangible assets
	€ million	€ million
2019		
Germany	1,557	1,834
United States	2,604	1,298
China	2,456	1,429
Other	5,795	1,103
Total	12,412	5,664
2018		
Germany	1,783	1,361
United States	2,850	1,093
China	3,106	1,479
Other	6,877	809
Total	14,616	4,742

Information on major customers

Revenues from transactions with a single customer in no case exceeded 10% of Covestro Group sales in fiscal 2019 or the previous year.

Reconciliation

The following table shows the reconciliation of EBITDA of the segments to income before income taxes of the Group:

Reconciliation of segments' EBITDA to group income before income taxes

	2018	2019
	€ million	€ million
EBITDA of reportable segments	3,263	1,653
EBITDA of all other segments	9	13
EBITDA of Corporate Center	(72)	(62)
EBITDA	3,200	1,604
Depreciation, amortization, impairment losses and impairment loss reversals of reportable segments	(619)	(751)
Depreciation, amortization, impairment losses and impairment loss reversals of all other segments	(1)	(1)
Depreciation, amortization, impairment losses and impairment loss reversals	(620)	(752)
EBIT of reportable segments	2,644	902
EBIT of all other segments	8	12
EBIT of Corporate Center	(72)	(62)
EBIT	2,580	852
Financial result	(104)	(91)
Income before income taxes	2,476	761

5. Changes in the Scope of Consolidation

5.1 Scope of consolidation and investments

As of December 31, 2019, the scope of consolidation comprised Covestro AG and 47 (previous year: 49) consolidated companies.

OOO Covestro, Moscow (Russia), was reclassified as an immaterial subsidiary in the first quarter of 2019 for reasons including the fact that local production was halted. It has therefore no longer been consolidated since the first quarter of 2019.

Effective April 1, 2019, a further 30% of the shares in DIC Covestro Polymer Ltd., Tokyo (Japan) (DCP), was acquired, and the company was subsequently consolidated. Previously, it was classified as a joint venture and accounted for using the equity method in accordance with IAS 28 (Investments in Associates and Joint Ventures).

Pure Salt Baytown LLC, Houston (United States), previously consolidated as a structured entity, was reclassified as an immaterial associate in the third quarter of 2019 and subsequently deconsolidated. The foundations of the relationships with Pure Salt have changed contractually and economically in such a way that control no longer exists.

The sale of the European systems house business to H.I.G. Capital, Miami (United States), was closed in the fourth quarter of 2019. Consequently, the entities Covestro A/S, Otterup (Denmark), Covestro B.V., Foxhol (Netherlands), and Covestro Oldenburg GmbH & Co. KG, Oldenburg, were deconsolidated.

In the second half of 2019, Covestro Procurement Services GmbH & Co. KG, Leverkusen, and Covestro Intellectual Property GmbH & Co. KG, Leverkusen, were established and consolidated. Covestro Procurement Services GmbH & Co. KG was established for the purpose of securing the efficient procurement of strategically important raw materials for the Covestro Group and to provide consulting on procurement strategies. Covestro Intellectual Property GmbH & Co. KG will assume management of the patents, brands, licensing agreements and other intangible assets of Covestro Deutschland AG, Leverkusen.

The Covestro Group holds 100% of the voting rights in the fully consolidated subsidiary Pearl Covestro Polyurethane Systems L.L.C., Dubai (United Arab Emirates), pursuant to a contractual agreement with the noncontrolling stockholders.

As in the previous year, the scope of consolidation as of December 31, 2019, included the joint operation LyondellBasell Covestro Manufacturing Maasvlakte V.O.F., Rotterdam (Netherlands). Pursuant to IFRS 11 (Joint Arrangements), Covestro's shares of this company's assets, liabilities, revenues and expenses are included in the consolidated financial statements in accordance with Covestro's rights and obligations. The main purpose of LyondellBasell Covestro Manufacturing Maasvlakte V.O.F. is the joint production of propylene oxide (PO) for Covestro and its partner Lyondell.

Additionally, two associated companies (previous year: two associated companies and one joint venture) are accounted for in the consolidated financial statements using the equity method.

Seven (previous year: five) subsidiaries and two (previous year: one) associated companies that in aggregate are immaterial to the Covestro Group's net assets, financial position and results of operations are not consolidated but recognized at cost. The immaterial subsidiaries each accounted for no more than 0.1% of Group sales, equity or total assets.

The consolidated financial statements of Covestro are submitted to the operator of the Federal Gazette (Bundesanzeiger).

Details of subsidiaries and affiliated companies pursuant to Section 313 of the German Commercial Code (HGB) are shown in the following tables. The first table shows the following fully consolidated companies:

Fully consolidated companies

Company name	Place of business	Covestro's interest in %
EMLA		
Pearl Covestro Polyurethane Systems FZCO	Dubai (United Arab Emirates)	51
Pearl Covestro Polyurethane Systems L.L.C.	Dubai (United Arab Emirates)	49 ¹
Covestro (France) SNC	Fos-sur-Mer (France)	100
Covestro (Slovakia) Services s.r.o.	Bratislava (Slovakia)	100
Covestro (Tielt) NV	Tielt (Belgium)	100
Covestro Brunsbüttel Energie GmbH	Brunsbüttel (Germany)	100
Covestro Deutschland AG	Leverkusen (Germany)	100
Covestro Elastomers SAS	Romans-sur-Isère (France)	100
Covestro First Real Estate GmbH	Monheim (Germany)	100
Covestro GmbH	Leverkusen (Germany)	100
Covestro Indústria e Comércio de Polímeros Ltda.	São Paulo (Brazil)	100
Covestro Intellectual Property GmbH & Co. KG	Leverkusen (Germany)	100
Covestro International SA	Fribourg (Switzerland)	100
Covestro NV	Antwerp (Belgium)	100
Covestro Polyurethanes B.V.	Nieuwegein (Netherlands)	100
Covestro Procurement Services GmbH & Co. KG	Leverkusen (Germany)	100
Covestro S.p.A.	Milan (Italy)	99
Covestro S.r.l.	Filago (Italy)	100
Covestro Second Real Estate GmbH	Monheim (Germany)	100
Covestro Thermoplast Composite GmbH	Markt Bibart (Germany)	100
Covestro UK Limited	Cheadle (United Kingdom)	100
Covestro, S.L.	La Canonja (Spain)	100
Epurex Films GmbH & Co. KG	Walsrode (Germany)	100
MS Global AG	Köniz (Switzerland)	100
MS Holding B.V.	Nieuwegein (Netherlands)	100
NAFTA		
Covestro International Trade Services Corp.	Wilmington (United States)	100
Covestro LLC	Pittsburgh (United States)	100
Covestro PO LLC	New Martinsville (United States)	100
Covestro S.A. de C.V.	Mexico City (Mexico)	100
APAC		
Covestro (Hong Kong) Limited	Hong Kong (China)	100
Covestro (India) Private Limited	Thane (India)	100
Covestro (Shanghai) Management Co., Ltd.	Shanghai (China)	100
Covestro (Taiwan) Ltd.	Kaohsiung City (Taiwan)	95.5
Covestro (Thailand) Co., Ltd.	Bangkok (Thailand)	100
Covestro (Viet Nam) Company Limited	Ho Chi Minh City (Vietnam)	100
Covestro Far East (Hong Kong) Limited	Hong Kong (China)	100
Covestro Japan Ltd.	Tokyo (Japan)	100
Covestro Korea Corporation	Seoul (South Korea)	100
Covestro Polymers (China) Co., Ltd.	Shanghai (China)	100
Covestro Polymers (Qingdao) Co., Ltd.	Qingdao (China)	100
Covestro Polymers (Shenzhen) Co., Ltd.	Shenzhen (China)	100
Covestro Pty Ltd	Cheltenham (Australia)	100
DIC Covestro Polymer Ltd.	Tokyo (Japan)	80
Guangzhou Covestro Polymers Co., Ltd.	Guangzhou (China)	100
PT Covestro Polymers Indonesia	Jakarta (Indonesia)	99.9
Sumika Covestro Urethane Company, Ltd.	Amagasaki (Japan)	60

¹ Fully consolidated subsidiary pursuant to IFRS 10.B39

The following joint operation was included in the consolidated financial statements in line with Covestro's shares of its assets, liabilities, revenues and expenses:

Joint operation

Company name	Place of business	Covestro's interest in %
LyondellBasell Covestro Manufacturing Maasvlakte V.O.F	Rotterdam (Netherlands)	50

The following associated companies are accounted for in the consolidated financial statements using the equity method:

Associates accounted for using the equity method

Company name	Place of business	Covestro's interest in %
Paltough Industries (1998) Ltd.	Kibbutz Ramat Yochanan (Israel)	25
PO JV, LP	Wilmington (United States)	39.4

The following subsidiaries were reflected in the consolidated financial statements at amortized cost due to their immateriality:

Immaterial subsidiaries

Company name	Place of business	Covestro's interest in %
Asellion B.V.	Amsterdam (Netherlands)	100
Covestro Intellectual Property Verwaltungs GmbH	Leverkusen (Germany)	100
Covestro Polimer Anonim Şirketi	Istanbul (Turkey)	100
Covestro Polymers (Tianjin) Co., Ltd.	Tianjin (China)	100
Covestro Procurement Services Verwaltungs GmbH	Leverkusen (Germany)	100
Epurex Films Geschäftsführungs-GmbH	Walsrode (Germany)	100
OOO Covestro	Moscow (Russia)	100

The following associated company was accounted for in the consolidated financial statements at cost due to its immateriality:

Immaterial associate

Company name	Place of business	Covestro's interest in %
Pure Salt Baytown LLC	Houston (USA)	0
Technology JV, L.P.	Wilmington (United States)	33.3

The following domestic subsidiaries availed themselves in fiscal 2019 of certain exemptions granted under Section 264, Paragraph 3 or Section 264b of the German Commercial Code (HGB) regarding the preparation, auditing and publication of financial statements:

German exempt subsidiaries

Company name	Place of business	Covestro's interest in %
Covestro GmbH	Leverkusen (Germany)	100
Covestro Intellectual Property GmbH & Co. KG	Leverkusen (Germany)	100
Covestro Procurement Services GmbH & Co. KG	Leverkusen (Germany)	100
Epurex Films GmbH & Co. KG	Walsrode (Germany)	100

5.2 Acquisitions and divestitures

Acquisitions

Covestro increased its interest in DCP effective April 1, 2019, through a step acquisition of shares. DCP is a Japanese producer of thermoplastic polyurethanes, which are used, for example, in the automotive, IT, electronics, health care and sports sectors. By acquiring DCP, Covestro would like to exploit the future growth potential of the business in thermoplastic polyurethanes (TPU) in Japan. Covestro and DIC Corporation (DIC), Tokyo (Japan), previously operated this company as a joint venture in which each held a 50% interest. By acquiring a further 30% of the shares in DCP, Covestro increased its interest to 80% and thus gained control. As a result, DCP has been fully consolidated since April 1, 2019. The shares previously recognized using the equity method of accounting were remeasured at their fair value of €34 million. The remeasurement resulted in a gain of €19 million, which was recognized in other operating income. The noncontrolling interest corresponding to the remaining 20% of the shares held by DIC was determined proportionately from the net assets of DCP less goodwill. It amounted to €11 million and was recognized in equity.

The consideration transferred was €21 million and was settled by a cash transfer. The acquired net assets amounted to €66 million. The goodwill of €10 million included in the net assets reflects the anticipated sales synergies resulting from joint marketing of products over the relevant trading platforms. The goodwill is not tax deductible.

As of the date of acquisition, the above transaction had the following impact on the assets and liabilities of the Covestro Group in fiscal 2019 and led to the following cash outflow after adjustment for the cash and cash equivalents acquired:

Acquired assets and assumed liabilities (fair values at the acquisition date)

	2019
	€ million
Goodwill	10
Other intangible assets	29
Property, plant and equipment	14
Other financial assets	3
Inventories	12
Trade accounts receivable	11
Cash and cash equivalents	13
Deferred tax assets	1
Other provisions	(1)
Financial liabilities	(4)
Trade accounts payable	(9)
Other liabilities	(1)
Deferred tax liabilities	(12)
Net assets	66
Noncontrolling interest	(11)
Fair value of pre-existing interest	(34)
Consideration transferred	21
Acquired cash and cash equivalents	(13)
Net cash outflow for acquisitions	8

Before the acquisition, Covestro and DCP engaged in operational goods and services transactions, which were recognized by Covestro as trade accounts receivable of €1 million. These accounts were settled when DCP was acquired. In addition, DIC was granted a put option on the remaining 20% shares still held by DIC. If it exercises this put option, the sale of these remaining shares to Covestro would take effect in fiscal 2030. The put option is recognized in miscellaneous other financial liabilities while equity was reduced by the counter item recognized in retained earnings.

Since its consolidation as of April 1, 2019, DCP has contributed €31 million to sales and posted a loss of €1 million affecting the income after income taxes of the Covestro Group. Consolidation as of January 1, 2019 would have no significant impact on sales or income after income taxes of the reporting period of the Covestro Group.

Divestitures

In the third quarter of 2019, Covestro signed an agreement to divest the assets and liabilities (disposal group) of the European polycarbonate sheets business, belonging to the Polycarbonates segment, to the Serafin group, Munich (Germany). Polycarbonate sheets are extremely strong and are used primarily in the areas of industrial protection, construction systems and for advertising applications. The European polycarbonate sheets business comprises production sites in Belgium and Italy as well as central management and distribution functions in Europe. In connection with this divestiture, production-related assets and inventories amounting to €12 million and liabilities of €14 million were classified as "held for sale" in accordance with IFRS 5. Impairment losses on the assets of the disposal group resulted in a loss in the amount of €26 million, which is reported under the cost of goods sold, selling expenses and other operating expenses. This transaction should be completed in the first quarter of 2020 at the latest.

In the fourth quarter of 2019, Covestro completed the divestment of the assets and liabilities (disposal group) of the European systems house business, belonging to the Polyurethanes segment, to H.I.G. Capital, Miami (United States). The systems houses provide customers with tailored polyurethane systems. The European systems house business comprises systems houses in Denmark, Germany, Spain and the Netherlands, plus further activities in Italy. The fair value of the consideration transferred amounts to €74 million and comprises the cash transferred during the reporting period of €57 million, a contingent purchase price receivable of €9 million to be paid in fiscal 2022 (see note 24.1 "Financial instruments by category"), a deferred purchase price payments of €5 million also to be paid in fiscal 2022 and purchase price adjustments of €3 million. Within the scope of the sale, net assets of €38 million were transferred to the buyer. The gain on the disposal of this business totaling €34 million was recognized in other operating result.

Notes to the Income Statement

6. Sales

Sales are categorized according to "geographical regions and key countries," and mainly comprise sales from contracts with customers and an insignificant amount of rental and leasing sales. The table also contains a breakdown of sales by reportable segments.

Disaggregation of sales

	Polyure- thanes	Polycar- bonates	Coatings, Adhesives, Specialties	Other/ Consolidation		Covestro Group
				All other segments	Corporate Center and reconciliation	
	€ million	€ million	€ million	€ million	€ million	€ million
2019						
EMLA	2,487	1,146	1,052	604	–	5,289
of which Germany	471	271	448	367	–	1,557
NAFTA	1,680	734	562	165	–	3,141
of which United States	1,336	597	507	164	–	2,604
APAC	1,612	1,593	755	22	–	3,982
of which China	997	1,076	378	5	–	2,456
2018						
EMLA	3,182	1,347	1,117	638	–	6,284
of which Germany	564	340	489	390	–	1,783
NAFTA	1,947	817	519	186	–	3,469
of which United States	1,528	671	468	183	–	2,850
APAC	2,233	1,887	725	18	–	4,863
of which China	1,498	1,221	383	4	–	3,106

The following table presents the opening and closing balances of trade accounts receivable, contract assets, and contract liabilities:

Contract balances

	Jan. 1, 2018	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million	€ million
Trade accounts receivable	1,864	1,786	1,561
Contract assets	59	52	43
Contract liabilities	42	28	18

Contract assets are recognized in case the right to consideration in exchange for goods or services that have been transferred to a customer is conditional. This occurs primarily in the event of goods delivered to consignment warehouses of external customers. Contract assets are recognized as receivables upon invoicing.

Contract liabilities are recognized for advance payments received from customers prior to transferring goods or services. These contract liabilities are recognized as sales when the goods or services have been transferred.

Sales from performance obligations satisfied (or partially satisfied) in previous periods and recognized in fiscal 2019 amounted to €5 million (previous year: €2 million).

The changes in contract assets and contract liabilities in the reporting period resulted from the following circumstances:

Reconciliation of contract assets

	2018	2019
	€ million	€ million
Transfers from contract assets recognized at the beginning of the period to trade accounts receivable	(57)	(51)
Increases due to performance obligations fulfilled but not billed at the reporting date	48	39
Catch-up adjustments to revenue that affect the corresponding contract asset	2	3
Total	(7)	(9)

Reconciliation of contract liabilities

	2018	2019
	€ million	€ million
Revenue recognized that was included in the contract liability balance at the beginning of the period	(38)	(28)
Increases due to cash received, excluding amounts recognized as revenue during the period	28	18
Catch-up adjustments to revenue that affect the corresponding contract liability	(4)	–
Total	(14)	(10)

The following table provides the transaction price allocated to the remaining performance obligations as of balance sheet date. The total amount is divided according to the reporting period when it is expected to be recognized:

Transaction price allocated to the remaining performance obligations

	Dec. 31, 2018		Dec. 31, 2019
	€ million		€ million
2019	480	2020	448
2020	316	2021	386
2021	289	2022	426
2022	309	2023	283
2023	213	2024	182
2024 or later	116	2025 or later	83
Total	1,723	Total	1,808

The disclosures on the transaction price allocated to the remaining performance obligations is based on long-term supply contracts according to IFRS 15 (Revenue from Contract with Customers) which stipulate minimum volumes to be purchased as agreed between both parties.

Performance obligations from contracts with an original expected term of twelve months or less are excluded. Similarly, the disclosure of the transaction price excludes performance obligations satisfied over time for which Covestro has the right to consideration in an amount that corresponds directly with the value to the customer of the performance completed to date and for which Covestro may recognize revenue in the amount to which Covestro has the right to invoice.

The transaction price only includes variable consideration arising from contracts with customers, like sales- or volume-based rebates or price formulas, for which the prices are derived from external, market based indices, to the extent that they are not constrained as defined in IFRS 15.

7. Other Operating Income

Other operating income was comprised as shown in the following table:

Other operating income

	2018	2019
	€ million	€ million
Gains on retirements of noncurrent assets	54	6
Gains from derivatives	5	2
Reversals of impairment losses on receivables	5	7
Reversals of unutilized provisions	2	2
Miscellaneous operating income	57	164
Total	123	181

Gains from derivatives in fiscal years 2018 and 2019 resulted from embedded derivatives.

Miscellaneous operating income for the reporting period primarily included insurance reimbursements amounting to €63 million (previous year: €29 million) and €34 million from the sale of the European systems house business in the Polyurethanes segment to H.I.G. Capital, Miami (United States). Furthermore, shares in DIC Covestro Polymer Ltd., Tokyo (Japan), previously accounted for using the equity method, were remeasured at fair value in connection with the gradual share increase of the holding from 50% to 80%, resulting in income of €19 million.

See note 5.2 "Acquisitions and divestitures" for further information.

8. Other Operating Expenses

Other operating expenses were comprised as shown in the following table:

Other operating expenses

	2018	2019
	€ million	€ million
Losses on retirements of noncurrent assets	(9)	(7)
Impairment losses on receivables	(6)	(7)
Losses from derivatives	(4)	(5)
Miscellaneous operating expenses	(47)	(46)
Total	(66)	(65)

Losses from derivatives in fiscal years 2018 and 2019 resulted from embedded derivatives and currency hedges.

Miscellaneous operating expenses in fiscal 2019 included insurance expenses amounting to €13 million (previous year: €16 million). In fiscal years 2018 and 2019, the remaining amount consisted of numerous individually immaterial items.

9. Personnel Expenses and Employee Numbers

Personnel expenses in fiscal 2019 were comprised as shown in the following table:

Personnel expenses

	2018	2019
	€ million	€ million
Salaries	(1,610)	(1,388)
Social expenses and expenses for pensions and other benefits	(348)	(374)
of which for defined contribution pension plans	(88)	(96)
of which for defined benefit and other pension plans	(105)	(107)
Total	(1,958)	(1,762)

Personnel expenses decreased in fiscal 2019 primarily due to significantly lower expenses for short-term variable compensation under the Group-wide Covestro Profit Sharing Plan (Covestro PSP).

For further information on the components of Covestro PSP, see "Compensation Report" in the combined management report.

Average number of employees

	2018	2019
Production	10,348	10,955
Marketing and distribution	3,580	3,438
Research and development	1,104	1,210
General administration	1,575	1,539
Total	16,607	17,142
Employees in vocational training	482	515

The number of employees on either permanent or temporary contracts is stated in full-time equivalents (FTE). Part-time employees are included on a pro-rated basis in line with their contractual working hours. The figures do not include employees in vocational training.

10. Financial Result

10.1 Result from investments in affiliated companies

The result from investments in affiliated companies comprised mainly the loss of €23 million (previous year: loss of €25 million) from PO JV, LP, Wilmington, NC (USA), an associate accounted for using the equity method, and the gain of €1 million from Paltough Industries (1998) Ltd., Kibbuz Ramat Yochanan (Israel), accounted for using the equity method (previous year: €3 million from Paltough Industries (1998) Ltd. and DIC Covestro Polymer Ltd., Tokyo (Japan)). In addition, this item includes €2 million (previous year: €1 million) in dividend income from other investments. Further details of the companies accounted for using the equity method are given in note 15 "Investments Accounted for Using the Equity Method."

10.2 Net interest expense

Net interest expense was comprised as shown in the following table:

Net interest expense

	2018	2019
	€ million	€ million
Expenses		
Interest and similar expenses	(38)	(48)
Interest expenses for fx-derivatives	(44)	(37)
Income		
Interest and similar income	10	7
Interest income from fx-derivatives	25	33
Total	(47)	(45)

Interest and similar expenses primarily resulted from interest expenses from leases totaling €33 million (previous year: €14 million) and Covestro AG loans totaling €14 million (previous year: €14 million). Interest expense and interest income from forward exchange contracts included interest rate-induced fair value changes and the forward element.

10.3 Other financial result

The other financial result was comprised as shown in the following table:

Other financial result

	2018	2019
	€ million	€ million
Interest portion of interest-bearing provisions	(32)	(27)
Exchange gain/(loss)	–	5
Miscellaneous financial expenses	(4)	(4)
Total	(36)	(26)

The interest portion of interest-bearing provisions comprised €31 million (previous year: €25 million) in interest expense for pension and other post employment benefit provisions plus €4 million in effects of interest income (previous year: interest expense of €7 million) from interest rate fluctuations for other provisions and corresponding overfunding.

11. Taxes

The breakdown of tax expenses by type is shown in the table below:

Income taxes

	2018	2019
	€ million	€ million
Current taxes	(696)	(126)
of which tax expense current year	(677)	(174)
of which tax expense prior years	(19)	48
Deferred taxes	49	(78)
of which from temporary differences	51	(82)
of which from tax loss carryforwards and tax credits	(2)	4
Total	(647)	(204)

The deferred tax assets and liabilities were allocated to the items in the statements of financial position as shown in the table below:

Deferred tax assets and liabilities

	Dec. 31, 2018			Dec. 31, 2019		
	Deferred tax assets	Deferred tax liabilities	of which recognized in profit or loss	Deferred tax assets	Deferred tax liabilities	of which recognized in profit or loss
	€ million	€ million	€ million	€ million	€ million	€ million
Intangible assets	49	(19)	30	38	(15)	23
Property, plant and equipment ¹	144	(194)	(50)	129	(318)	(188)
Financial assets	–	(60)	(60)	1	(75)	(73)
Inventories	40	(2)	38	42	(1)	41
Receivables	4	(13)	(9)	17	(5)	12
Provisions for pensions and other post-employment benefits	530	(27)	(21)	632	(23)	(12)
Other provisions	91	(21)	70	39	(18)	22
Liabilities ¹	105	(2)	101	195	(1)	194
Tax loss carryforwards	4	–	4	8	–	8
Total	967	(338)	103	1,101	(456)	25
of which noncurrent	881	(301)		1,002	(415)	
Offsetting	(185)	185		(250)	250	
Recognition	782	(153)		851	(206)	

¹ The figures as of December 31, 2019, include right-of-use assets and lease liabilities from initial application of IFRS 16.

Of the total tax loss carryforwards of €42 million (previous year: €17 million), an amount of €42 million (previous year: €16 million) is expected to be usable within a foreseeable period. The increase in loss carryforwards was mainly due to the growth of tax loss carryforwards in the reporting year and tax reassessments for prior years. Deferred tax assets of €8 million (previous year: €4 million) were recognized for the amount of loss carryforwards expected to be usable.

No use of tax loss carryforwards was subject to legal or economic restrictions with regard to its usability (previous year: €1 million). Consequently, no deferred tax assets were recognized for this amount.

No material tax credits were recorded in either the reporting year or the prior year.

Unusable tax loss carryforwards will expire as shown in the table below:

Expiration of unusable tax loss carryforwards

	Tax loss carryforwards	
	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million
Within one year	–	–
Within two years	–	–
Within three years	–	–
Within four years	–	–
Within five years	–	–
Thereafter	1	–
Total	1	–

In fiscal 2019, subsidiaries that reported losses for the reporting year or the previous year recognized net deferred tax assets totaling €627 million (previous year: €7 million) from temporary differences and tax loss carryforwards, of which €5 million (previous year: €1 million) were recognized from tax loss carryforwards. These assets were considered to be unimpaired because the companies concerned were expected to generate taxable income in the future.

In the reporting year, deferred tax liabilities of €31 million (previous year: €21 million) were recognized for planned dividend distributions by subsidiaries. No deferred tax liabilities were recognized for temporary differences of €48 million (previous year: €71 million) relating to shares in subsidiaries, as it is unlikely that these temporary differences will reverse in the foreseeable future.

The reported tax expense of €204 million (previous year: €647 million) for fiscal 2019 was €15 million higher (previous year: €56 million) than the expected tax expense of €189 million (previous year: €591 million) that would have resulted from applying an expected weighted average tax rate to the pre-tax income of the Covestro Group. This average tax rate was derived from the expected tax rates of the individual Group companies and amounted to 24.8% in fiscal 2019 (previous year: 23.9%). The effective tax rate was 26.8% (previous year: 26.1%).

The reconciliation of expected to actual income tax expense and of the expected to the effective tax rate for the Covestro Group is shown in the following table:

Reconciliation of expected to actual income tax expense

	2018		2019	
	€ million	%	€ million	%
Expected income tax expense and expected tax rate	591	+23.9	189	+24.8
Reduction in taxes due to tax-free income	(21)	–0.8	(33)	–4.3
Increase in taxes due to non-tax-deductible expenses	58	+2.2	47	+6.1
Tax income (–) and expenses (+) relating to other periods	–	–	(19)	–2.5
Tax effects of change in tax rates	(1)	–	5	+0.7
Other tax effects	20	+0.8	15	+2.0
Actual income tax expense and effective tax rate	647	+26.1	204	+26.8

12. Earnings per Share

Earnings per share are calculated according to IAS 33 (Earnings per Share) as the relationship of the Group's income after income taxes (net income) for the fiscal year to the weighted average number of outstanding no-par voting shares of Covestro AG. Since November 21, 2017, Covestro AG has been acquiring treasury shares as part of a share buy-back program, which was terminated on December 4, 2018. In fiscal 2019, a weighted average number of outstanding no-par voting shares of 182,728,724 was used to calculate earnings per share, while in fiscal 2018, these shares amounted to 192,768,826.

Earnings per share

	2018	2019
	€ million	€ million
Income after income taxes	1,829	557
of which attributable to noncontrolling interest	6	5
of which attributable to Covestro AG stockholders (net income)	1,823	552
	Shares	Shares
Weighted average number of outstanding no-par voting shares of Covestro AG	192,768,826	182,728,724
	€	€
Basic earnings per share	9.46	3.02
Diluted earnings per share	9.46	3.02

Notes to the Statement of Financial Position

13. Goodwill and Other Intangible Assets

Changes in intangible assets in 2019

	Acquired goodwill	Patents and technologies	Marketing and distribution rights	Production rights	Software	Other rights	Advance payments	Total
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Cost of acquisition or generation, December 31, 2018	256	28	105	97	157	176	15	834
Acquisitions	10	–	–	–	–	29	–	39
Capital expenditures	–	–	–	–	2	1	23	26
Retirements	–	–	–	–	(2)	–	–	(2)
Transfers	–	–	1	–	1	–	(2)	–
Transfers (IFRS 5)	(3)	–	(14)	(8)	(4)	–	–	(29)
Exchange differences	2	–	–	1	2	(1)	–	4
Cost of acquisition or generation, December 31, 2019	265	28	92	90	156	205	36	872
Accumulated amortization, impairment losses and impairment loss reversals, December 31, 2019	1	14	78	86	147	168	–	494
Carrying amounts, December 31, 2019	264	14	14	4	9	37	36	378
Amortization and impairment losses in 2019	1	1	7	2	5	4	–	20
Amortization	–	1	7	2	5	4	–	19
Impairment losses	1	–	–	–	–	–	–	1

The impairment losses amounted to €1 million (previous year: €0 million) in the reporting year. No reversals of impairment losses were recognized either in the reporting period or in the reference period.

The impairment testing procedure for goodwill and other intangible assets is explained under “Procedure used in global impairment testing and its impact” in note 3 “Accounting Policies and Valuation Principles.”

Changes in intangible assets in 2018

	Acquired goodwill	Patents and technologies	Marketing and distribution rights	Production rights	Software	Other rights	Advance payments	Total
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Cost of acquisition or generation, December 31, 2017	253	30	105	96	147	176	9	816
Capital expenditures	–	–	–	–	3	1	12	16
Retirements	–	–	–	–	(1)	(1)	–	(2)
Transfers	–	–	–	–	6	–	(6)	–
Transfers (IFRS 5)	(1)	(2)	–	–	–	(1)	–	(4)
Exchange differences	4	–	–	1	2	1	–	8
Cost of acquisition or generation, December 31, 2018	256	28	105	97	157	176	15	834
Accumulated amortization, impairment losses and impairment loss reversals, December 31, 2018	–	13	85	92	147	164	–	501
Carrying amounts, December 31, 2018	256	15	20	5	10	12	15	333
Amortization and impairment losses in 2018	–	1	7	2	9	2	–	21
Amortization	–	1	7	2	9	2	–	21

Goodwill that is of material significance for the Covestro Group was allocated to the following cash-generating units at the end of the reporting period:

Material goodwill by cash-generating unit

Reporting segment	Cash-generating unit	Dec. 31, 2018	Dec. 31, 2019
		€ million	€ million
Polyurethanes (PUR)	MDI	61	60
Polyurethanes (PUR)	Polyether polyol	23	22
Polycarbonates (PCS)	PCS	121	121
Coatings, Adhesives, Specialties (CAS)	BMI	38	48
Coatings, Adhesives, Specialties (CAS)	Resins	10	10

The increase of €10 million in the goodwill of the cash-generating unit BMI is attributable to the acquisition of DIC Covestro Polymer Ltd., Tokyo (Japan).

14. Property, Plant and Equipment

Changes in property, plant and equipment in 2019

	Land and buildings	Plant installations and machinery	Furniture, fixtures and other equipment	Construction in progress and advance payments	Total
	€ million	€ million	€ million	€ million	€ million
Cost of acquisition or construction, December 31, 2018	3,098	11,486	533	850	15,967
Changes in scope of consolidation	–	(73)	–	–	(73)
Initial application IFRS 16	268	154	238	–	660
Acquisitions	5	7	1	2	15
Capital expenditures	63	165	56	698	982
Retirements	(46)	(253)	(75)	–	(374)
Transfers	28	321	17	(366)	–
Transfers (IFRS 5)	(39)	(81)	(11)	(1)	(132)
Exchange differences	50	130	7	5	192
Cost of acquisition or construction, December 31, 2019	3,427	11,856	766	1,188	17,237
Accumulated depreciation, impairment losses and impairment loss reversals, December 31, 2019	2,026	9,425	500	–	11,951
Carrying amounts, December 31, 2019	1,401	2,431	266	1,188	5,286
Depreciation and impairment losses in 2019	149	499	84	1	733
Depreciation	138	485	83	–	706
Impairment losses	11	14	1	1	27
Impairment loss reversals in 2019	–	(1)	–	–	(1)

The deconsolidation of Pure Salt Baytown LLC, Houston (United States), resulted in a decrease in the historical cost of acquisition or construction of plant installations and machinery due to changes in the scope of consolidation amounting to €73 million, a corresponding derecognition of accumulated depreciation of €65 million and the carrying amount of €8 million. Initial application of IFRS 16 resulted in an increase in cost of acquisition or construction in property, plant and equipment. See note 2.1 "Financial reporting standards applied for the first time in the reporting period" for effects of initial application.

Impairment losses of €1 million were reversed for property, plant, and equipment in the reporting year (previous year: €0 million).

Changes in property, plant and equipment in 2018

	Land and buildings	Plant installations and machinery	Furniture, fixtures and other equipment	Construction in progress and advance payments	Total
	€ million	€ million	€ million	€ million	€ million
Cost of acquisition or construction, December 31, 2017	3,186	11,166	509	517	15,378
Capital expenditures	10	118	26	543	697
Retirements	(153)	(78)	(13)	–	(244)
Transfers	34	175	9	(218)	–
Transfers (IFRS 5)	(12)	(45)	–	–	(57)
Exchange differences	33	150	2	8	193
Cost of acquisition or construction, December 31, 2018	3,098	11,486	533	850	15,967
Accumulated depreciation, impairment losses and impairment loss reversals, December 31, 2018	1,904	9,207	447	–	11,558
Carrying amounts, December 31, 2018	1,194	2,279	86	850	4,409
Depreciation and impairment losses in 2018	95	471	33	–	599
Depreciation	92	467	33	–	592
Impairment losses	3	4	–	–	7

Borrowing costs of €6 million were capitalized in property, plant, and equipment in the reporting year as part of the cost of qualifying assets (previous year: €4 million). The capitalization rate applied amounted to 1.4% on average (previous year: 1.4%).

14.1 Leasing

Covestro as lessee

The right-of-use assets from leases are reported in capitalized property, plant and equipment.

The following table shows the changes in carrying amounts of right-of-use assets from January 1, 2019, to December 31, 2019.

Changes in right-of-use assets in 2019

	Land and buildings	Plant installations and machinery	Furniture, fixtures and other equipment	Total
	€ million	€ million	€ million	€ million
Carrying amounts, January 1, 2019	351	288	239	878
Additions	43	12	36	91
Retirements	(22)	(1)	(50)	(73)
Depreciation and impairment losses	(53)	(53)	(51)	(157)
Other changes	10	4	4	18
Carrying amounts, December 31, 2019	329	250	178	757

Right-of-use assets relate mainly to leases for production and logistics infrastructure and real estate leases. Some of the underlying leases include variable lease payments as well as options to extend or terminate the lease (for further details, see note 3 "Accounting Policies and Valuation Principles"). Leases for production and logistics infrastructure are mainly related to the rental of tanks and containers as well as rail cars. For tanks and containers, the average lease term is 14 years and for rail cars, nine years. Leases for renting real estate, particularly buildings, are for an average lease term of nine years.

The following table shows the amounts for all leases shown in the statement of cash flows and income statement:

Expenses and cash outflows for leases

	2019
	€ million
Amounts reported in the statement of cash flows	
Total cash outflow for leases	196
Amounts reported in the income statement	
Depreciation and impairment losses	157
Interest expense	33
Expenses relating to short-term leases	16
Expenses relating to leases of low-value assets	3
Expenses relating to variable lease payments not included in the lease liability	1

The lease commitments for current leases not recognized on the balance sheet amount to €2 million.

For information on the liabilities arising from leases, see note 22 "Financing and Financial Liabilities." For further details on payments from leases, see note 27 "Notes to the Statement of Cash Flows."

Covestro as lessor

In fiscal 2019, leasing income generated from lease contracts under IFRS 16 (Leases) was €12 million. These are mainly related to real estate. In addition, lease payments from rentals of €8 million are expected to be received in the following year, not including the investment property as outlined below. Lease payments totaling €8 million are expected to be received in 2021–2024, and lease payments totaling €5 million after 2024.

At Covestro, risks from renting real estate are usually limited by building insurance policies and by the contractual obligation of the renter to return the real estate to its original condition. In addition, price adjustments based mainly on the consumer price index mechanisms are contractually agreed.

14.2 Investment property

Internal valuations are used as the primary basis for determining the fair values of investment property. The income approach is used for buildings and developed sites, and the market comparison approach is used for undeveloped sites.

The total carrying amount of investment property as of December 31, 2019, amounted to €31 million (previous year: €36 million), and its fair value totaled €211 million (previous year: €211 million). The rental income from investment property was €17 million (previous year: €26 million) and the operating expenses directly allocable to this property amounted to €14 million (previous year: €13 million). In the reporting period and in the previous year, there were no operating expenses recognized for investment property not generating any rental income.

Rental income generated from the leasing of properties classified as investment properties stemmed in part from contracts for hereditary building rights and leases granted by the Covestro Group. These contracts with a weighted average remaining term of 37 years relate to space used by companies and contractual partners in the chemical industry at production sites in Germany. Based on current rental prices, around €5 million in compensation will be received annually from these long-term contracts for the use of this space in the coming years.

15. Investments Accounted for Using the Equity Method

An overview of the investments accounted for using the equity method can be found in note 5.1 "Investments Accounted for Using the Equity Method." The two following tables contain summarized data from the income statement and statement of financial position of the associate PO JV, LP, Wilmington (United States), which is accounted for using the equity method, and show the respective amounts recognized in the financial statements of the Covestro Group.

In fiscal 2000, the polyols business and parts of the propylene oxide (PO) production operations of Lyondell Chemicals were acquired with the objective of ensuring access to patented technologies and safeguarding the long-term supply of PO, a starting product for polyurethanes. As part of this strategy, a company was established to jointly produce PO (PO JV, LP, in which Covestro continues to hold a 39.4% interest). Covestro benefits from fixed long-term supply quotas/volumes of PO from this company's production.

Income statement data of PO JV, LP, Wilmington (United States)

	2018	2019
	€ million	€ million
Sales	2,078	1,413
Net loss after taxes	(54)	(59)
Share of net loss after taxes	(25)	(23)
Share of total comprehensive income after taxes	(25)	(23)

Data from the statements of financial position of PO JV, LP, Wilmington (United States)

	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million
Noncurrent assets	399	436
Equity	415	436
Share of equity	189	185
Other	(9)	(15)
Carrying amount	180	170

The item "Other" mainly comprised differences arising from adjustments of data to Covestro's uniform accounting policies, purchase price allocations and their subsequent measurement.

The following table contains the income statement data and the carrying amount of the other associates accounted for using the equity method:

Income statement data and carrying amounts of other investments accounted for using the equity method

	2018	2019
	€ million	€ million
Income after taxes	8	5
Share of income after taxes	3	1
Share of total comprehensive income after taxes	3	1
Carrying amount	34	22

16. Other Financial Assets

The other financial assets were comprised as follows:

Other financial assets

	Dec. 31, 2018		Dec. 31, 2019	
	Total	Of which current	Total	Of which current
	€ million	€ million	€ million	€ million
Loans	12	2	16	11
Other investments	7	–	13	–
Receivables from derivatives	20	14	22	16
Receivables under lease agreements	9	1	8	–
Total	48	17	59	27

Receivables from derivatives included €15 million (previous year: €12 million) in forward exchange contracts and €7 million (previous year: €8 million) in embedded derivatives. Further information is given in note 24.2 "Financial risk management and information on derivatives."

Receivables under lease agreements relate to finance leases where Covestro is the lessor and the economic owner of the leased assets is the contractual partner. Receivables under lease agreements are based on expected lease payments of €34 million (previous year: €35 million) including an interest component of €26 million (previous year: €26 million). In the reporting period, interest income of €1 million (previous year: €1 million) was recognized. Of the expected lease payments, €1 million is due within one year (previous year: €1 million), €3 million is due within the following four years (previous year: €3 million) and €30 million is due in subsequent years (previous year: €31 million).

17. Inventories

Inventories were comprised as follows:

Inventories

	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million
Raw materials and supplies	660	592
Work in process, finished goods and goods purchased for resale ¹	1,551	1,323
Advance payments	2	1
Total	2,213	1,916

¹ In fiscal 2019, the share of work in process comprises approximately 19% (previous year: approximately 19%).

In fiscal 2019, impairment losses on inventories of €32 million (previous year: €18 million) and reversals of impairment losses of €9 million (previous year: €3 million) were recognized through profit or loss in cost of goods sold.

18. Other Receivables

The other receivables were comprised as follows:

Other receivables

	Dec. 31, 2018		Dec. 31, 2019	
	Total	Of which current	Total	Of which current
	€ million	€ million	€ million	€ million
Other tax receivables	174	166	197	175
Deferred charges	74	70	75	70
Contract Assets	52	52	43	43
Net defined benefit asset	1	–	2	–
Receivables from employees	6	6	9	9
Receivables from divestments	–	–	17	3
Miscellaneous receivables	71	52	68	59
Total	378	346	411	359

The miscellaneous receivables included an advance payment in the amount of €7 million (previous year: €12 million), which is offset against monthly purchases. Other receivables included €41 million (previous year: €35 million) in financial receivables. The impairment losses calculated for financial receivables as of the reporting date are immaterial.

Further information on contract assets is given in note 6 “Sales.”

19. Equity

The individual components of equity and changes in equity in 2018 and 2019 are presented in the Covestro Group consolidated statement of changes in equity.

Capital stock

The capital stock of Covestro AG changed as follows in 2019:

Change in capital stock

	Number of shares	thereof Treasury shares	Shares outstanding	Capital stock
	number	number	number	€ million
Dec. 31, 2018	183,000,000	(295,398)	182,704,602	183
Issuance of treasury shares		160,083	160,083	–
Dec. 31, 2019	183,000,000	(135,315)	182,864,685	183

The Covestro AG's capital stock as of December 31, 2019 is divided into 183,000,000 no-par value bearer shares and is fully paid up. Each share confers the right to one vote.

Treasury shares

160,083 treasury shares were issued to employees of the German legal entities under the Covestment stock participation program. As of December 31, 2019, the company held 135,315 treasury shares. This corresponds to 0.1% of the capital stock.

The total cost of the treasury shares held by Covestro AG at the end of the fiscal year was €7 million. They are valued using the FIFO method. The average price per share for the entire share buy-back program was €72.91 per share.

Authorized and Conditional Capital

The authorized capital and conditional capital as of December 31, 2019, were comprised as follows:

Authorized and conditional capital

	€ million	Purpose
Authorized capital 2015 ¹	101	Increase in capital stock against cash contributions and/or contributions in kind (by October 2, 2020)
Conditional capital 2015 ¹	1,500	Issue of warrants or conversion rights (by August 31, 2020)

¹ Requires Supervisory Board approval

Neither the authorized capital nor the conditional capital has been utilized to date.

Capital reserves

Covestro AG's capital reserves as of December 31, 2019, amounted to €3,487 million (previous year: €3,480 million). The increase is attributable to the issuance of treasury shares to employees under the Covestment stock participation program.

Dividend

The dividend available for distribution is based on the distributable profit reported in the annual financial statements of Covestro AG, which were prepared according to the provision of the German Commercial Code (HGB). The dividend proposed for fiscal 2019 amounts to €2.40 per share carrying dividend rights for a total distribution of €439 million based on the number of shares carrying dividend rights as of December 31, 2019, and depends on authorization by the stockholders at the Annual General Meeting. It is therefore not recognized as a liability in the consolidated financial statements. For fiscal 2018, a dividend of €2.40 per share carrying dividend rights was paid likewise in April 2019.

Equity attributable to noncontrolling interest

The equity attributable to noncontrolling interest mainly relates to the equity of Pearl Covestro Polyurethane Systems FZCO, Dubai (United Arab Emirates), Sumika Covestro Urethane Company, Ltd., Amagasaki (Japan), DIC Covestro Polymer Ltd., Tokyo (Japan), and Covestro (Taiwan) Ltd., Kaohsiung City (Taiwan).

The changes in equity attributable to noncontrolling interest are presented in the following table:

Components of noncontrolling interest in equity

	2018	2019
	€ million	€ million
January 1	30	33
Change in equity not recognized in profit or loss		
Exchange differences on translation of operations outside the eurozone	2	1
Other changes in equity	–	11
Dividend payments	(5)	(3)
Change in equity recognized in profit or loss	6	5
December 31	33	47

Accumulated other comprehensive income

Accumulated other comprehensive income were comprised as follows:

Accumulated other comprehensive income

	Currency translation	Fair value of financial assets	Total
	€ million	€ million	€ million
Dec. 31, 2017¹	253	1	254
Changes in accounting for initial application of new IFRS		(1)	(1)
Jan. 1, 2018 adjusted	253	–	253
Other comprehensive income	70	–	70
Total comprehensive income	70	–	70
Dec. 31, 2018	323	–	323
Other comprehensive income	92	–	92
Total comprehensive income	92	–	92
Dec. 31, 2019	415	–	415

¹ Reference information was not restated for financial reporting standards IFRS 9 and IFRS 15.

² Reference information was not restated, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

20. Provisions for Pensions and Other Post-employment Benefits

Provisions for pensions and other post-employment benefits were recognized for defined benefit obligations. The expenses for defined contribution obligations are shown in note 9 "Personnel Expenses and Employee Numbers." The net defined benefit liability for post-employment benefit plans was accounted for as follows:

Net defined benefit liability reflected in the statement of financial position

	Pensions		Other post-employment benefits		Total	
	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million	€ million	€ million	€ million	€ million
Provisions for pensions and other post-employment benefits	1,317	1,818	128	147	1,445	1,965
of which Germany	1,189	1,699	–	–	1,189	1,699
of which other countries	128	119	128	147	256	266
Net defined benefit asset	1	2	–	–	1	2
of which Germany	1	2	–	–	1	2
of which other countries	–	–	–	–	–	–
Net defined benefit liability	1,316	1,816	128	147	1,444	1,963
of which Germany	1,188	1,697	–	–	1,188	1,697
of which other countries	128	119	128	147	256	266

The expenses for defined benefit plans and for other post-employment benefits included the components described as follows:

Expenses for defined benefit plans

	Pension plans						Other post-employment benefit plans	
	Germany		Other countries		Total		Other countries	
	2018	2019	2018	2019	2018	2019	2018	2019
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Current service cost	81	83	15	15	96	98	2	2
Past service cost	7	16	–	–	7	16	–	–
Plan settlements	–	–	–	(9)	–	(9)	–	–
Service cost	88	99	15	6	103	105	2	2
Interest expense from defined benefit obligation	60	61	21	24	81	85	5	5
Interest income from plan assets	(43)	(40)	(18)	(20)	(61)	(60)	–	–
Net interest	17	21	3	4	20	25	5	5
Total expenses	105	120	18	10	123	130	7	7

In fiscal 2019, a total of €439 million (previous year: €198 million) in effects of remeasurements of the net defined benefit liability was also recognized in other comprehensive income. Of this amount, €427 million (previous year: €220 million) relate to pension obligations and €12 million (previous year: minus €22 million) to other post-employment benefit obligations.

The changes in the net defined benefit liability for post-employment benefit plans were as follows:

Changes in defined benefit obligation

	2018			2019		
	Germany	Other countries	Total	Germany	Other countries	Total
	€ million	€ million	€ million	€ million	€ million	€ million
January 1	3,172	835	4,007	3,390	825	4,215
Divestments	–	–	–	(4)	–	(4)
Current service cost	81	17	98	83	17	100
Past service cost	7	–	7	16	–	16
(Gains)/losses from plan settlements	–	–	–	–	(9)	(9)
Net interest	60	26	86	61	30	91
Net actuarial (gain)/loss	109	(43)	66	647	85	732
of which due to change in financial assumptions	63	(49)	14	644	92	736
of which due to change in demographic assumptions	42	(11)	31	–	(4)	(4)
of which due to experience adjustments	4	17	21	1	(1)	–
Employee contributions	9	1	10	9	1	10
Payments due to plan settlements	–	–	–	–	(1)	(1)
Benefits paid out of plan assets	(24)	(45)	(69)	(21)	(166)	(187)
Benefits paid by the company	(24)	(7)	(31)	(27)	(10)	(37)
Exchange differences	–	41	41	–	18	18
December 31	3,390	825	4,215	4,154	790	4,944
of which other post-employment benefits	–	129	129	–	148	148

Changes in fair value of plan assets

	2018			2019		
	Germany	Other countries	Total	Germany	Other countries	Total
	€ million	€ million	€ million	€ million	€ million	€ million
January 1	2,233	592	2,825	2,202	571	2,773
Divestments	–	–	–	–	–	–
Net interest	43	18	61	40	20	60
Adjustment of estimation techniques	–	–	–	–	–	–
Return or (expense) on plan assets excluding amounts recognized as interest result	(100)	(33)	(133)	210	83	293
Employer contributions	41	8	49	17	9	26
Employee contributions	9	1	10	9	1	10
Payments due to plan settlements	–	–	–	–	(1)	(1)
Benefits paid out of plan assets	(23)	(45)	(68)	(21)	(166)	(187)
Plan administration cost paid out of plan assets	(1)	–	(1)	–	–	–
Exchange differences	–	30	30	–	9	9
December 31	2,202	571	2,773	2,457	526	2,983
of which other post-employment benefits	–	1	1	–	1	1

Effects of the asset ceiling

	2018			2019		
	Germany	Other countries	Total	Germany	Other countries	Total
	€ million	€ million	€ million	€ million	€ million	€ million
January 1	–	3	3	–	2	2
Remeasurement of asset ceiling	–	(1)	(1)	–	–	–
December 31	–	2	2	–	2	2
of which other post-employment benefits	–	–	–	–	–	–

Development of the net defined benefit liability

	2018			2019		
	Germany	Other countries	Total	Germany	Other countries	Total
	€ million	€ million	€ million	€ million	€ million	€ million
January 1	939	246	1,185	1,188	256	1,444
Divestments	–	–	–	(4)	–	(4)
Current service cost	81	17	98	83	17	100
Past service cost	7	–	7	16	–	16
(Gains) / losses from plan settlements	–	–	–	–	(9)	(9)
Net interest	17	8	25	21	10	31
Net actuarial (gain) / loss	109	(43)	66	647	85	732
Change in estimation technique	–	–	–	–	–	–
(Return) or expense on plan assets excluding amounts recognized as interest result	100	33	133	(210)	(83)	(293)
Remeasurement of asset ceiling	–	(1)	(1)	–	–	–
Employer contributions	(41)	(8)	(49)	(17)	(9)	(26)
Employee contributions	–	–	–	–	–	–
Payments due to plan settlements	–	–	–	–	–	–
Benefits paid out of plan assets	(1)	–	(1)	–	–	–
Benefits paid by the company	(24)	(7)	(31)	(27)	(10)	(37)
Plan administration cost paid out of plan assets	1	–	1	–	–	–
Exchange differences	–	11	11	–	9	9
December 31	1,188	256	1,444	1,697	266	1,963
of which other post-employment benefits	–	128	128	–	147	147

The benefit obligations pertained mainly to Germany (84%; previous year: 80%) and the United States (12%; previous year: 15%). In Germany, current employees accounted for about 63% (previous year: 62%) of entitlements under defined benefit plans, retirees or their surviving dependents for about 29% (previous year: 31%), and former employees with vested pension rights for about 8% (previous year: 7%). In the United States, current employees accounted for about 40% (previous year: 36%) of entitlements under defined benefit plans, retirees or their surviving dependents for about 53% (previous year: 60%), and former employees with vested pension rights for about 7% (previous year: 4%).

The actual income from assets of defined benefit plans for pensions or other post-employment benefits amounted to €353 million (previous year: expense of €72 million) and €0 million (previous year: €0 million), respectively.

The following table shows the defined benefit obligations for pensions and other post-employment benefits along with the funded status of the funded obligations:

Defined benefit obligation and funded status

	Pension obligations		Other post-employment benefit obligations		Total	
	2018	2019	2018	2019	2018	2019
	€ million	€ million	€ million	€ million	€ million	€ million
Defined benefit obligation	4,085	4,796	129	148	4,214	4,944
of which unfunded	77	89	1	–	78	89
of which funded	4,008	4,707	128	148	4,136	4,855
Funded status of funded obligations						
Overfunding	2	2	–	–	2	2
Underfunding	1,238	1,727	127	147	1,365	1,874

Pension entitlements and other post-employment benefit obligations

The Covestro Group provides retirement benefits for most of its employees, either directly or by contributing to privately or publicly administered funds. The way these benefits are provided varies according to the legal, tax and economic conditions of each country, the benefits generally being based on employee compensation and years of service. The obligations relate both to existing retirees' pensions and to pension entitlements of future retirees.

Funded pension plans exist for employees in various countries. In principle, an individual investment strategy is determined for each of the Covestro Group's defined benefit pension plans taking into account the risk structure of the obligations (especially demographics, the current funded status, the structure of the expected future cash flows, interest sensitivity, biometric risks, etc.), the regulatory environment and the existing level of risk tolerance or risk capacity. A strategic target investment portfolio is then developed in line with the plan's risk structure, taking capital market factors into consideration. Further determinants are risk diversification, portfolio efficiency and the need for both a country-specific and a global risk/return profile centered on ensuring the payment of all future benefits. In principle, as the capital investment strategy for each pension plan is developed individually in light of the plan-specific conditions listed above, the investment strategies for different pension plans may vary considerably. The investment strategies are generally aligned less toward maximizing absolute returns and more toward the reasonable assurance of financing pension commitments over the long term. For plan assets, stress scenarios are simulated and other risk analyses (such as value at risk) are undertaken with the aid of risk management systems.

Bayer-Pensionskasse VVaG, Leverkusen (Germany), (Bayer-Pensionskasse), is by far the most significant of the pension plans for Covestro. It has been closed to new members since January 1, 2005. This legally independent fund is regarded as a life insurance company and is therefore subject to the German Insurance Supervision Act. The benefit obligations covered by Bayer-Pensionskasse comprise retirement, surviving dependents' and disability pensions. It is financed with contributions by the active members and by their employers. The company contribution is a certain percentage of the employee contribution. This percentage is the same for all participating employers and is set by agreement between the plan's executive committee and supervisory board, acting on a proposal from the responsible actuary. It takes into account the differences between the actuarial estimates and the actual values for the factors used to determine liabilities and contributions. Bayer AG may adjust the company contribution in agreement with the plan's executive committee and supervisory board, acting on a proposal from the responsible actuary. The plan's liability is governed by Section 1, Paragraph 1, Sentence 3 of the German Law on the Improvement of Occupational Pensions (BetrAVG). This means that if the pension plan exercises its right under the articles of association to reduce benefits, each participating employer has to make up the resulting difference. Covestro is not liable for the obligations of other participating employers, even if they cease to participate in the plan.

Pension entitlements for people hired in Germany on or after January 1, 2005, are granted via Rheinische Pensionskasse VVaG, Leverkusen (Germany), (Rheinische Pensionskasse). Future pension payments from this plan are based among other things on contributions and the return on plan assets; a guaranteed interest rate applies.

The Bayer-Pensionskasse and Rheinische Pensionskasse pension obligations are classified as multi-employer plans as defined by IAS 19 (Employee Benefits). A defining characteristic of multi-employer plans is that assets from various employers not under common control are pooled at plan level and used to collectively grant pension benefits to employees. Allocation mechanisms that would permit an exact distribution of the plan assets managed by the pension plan to individual employers often do not exist, as in the case of Bayer-Pensionskasse and Rheinische Pensionskasse. Covestro therefore applies an estimation method that is adequately suited to this purpose to calculate its proportional share of the assets of the pension plans.

Another important pension provision vehicle is Metzler Trust e.V., Frankfurt am Main (Germany), (Metzler Trust). This vehicle covers further retirement provision arrangements for German employees of the Covestro Group, such as the conversion of salary entitlements into pension entitlements, pension obligations and components of other direct commitments.

The defined benefit pension plans in the U.S. have been frozen for some years, and no significant new entitlements can be earned under these plans. The assets of all the United States pension plans are held by a master trust for reasons of efficiency. The applicable regulatory framework is based on the Employee Retirement Income Security Act (ERISA). In particular, these stipulate a statutory 80% minimum funding requirement to avoid benefit restrictions. The actuarial risks, such as investment risk, interest rate risk and longevity risk, remain with the company.

The investment strategy for German direct commitments revised in fiscal 2017 was further implemented in fiscal 2019. The changes in the investment strategy were subsequently carried out by third-party asset managers. Environmental social governance (ESG) criteria were given consideration for around 47% of the investment volume.

The risk management concept aligned with the benefit obligations (asset-liability matching) was revised for the U.S. defined benefit pension plan again in fiscal 2019. First, the actuarial obligations were analyzed and updated. Then statistical methods were applied to this information to determine an investment strategy that would ensure a suitable risk-return profile. The factors considered here included expected returns for the various asset classes and anticipated balance sheet volatility. In addition, certain benefit obligations and plan assets were transferred to an insurance company in order to further reduce actuarial risks for Covestro.

The other post-employment benefit obligations outside Germany are mainly related to retirees' health care benefit payments in the United States.

The fair value of the plan assets to fund pensions and other post-employment benefit obligations was as follows:

Fair value of plan assets as of December 31

	Pension obligations				Other post-employment obligations	
	Germany		Other countries		Other countries	
	2018	2019	2018	2019	2018	2019
	€ million	€ million	€ million	€ million	€ million	€ million
Plan assets based on quoted prices in active markets						
Real estate and special real estate funds	–	–	5	7	–	–
Equities and equity funds	387	526	55	57	–	–
Callable debt instruments	–	–	7	8	–	–
Noncallable debt instruments	657	725	126	74	–	–
Bond funds	252	408	253	245	–	–
Derivatives	2	2	–	–	–	–
Cash and cash equivalents	98	80	8	10	–	–
Other	–	–	11	10	–	–
	1,396	1,741	465	411	–	–
Plan assets for which quoted prices in active markets are not available						
Real estate and special real estate funds	110	120	–	–	–	–
Equities and equity funds	21	25	–	–	–	–
Callable debt instruments	262	238	–	–	–	–
Noncallable debt instruments	306	314	–	–	–	–
Bond funds	93	–	–	–	–	–
Derivatives	–	–	–	–	–	–
Cash and cash equivalents	–	–	–	–	–	–
Other	14	19	105	114	1	1
	806	716	105	114	1	1
Total plan assets	2,202	2,457	570	525	1	1

No properties leased by Group companies were included in the fair value of the domestic plan assets. Likewise there were no Covestro shares or bonds held through funds. The other plan assets comprise mortgage loans granted, other receivables and qualified insurance policies.

Risks

The risks from defined benefit plans arise partly from the defined benefit obligations and partly from the investment in plan assets. The risks lie in the possibility that higher direct pension payments will have to be made to the beneficiaries and/or that additional contributions will have to be made to plan assets in order to meet current and future pension obligations.

Demographic/biometric risks

Since a large proportion of the defined benefit obligations comprises lifelong pensions or surviving dependents' pensions, longer claim periods or earlier claims may result in higher benefit obligations, higher benefit expense and/or higher pension payments than previously anticipated.

Investment risks

If the actual return on plan assets were below the return anticipated on the basis of the discount rate, the net defined benefit liability would increase, assuming there were no changes in other parameters. This could happen as a result of a drop in share prices, increases in market rates of interest, default of individual debtors or the purchase of low-risk but low-interest bonds, for example.

Interest rate risks

Declining capital market interest rates, especially for high-quality corporate bonds, would increase the defined benefit obligation. This effect would be at least proportionately offset by the ensuing increase in the market values of the debt instruments held in plan assets.

Measurement parameters and their sensitivities

The bond portfolio consists exclusively of high-quality corporate bonds with a rating of at least AA or AAA. The portfolio does not include any government-guaranteed or secured bonds. The following weighted parameters were used to measure the pension obligations as of December 31 and the expense for pensions and other post-employment benefits in the respective reporting year.

Parameters for benefit obligations

	Germany		Other countries		Total	
	2018	2019	2018	2019	2018	2019
	%	%	%	%	%	%
Pension obligations						
Discount rate	1.80	1.00	3.55	2.52	2.10	1.20
Projected future salary increases	2.75	2.75	3.17	3.08	2.80	2.80
Projected future benefit increases	1.70	1.70	3.40	3.25	2.00	1.90
Other post-employment benefit obligations						
Discount rate	–	–	4.20	3.10	4.20	3.10

In Germany, the Heubeck 2018 G mortality tables were used, in the United States the adjusted RP-2014 Healthy Mortality Tables. The parameters for measuring the benefit expense are the same as those used to measure the benefit obligations in the most recent annual financial statements.

The parameter sensitivities were computed by expert actuaries based on a detailed evaluation similar to that performed to determine the net defined benefit liability. Altering individual parameters by 0.5 percentage points (mortality by 10% per beneficiary) while leaving the other parameters unchanged would have impacted pension and other post-employment benefit obligations as of the end of fiscal 2019 as follows:

Sensitivity analysis of benefit obligations

	Germany		Other countries		Total	
	Increase	Decrease	Increase	Decrease	Increase	Decrease
	€ million	€ million	€ million	€ million	€ million	€ million
Pension obligations						
0.5 percentage points change in discount rate	(423)	493	(36)	40	(459)	533
0.5 percentage points change in projected future salary increases	37	(34)	3	(3)	40	(37)
0.5 percentage points change in projected future benefit increases	251	(226)	3	(2)	254	(228)
10% change in mortality	(131)	148	(12)	13	(143)	161
Other post-employment benefit obligations						
0.5 percentage points change in discount rate	–	–	(9)	10	(9)	10
10% change in mortality	–	–	(4)	4	(4)	4

Sensitivity analysis of benefit obligations (previous year)

	Germany		Other countries		Total	
	Increase	Decrease	Increase	Decrease	Increase	Decrease
	€ million	€ million	€ million	€ million	€ million	€ million
Pension obligations						
0.5 percentage points change in discount rate	(329)	382	(37)	40	(366)	422
0.5 percentage points change in projected future salary increases	31	(28)	3	(2)	34	(30)
0.5 percentage points change in projected future benefit increases	199	(180)	2	(2)	201	(182)
10% change in mortality	(98)	109	(12)	14	(110)	123
Other post-employment benefit obligations						
0.5 percentage points change in discount rate	–	–	(8)	8	(8)	8
10% change in mortality	–	–	(3)	4	(3)	4

Provisions are also set up for the obligations, mainly of the U.S. subsidiary, to provide post-employment benefits in the form of health care cost payments to retirees. The valuation of health care costs was based on the assumption that they will increase at a rate of 7% (previous year: 6%), which should gradually decline to 5% (previous year: 5%) by 2023. The following table shows the impact on other post-employment benefit obligations and total benefit expense of a one percentage point change in the assumed cost increase rates:

Sensitivity analysis of health care cost increases

	2018		2019	
	Increase of one percentage point	Decrease of one percentage point	Increase of one percentage point	Decrease of one percentage point
	€ million	€ million	€ million	€ million
Impact on other post-employment benefit obligations	12	(10)	13	(11)

Employer contributions made or expected

The following payments or transfers correspond to the employer contributions made or expected to be made to funded benefit plans:

Employer contributions made or expected

	Germany				Other countries			
	2018	2019 expected	2019	2020 expected	2018	2019 expected	2019	2020 expected
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Pension obligations	41	37	17	41	8	12	9	12
Other post-employment benefit obligations	–	–	–	–	–	–	–	–
Total	41	37	17	41	8	12	9	12

Pensions and other post-employment benefits payable in the future from funded and unfunded plans are estimated as follows:

Future benefit payments

	Payments out of plan assets				Payments by the Company			
	Pensions		Other post-employment benefits	Total	Pensions		Other post-employment benefits	Total
	Germany	Other countries	Other countries		Germany	Other countries	Other countries	
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
2020	30	35	–	65	32	6	6	44
2021	33	35	–	68	34	6	6	46
2022	35	36	–	71	37	6	7	50
2023	39	35	–	74	40	7	7	54
2024	42	41	–	83	43	8	7	58
2025–2029	258	202	2	462	255	49	40	344

The weighted average term of the pension obligations is 22.8 years (previous year: 21.6 years) in Germany and 12.2 years (previous year: 11.4 years) in other countries. The weighted average term of the obligations for other post-employment benefits in other countries is 12.4 years (previous year: 11.9 years).

21. Other Provisions

Changes in the various provision categories in fiscal 2019 were as follows:

Changes in other provisions

	Taxes	Environ- mental protection	Restruc- turing	Trade- related commit- ments	Litigations	Personnel commit- ments	Miscella- neous	Total
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
December 31, 2018	10	44	26	7	4	610	29	730
Acquisitions	–	–	–	–	–	–	2	2
Additions	4	7	30	15	1	210	30	297
Utilization	(4)	(2)	(38)	(7)	(2)	(498)	(19)	(570)
Reversal	(1)	(1)	–	–	(2)	(18)	(11)	(33)
Reclassifications	–	–	–	–	–	(4)	–	(4)
Interest cost	–	–	–	–	–	6	–	6
Exchange differences	–	–	–	(1)	1	4	1	5
December 31, 2019	9	48	18	14	2	310	32	433
thereof long-term	–	44	14	–	–	158	14	230

Taxes

Provisions for taxes comprise provisions for other types of taxes amounting to €9 million (previous year: €10 million).

Environmental protection

Provisions for environmental protection mainly relate to the rehabilitation of contaminated land and recultivation of landfills as well as water protection measures at sites in the United States and Spain.

Restructuring

As of December 31, 2019, provisions for restructuring included €17 million (previous year: €26 million) for severance payments. The additions resulted primarily from the "Perspective" efficiency program, which aims to improve the cost structures in the medium term.

Personnel commitments

Personnel-related provisions are mainly those recorded for variable one-time, short-term and long-term incentive payments and other personnel-related provisions.

Long-term incentive programs

The long-term incentive programs of the Covestro Group entail commitments offered collectively to different groups of employees. In principle, all obligations from long-term compensation programs are covered by provisions. As of the reporting date, their amount corresponds to the fair value of the share of the respective commitments to the employee groups. All resulting valuation adjustments are recognized in profit or loss.

Senior executives and other managerial employees at Covestro have been entitled to participate in the stock-based compensation program Prisma. A percentage of the employee's annual base salary – based on his/her position – is defined as a target for variable payments (Prisma target opportunity). The payout is calculated by multiplying the Prisma target opportunity by the total shareholder return (total of Covestro's closing share price* and all of the dividends distributed in the respective performance period divided by the opening share price) and the performance of Covestro stock relative to the STOXX Europe 600 Chemicals benchmark index. The payout is capped at 200% of the Prisma target opportunity. If Covestro's shares were to significantly underperform the STOXX Europe 600 Chemicals index (e.g. if the price of the stock went down while the index increased in value), Prisma target attainment could amount to zero, in which case there would be no payout. Payouts are made regularly following each four-year performance period; the first award was payable in January 2020 for the performance period ending on December 31, 2019.

In addition to Prisma, Covestro continued to run the Bayer Group's formerly stock-based Aspire incentive program for performance periods that started prior to January 1, 2016. Senior executives were entitled to participate in Aspire I on the condition that they purchased a certain number of Bayer shares – determined for each individual according to specific guidelines – and retained them for the full term of the program. Middle management and managerial employees were entitled to participate in Aspire II. The terms of Aspire II generally matched those of Aspire I, except that Aspire II did not require a personal investment in Bayer stock, and the exclusive performance measure was Bayer's absolute share price performance. The payout for the last remaining tranche 2015–2018 for both Aspire programs in January 2019 amounted to €15 million (payout in the previous year: €18 million).

The net expense for all long-term incentive programs amounted to €16 million (previous year: €11 million), of which €5 million (previous year: €4 million) was attributable to the stock participation program Covestment, explained in greater detail in the following section.

The fair value for the stock-based incentive program Prisma recognized in the provision amounted to €53 million as of December 31, 2019 (previous year: €41 million). The fair value was calculated using the Monte Carlo simulation method on the basis of the following key parameters pertaining to the reporting date:

Monte Carlo simulation parameters

	Tranche		
	2017	2018	2019
Risk-free interest rate	–0.18%	–0.36%	–0.31%
Stock price volatility	+32.05%	+33.62%	+31.02%
STOXX Europe 600 Chemicals volatility	+15.65%	+16.09%	+14.57%
Correlation between stock price and STOXX Europe 600 Chemicals	0.73	0.71	0.64

Stock participation program (Covestment)

Under the Covestment program, employees of numerous Group companies could invest a fixed amount of their compensation in Covestro shares in fiscal 2019, which Covestro supplemented through an employer subsidy. The discount granted for fiscal 2019 was generally 30% of the subscription amount and is set every year. The total individual investment amount was capped at €3,600, depending on the Group company and the employee's position. Overall, around 97% of Covestro's global workforce was authorized to participate in Covestment.

Around 381,000 shares were purchased by employees under the Covestment program in fiscal 2019. Depending on the Group company, the purchased shares are subject to a vesting period of at least one year from the subscription date.

* Calculated as the average price for the last 30 days of trading in the relevant performance period

22. Financing and Financial Liabilities

The bonds issued through the Debt Issuance Program launched in the first quarter of 2016 are a key form of external financing. Bonds with a total nominal volume of €1,500 million were placed, of which €500 million was repaid as scheduled in March 2018. As of the reporting date, Covestro still has two fixed-rate tranches with terms until October 2021 (a coupon of 1.00% and a volume of €500 million) and September 2024 (a coupon of 1.75% and a volume of €500 million) in its portfolio. Both bonds received a Baa1 rating from Moody's Investors Service, London (United Kingdom).

Additional liquidity is provided by a multicurrency revolving credit facility totaling €1,500 million with a term until September 2022. No loans had been drawn against this syndicated credit facility as of December 31, 2019. The Group had total credit facilities of €1,510 million (previous year: €1,524 million) at its disposal. Of this amount, €10 million (previous year: €24 million) was drawn down while €1,500 million (previous year: €1,500 million) remained unused.

Financial liabilities were comprised as follows:

Financial liabilities

	Dec. 31, 2018		Dec. 31, 2019	
	Total	Of which current	Total	Of which current
	€ million	€ million	€ million	€ million
Bonds	996	–	997	–
Liabilities to banks	24	18	10	10
Lease liabilities	193	29	735	131
Liabilities from derivatives	12	12	10	10
Total	1,225	59	1,752	151

Maturities of financial liabilities

Dec. 31, 2018		Dec. 31, 2019	
Maturity	€ million	Maturity	€ million
2019	59	2020	151
2020	32	2021	608
2021	529	2022	96
2022	33	2023	83
2023	27	2024	545
2024 or later	545	2025 or later	269
Total	1,225	Total	1,752

The financial liabilities of the Covestro Group are mainly unsecured.

Lease liabilities

The increase in lease liabilities in fiscal 2019 was attributable to the initial application of IFRS 16, see note 2.1 „Financial reporting standards applied for the first time in the reporting period.“ Lease payments of €876 million (previous year: €250 million) are to be made to the respective lessors in future years; of this amount, the interest component amounts to €141 million (previous year: €57 million). The lease liabilities mature as follows:

Lease liabilities

Dec. 31, 2018				Dec. 31, 2019			
	Lease payments	Interest component	Lease liabilities		Lease payments	Interest component	Lease liabilities
Maturity	€ million	€ million	€ million	Maturity	€ million	€ million	€ million
2019	41	12	29	2020	155	24	131
2020	41	10	31	2021	131	22	109
2021	39	9	30	2022	112	16	96
2022	38	6	32	2023	96	13	83
2023	31	5	26	2024	56	9	47
2024 or later	60	15	45	2025 or later	326	57	269
Total	250	57	193	Total	876	141	735

Further information on the accounting for liabilities from derivatives is given in note 24.2 “Financial risk management and information on derivatives.”

23. Other Liabilities

Other liabilities were comprised as follows:

Other liabilities

	Dec. 31, 2018		Dec. 31, 2019	
	Total	Of which current	Total	Of which current
	€ million	€ million	€ million	€ million
Other tax liabilities	96	96	83	83
Deferred income	1	1	1	1
Grants and subsidies received from governments	13	7	11	4
Liabilities to employees	26	24	34	30
Liabilities for social expenses	17	17	11	11
Accrued interest on liabilities	5	5	5	5
Contract liabilities	28	28	18	18
Refund liabilities	33	32	30	30
Miscellaneous liabilities	21	12	30	9
Total	240	222	223	191

The miscellaneous liabilities included €3 million (previous year: €4 million) in liabilities from derivatives.

Further information on contract liabilities is given in note 6 “Sales.”

24. Financial Instruments

24.1 Financial instruments by category

The following tables show the carrying amounts and fair values of financial assets and liabilities based on IFRS 9:

Carrying amounts of financial instruments and their fair values as of December 31, 2019

	Measurement according to IFRS 9					Fair value € million
	Carrying amount	Carried at amortized cost	Fair value through other comprehen- sive income	Fair value recognized in profit or loss	Measurement according to IFRS 16	
	€ million	€ million	€ million	€ million		
Financial assets						
Trade accounts receivable	1,561	1,561				1,561
Other financial assets	59					
Loans	16	16				16
Derivatives that do not qualify for hedge accounting	22			22		22
Receivables under lease agreements	8				8	19
Other investments	13		13			13
Other receivables ¹	41	32		9		41
Cash and cash equivalents	748	748				748
Financial liabilities						
Financial debt	1,752					
Bonds	997	997				1,045
Lease liabilities ²	735				735	
Liabilities to banks	10	10				10
Derivatives that do not qualify for hedge accounting	10			10		10
Trade accounts payable	1,507	1,507				1,507
Other liabilities ³	64					
Derivatives that do not qualify for hedge accounting	3			3		3
Refund liabilities ⁴	30	30				30
Miscellaneous other liabilities	31	31				31

¹ The other receivables recognized in the consolidated statement of financial position also include nonfinancial assets totaling €370 million.

² In accordance with IFRS 7.29 (d), disclosures on the fair value of lease liabilities are no longer required from fiscal 2019 onward.

³ The other liabilities recognized in the consolidated statement of financial position also include nonfinancial liabilities totaling €159 million.

⁴ The refund liabilities recognized on the balance sheet in accordance with IFRS 15 will be presented as financial liabilities beginning in fiscal 2019. Reference information was adjusted accordingly.

Carrying amounts of financial instruments and their fair values as of December 31, 2018

	Measurement according to IFRS 9				Measurement according to IAS 17	Fair value € million
	Carrying amount	Carried at amortized cost	Fair value through other comprehensive income	Fair value recognized in profit or loss		
	€ million	€ million	€ million	€ million		
Financial assets						
Trade accounts receivable	1,786	1,786				1,786
Other financial assets	48					
Loans	12	12				12
Derivatives that do not qualify for hedge accounting	20			20		20
Receivables under lease agreements	9				9	16
Other investments	7		7			7
Other receivables ¹	35	35		–		35
Cash and cash equivalents	865	865				865
Financial liabilities						
Financial debt	1,225					
Bonds	996	996				1,030
Lease liabilities	193				193	231
Liabilities to banks	24	24				24
Derivatives that do not qualify for hedge accounting	12			12		12
Trade accounts payable	1,637	1,637				1,637
Other liabilities ²	59					
Derivatives that do not qualify for hedge accounting	4			4		4
Refund liabilities ³	33	33				33
Miscellaneous other liabilities	22	22				22

¹ The other receivables recognized in the consolidated statement of financial position also include nonfinancial assets totaling €343 million.

² The other liabilities recognized in the consolidated statement of financial position also include nonfinancial liabilities totaling €181 million.

³ The refund liabilities recognized on the balance sheet in accordance with IFRS 15 will be presented as financial liabilities beginning in fiscal 2019. Reference information was adjusted accordingly.

The fair values of financial instruments are determined and reported in accordance with IFRS 13 (Fair Value Measurement) on the basis of the fair value hierarchy described below:

Level 1 covers fair values determined on the basis of unadjusted prices which exist in active markets.

Level 2 comprises fair values determined on the basis of parameters which are observable in an active market.

Level 3 applies to fair values determined using parameters whose input factors are not based on observable market data.

The following table shows the assignment of the financial instruments to the three-level fair value hierarchy:

Fair value hierarchy of financial instruments

	Fair value				Fair value			
	Dec. 31, 2018	Level 1	Level 2	Level 3	Dec. 31, 2019	Level 1	Level 2	Level 3
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Financial assets carried at fair value								
Other investments	7	2		5	13	5		8
Derivatives that do not qualify for hedge accounting	20		12	8	22		15	7
Other receivables					9			9
Financial assets not carried at fair value								
Receivables under lease agreements	16			16	19			19
Financial liabilities carried at fair value								
Derivatives that do not qualify for hedge accounting	16		12	4	13		10	3
Financial liabilities not carried at fair value								
Bonds	1,030	1,030			1,045	1,045		
Lease liabilities ¹	231		231					
Liabilities to banks	24		24		10		10	

¹ In accordance with IFRS 7.29 (d), disclosures on the fair value of lease liabilities are no longer required from fiscal 2019 onward.

Reallocation between the different levels of the fair value hierarchy takes place at the end of the reporting period in which the change occurred. During the fiscal year, no transfers were made between the levels of the fair value hierarchy.

Because of the generally short maturities of cash and cash equivalents, loans, trade accounts receivable and payable, and other receivables and liabilities, their carrying amounts do not significantly differ from the fair values.

The fair value of the bonds issued by Covestro AG is based on quoted, unadjusted prices in active markets and therefore assigned to Level 1 of the fair value hierarchy. The fair value of some of the other investments is also based on quoted prices in active markets (Level 1).

The fair values stated for noncurrent financial assets and liabilities are the present values of the respective future cash inflows or outflows. These are determined by discounting the cash flows at a reporting-date interest rate that takes into account the term of the assets or liabilities and the creditworthiness of the counterparty. For this reason, these values are assigned to Level 2 of the fair value hierarchy.

The fair values of derivatives for which no publicly quoted market prices exist are determined using valuation techniques based on observable market data as of the reporting date (Level 2). Credit value adjustments and debt value adjustments are determined to allow for both the contracting party's credit risk and Covestro's own credit risk. The currency forward contracts are measured individually at their forward rates or forward prices as of the reporting date. These depend on spot rates or prices including time spreads.

Fair values measured using unobservable inputs are categorized within Level 3 of the fair value hierarchy. The fair values of noncurrent leasing receivables, reported for information purposes, are calculated on the basis of interest curves observable in the market. Additionally, a discount for cash flows that are very far in the future was applied as an unobservable factor.

Other investments comprising exclusively equity instruments are accounted for at fair value directly in other comprehensive income because they are held for the long term for strategic reasons. The fair value of some of the other investments is based on quoted prices in active markets (Level 1). Where there are no quoted, unadjusted prices in an active market for identical or similar instruments, and there is no suitable valuation method where all major input factors are based on observable market data, the fair value of the other investments is determined using a market price-oriented valuation method where the main input factors are not based on observable market data (Level 3). The valuation of certain other investments is based on available performance indicators as well as on market valuation multipliers. The estimated fair value of the equity instruments categorized within Level 3 would rise (fall) if the multiple applied were to be greater (smaller).

Further, the fair values of embedded derivatives are determined on the basis of unobservable input factors (Level 3). They are separated from their respective host contracts, which are purchase agreements relating to the operational business. The embedded derivatives cause the cash flows from the contracts to vary with fluctuations in exchange rates or regional and industry-specific price indices, for example. The internal measurement of embedded derivatives is mainly performed using the discounted cash flow method, which is based on unobservable inputs. These include prices or price indices derived from market data. The estimated fair value of the embedded derivative would rise (fall) if the expected payment flows were to be higher (lower) as a result of fluctuations in exchange rates or prices.

Other receivables include a contingent purchase price receivable from divestments. The fair value of the receivable is measured as the present value of the future cash inflows. The basis is the expected EBITDA of the business unit sold for 2021. The cash flows are discounted at the current interest rate for the appropriate term on the reporting date and reflecting the creditworthiness of the buyer. The contingent purchase price receivable is assigned to Level 3 of the fair value hierarchy. The estimated fair value would rise (fall) if the expected cash inflows were to be higher (lower) or if the risk-adjusted discount rate were to be lower (higher).

The table below shows the reconciliation of Level 3 financial instruments:

**Changes in the net amount of financial assets and liabilities
recognized at fair value based on unobservable inputs**

	2018	2019
	€ million	€ million
Net carrying amounts, Jan. 1	7	9
Gains (losses) recognized in profit or loss	1	–
of which related to assets/liabilities recognized in the statement of financial position	1	–
Gains (losses) recognized outside profit or loss	1	–
Additions of assets (liabilities)	–	12
Settlements of (assets) liabilities	–	–
Reclassifications	–	–
Net carrying amounts, Dec. 31	9	21

Gains and losses from Level 3 financial instruments recognized in profit or loss result primarily from embedded derivatives and are reported in other operating expenses or income.

Other financial investments amount to €13 million, of which €4 million is attributable to Hi-Bis GmbH, Bitterfeld-Wolfen, and €3 million to the interest in Hydrogenious LOHC Technologies GmbH, Erlangen, acquired in fiscal year. In fiscal 2019, the Covestro Group received dividends of €2 million (previous year: €1 million) from other financial investments, all of which was attributable to Hi-Bis GmbH.

The following table shows income, expenses, gains and losses from financial instruments assigned to the measurement categories in accordance with IFRS 9:

Net result by measurement category in accordance with IFRS 9

	2018	2019
	€ million	€ million
Financial assets at amortized cost	46	(1)
of which net interest	6	4
Financial instruments measured at fair value through other comprehensive income	1	2
of which net interest	–	–
Financial instruments measured at fair value through profit or loss	(36)	–
of which net interest	(19)	(4)
Liabilities carried at amortized cost	(56)	(45)
of which net interest	(31)	(46)

24.2 Financial risk management and information on derivatives

Capital management

The main purpose of financial management is to ensure solvency at all times, continuously optimize capital costs and reduce the risks of financing measures. Financial management for the Covestro Group is performed centrally by Covestro AG.

Moody's Investors Service, London (United Kingdom), currently assigns Covestro AG an investment-grade rating of Baa1 with a stable outlook. Covestro uses the debt ratios published by prominent rating agencies in managing its capital and pursues a conservative debt policy along with a balanced financing portfolio. This is based for the most part on bonds, syndicated credit facilities and bilateral loan agreements.

Credit risk

Credit risk is the risk of a loss for the Covestro Group when a counterparty is unable to meet its payment obligations arising from a financial instrument as contractually stipulated. The payment obligations to the Covestro Group primarily comprise trade accounts receivable, debt instruments, other financial assets and contract assets.

The carrying amount of the financial assets and the contract assets represents the maximum credit risk exposure.

The impairment loss for financial assets and contract assets recognized during the year resulted almost exclusively from impairment losses on trade accounts receivable. The net impairment loss amounted to €0 million (previous year: €1 million) in the reporting year.

Trade accounts receivable and contract assets

The credit risk the Covestro Group is exposed to through its trade accounts receivable and contract assets depends largely on the creditworthiness of the customer. In order to manage this risk, the Covestro Group's Credit Management implemented a process that uses internal and external data to assess each customer in terms of its creditworthiness. Quantitative and qualitative data are evaluated during the assessment process. The assessment reflects financial data, ratings, payment history and data on the customer's environment. The customer is allocated to one of five risk categories on the basis of the final assessment. The categories range from A to E, with risk category A representing the most creditworthy companies and risk category E the least.

Meaningful data is used to determine an expected loss rate for each risk category. Data such as default probabilities from rating agencies and credit insurance firms, historical impairment losses recognized by the Covestro Group and the empirical data from Credit Management are used to determine the expected loss rates. In addition, forward-looking information such as the country rating is also used in determining the expected loss rates. Every year the expected and actual losses are compared (backtesting).

The following table presents the gross carrying amounts and the expected losses for trade receivables and contract assets:

Expected credit loss by category as of December 31

2019	Cluster					Total
	A	B	C	D	E	
Expected loss rate (%)	0.03	0.14	0.51	1.79	9.37	
Gross amount (€ million)	350	543	547	155	16	1,611
Expected loss (€ million)	–	(1)	(3)	(3)	(1)	(8)
2018	A	B	C	D	E	Total
Expected loss rate (%)	0.03	0.14	0.51	1.79	9.37	
Gross amount (€ million)	421	567	637	206	15	1,846
Expected loss (€ million)	–	(1)	(3)	(4)	(1)	(9)

The accumulated impairment losses amounted to €28 million (previous year: €33 million) for those customers that the Covestro Group considers credit impaired on the basis of this assessment. The corresponding gross carrying amount amounted to €29 million (previous year: €35 million). Indicators that trade accounts receivable and contract assets are at risk of credit impairment include significant financial difficulties of the customer and breach of contract such as overdue payments. Determining that a customer is credit impaired does not occur automatically when payments are overdue for more than 90 days, but is instead always based on the individual assessment conducted by Credit Management.

Total impairment losses for trade accounts receivable and contract assets changed as follows:

Reconciliation expected credit loss

	2018	2019
	€ million	€ million
Valuation allowances, Jan. 1	(51)	(42)
Net remeasurement impairment loss	(1)	–
Write offs	10	6
Foreign exchange differences	–	–
Valuation allowance, Dec. 31	(42)	(36)

The Covestro Group limits the credit risk exposure from trade accounts receivable by stipulating the shortest payment terms possible. In addition, the Covestro Group has a widely diversified customer portfolio. In order to avoid concentration of risk, customer limits are set, regularly monitored and exceeded only in agreement with Credit Management.

Receivables of €27 million (previous year: €44 million) are secured mainly by letters of credit.

Debt instruments

The Covestro Group pursues a conservative investment policy based on a strategy of maintaining liquidity and safeguarding value. Consequently, the investments are limited to counterparties with investment grade ratings, simple debt instruments and short-term investment horizons. Credit risks, particularly concentration of risk with individual counterparties, are managed by means of a Group-wide limit system in conjunction with ongoing monitoring.

The general approach for calculating and recording impairment losses in accordance with IFRS 9 applies to all debt instruments, loan commitments and financial guarantees recognized at amortized cost or at their fair values directly in equity. Covestro uses a general, three-stage approach for measuring the risk provision for expected credit losses as follows:

- Stage 1: The risk provision is calculated as the 12-month expected credit loss, whereby the default probability is derived from historical data published by prominent rating agencies. The Covestro Group assumes that investment grade ratings imply a low level of credit risk.
- Stage 2: The amount of the risk provision is the expected credit loss over the lifetime of the debt instrument if the credit risk has increased significantly since its initial recognition. Changes in credit risk are assessed using the actual payment history and external information. Whenever available, Covestro uses credit default swap prices and other forward-looking information such as ratings outlooks in addition to external ratings.
- Stage 3: If Covestro determines that the collectability of a debt instrument has deteriorated, it is reclassified to stage 3. This is the case, for instance, when a counterparty has obtained insolvency status; when there is sufficient information available to show that the counterparty has applied for insolvency proceedings; or when debt instruments are more than 90 days overdue.

No reclassification between the stages of the general impairment approach took place either in the reporting period or in the reference period. The Covestro Group holds no collateral to secure its debt instruments.

Because of the low credit risk profile, the Covestro Group is not exposed to significant credit risk from debt instruments. For fiscal 2019 and for the previous year, the risk provision calculated using the general approach is immaterial both overall and for the individual stages, thus the respective gross carrying amount corresponds to the net carrying amount of the debt instrument.

Currency risks

Currency opportunities and risks for the Covestro Group result from changes in exchange rates and the related changes in the value of financial instruments (including receivables and payables) and of anticipated payment receipts and disbursements in foreign currencies. Material receivables and payables in liquid currencies from operating and financial activities are generally fully hedged through forward exchange contracts. A value-at-risk approach is used to manage foreign currency exposures arising from planned receivables and liabilities. As in the previous year, the planned foreign currency exposure was not hedged. They will be reheded using forward contracts if the foreign currency risk increases significantly. The extent of the currency risk is represented below by a sensitivity analysis.

The currency risk shown in the sensitivity analysis results from the following:

- The unsecured portion of receivables and payables in nonfunctional currencies
- Unsecured bank deposits and liabilities to banks in nonfunctional currencies
- Currency risks from embedded derivatives

Sensitivities were determined based on a hypothetical scenario in which the euro depreciates by 10% against all other currencies compared with the year-end exchange rates. Under this scenario, the estimated hypothetical gains recognized in profit or loss as of December 31, 2019, would have totaled €7.7 million (previous year: gains of €18.1 million). The table below shows the distribution of these effects among the individual currencies:

Sensitivity by currency

2018		2019	
Currency	€ million	Currency	€ million
CNY	14.0	CNY	3.9
USD	3.3	USD	2.7
MXN	0.6	RUB	0.3
Other	0.2	Other	0.8
Total	18.1	Total	7.7

Liquidity risk

Liquidity risk is the risk of not being able to meet existing or future payment obligations. The liquidity status of all material Group companies is continuously planned and monitored. Liquidity is secured by cash pooling agreements as well as internal and external financing. A syndicated revolving credit facility offers additional financial flexibility.

The liquidity risks to which the Covestro Group was exposed from its financial instruments can be divided into obligations for interest and repayment installments on financial liabilities and payment obligations arising from derivatives. The following tables show the maturity structure of the nondiscounted contractually agreed payments arising from these line items:

Maturity analysis of financial liabilities and derivative financial instruments

	Carrying amount	Contractual cash flows					
	Dec. 31, 2019	2020	2021	2022	2023	2024	after 2024
	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Financial liabilities							
Bonds	997	14	514	9	9	509	–
Liabilities to banks	10	10	–	–	–	–	–
Lease liabilities	735	155	131	112	96	56	326
Trade accounts payable	1,507	1,507	–	–	–	–	–
Other liabilities							
Accrued interest on liabilities	5	5	–	–	–	–	–
Refund liabilities ¹	30	30	–	–	–	–	–
Remaining liabilities	26	10	2	1	1	–	12
Liabilities from derivatives							
Derivatives that do not qualify for hedge accounting	13	11	1	1	–	–	–
Receivables from derivatives							
Derivatives that do not qualify for hedge accounting	22	17	2	2	1	–	–
Loan commitments	–	208	–	–	–	–	–

	Carrying amount	Contractual cash flows					
	Dec. 31, 2018	2019	2020	2021	2022	2023	after 2023
	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Financial liabilities							
Bonds	996	14	14	514	9	9	509
Liabilities to banks	24	18	1	1	1	1	2
Lease liabilities	193	41	41	39	38	31	60
Trade accounts payable	1,637	1,637	–	–	–	–	–
Other liabilities							
Accrued interest on liabilities	5	5	–	–	–	–	–
Refund liabilities ¹	33	32	1	–	–	–	–
Remaining liabilities	17	11	–	–	–	–	6
Liabilities from derivatives							
Derivatives that do not qualify for hedge accounting	16	13	1	1	1	–	–
Receivables from derivatives							
Derivatives that do not qualify for hedge accounting	20	14	2	2	1	1	–
Loan commitments	–	208	–	–	–	–	–

¹ The refund liabilities recognized on the balance sheet in accordance with IFRS 15 will be presented as financial liabilities beginning in fiscal 2019. Reference information was adjusted accordingly.

In addition to the primary financial liabilities and derivative financial instruments, there was an obligation under certain conditions to make a loan of €208 million (previous year: €208 million) to the effective initial fund of Bayer-Pensionskasse VVaG, which may result in payments by Covestro AG in subsequent years. This is reflected in the loan commitments shown in the table above. Further information is given in note 25 "Contingent Liabilities and Other Financial Commitments."

In this analysis, foreign currencies were translated at the closing rates. Derivative financial instruments are reported as net amounts.

Interest rate risks

Interest rate opportunities and risks for the Covestro Group result from changes in capital market interest rates, which could lead to changes in the fair value of fixed-rate financial instruments and in interest payments in the case of floating-rate instruments. To minimize adverse effects, interest rate risk is managed centrally based on an optimized debt maturity structure.

A sensitivity analysis based on our net floating-rate receivables and payables position at year end 2019, taking into account the interest rates relevant for our receivables and payables in all principal currencies, produced the following result: A hypothetical increase in the interest rates by 100 basis points or one percentage point would (assuming currency exchange rates remain constant) not impact interest expenses or interest income, since, as in the previous year, there are no floating-rate receivables and payables at year end.

Raw material price risks

The Covestro Group requires significant quantities of energy and petrochemical feedstocks for its production processes. Procurement prices for energy and raw materials may fluctuate significantly. Important raw materials are procured on the basis of long-term supply agreements and an active supplier management to minimize substantial price fluctuations. In steam and electricity generation, we aim for market-based price indexing, a diversification of fuels and a mix of external procurement and captive production to minimize the price fluctuation risk for energies. During the past fiscal year, derivative financial instruments were not used to hedge raw material price risks.

Derivatives

As of the reporting date, the nominal volume of the forward exchange contracts used to hedge currency risk amounted to €2,015 million (previous year: €1,608 million). Other market risks are not hedged as of the reporting date.

Covestro has entered into master netting agreements or similar agreements for derivative financial instruments. These take effect in particular in the event of the insolvency of one of the contractual partners involved. The derivative financial instruments covered by netting agreements from the perspective of the Covestro Group are presented in the table below:

Disclosures for netting of financial assets and liabilities as of December 31

	Gross amounts of financial assets / liabilities	Net amounts of financial assets / liabilities presented in the balance sheet	Balance sheet amounts eligible for netting covered by netting agreements	Net amounts after possible netting
	€ million	€ million	€ million	€ million
2019				
Receivables from derivatives	15	15	3	12
Liabilities from derivatives	10	10	3	7
2018				
Receivables from derivatives	12	12	5	7
Liabilities from derivatives	12	12	5	7

25. Contingent Liabilities and Other Financial Commitments

Contingent liabilities

The following table presents warranty contracts as well as other contingent liabilities existing as of the reporting date:

Contingent liabilities

	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million
Warranties	1	2
Other contingent liabilities	3	3
Total	4	5

Other financial commitments

The other financial commitments were as follows:

Other financial commitments

	Dec. 31, 2018	Dec. 31, 2019
	€ million	€ million
Operating leases ¹	450	–
Orders already placed for started or planned investment projects	248	340
Loan commitments to Bayer-Pensionskasse VVaG	208	208
Total	906	548

¹ Application of IFRS 16 since January 1, 2019, has eliminated the need to differentiate between operating leases and finance leases, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

In cases where pension obligations allocable to the Covestro Group are funded through pension institutions used jointly with other companies (especially Bayer), it is generally contractually ensured that Covestro participates in funding measures that serve to guarantee adequate funding status and/or adequate solvency capital of these pension institutions for the long term. To this end, Covestro AG agreed to grant Bayer-Pensionskasse VVaG an interest-bearing loan of up to €208 million for the effective initial fund as required.

26. Legal Risks

As a company with international operations, the Covestro Group is exposed to numerous legal risks, particularly in the areas of product liability, competition and antitrust law, patent disputes, tax law, environmental law, and compliance issues such as corruption and export control. The outcome of any current or future proceedings cannot be predicted. It is therefore possible that legal judgments or regulatory decisions or future settlements could give rise to expenses that are not covered, or not fully covered, by insurers' compensation payments and could significantly affect the earnings of the Covestro Group.

Legal proceedings currently considered to involve material risks are outlined below. The legal proceedings referred to do not necessarily represent an exhaustive list:

Carbon monoxide pipeline from Dormagen to Krefeld-Uerdingen

The carbon monoxide pipeline is intended to connect the chemical production sites at Dormagen and Krefeld-Uerdingen and complement the network already existing between Dormagen and Leverkusen. The aim is to ensure a safe and reliable supply of carbon monoxide to and across all sites. Although the pipeline was almost completed by the end of 2009, it cannot currently be put into operation because of ongoing court proceedings. Following confirmation by the Düsseldorf Administrative Court in 2011 that there were no grounds to challenge the material aspects of the planning permission decision, in particular the safety of the materials used and the legal conformity of the relevant pipeline act (Rohrleitungsgesetz), the plaintiffs and the regional government against which legal proceedings had been instituted lodged appeals before the Higher Administrative Court in Münster. In 2014, the Münster Higher Administrative Court raised no objections in principle to the safety and routing of the pipeline, but questioned the constitutionality of the pipeline act which forms the legal basis for the

project. On December 21, 2016, the German Federal Constitutional Court dismissed the corresponding constitutionality question referred to it by Münster Higher Administrative Court as inadmissible and confirmed the legal opinion of the Covestro Group. Münster Higher Administrative Court must now return to considering the facts of the appeal.

Civil class action lawsuits (United States) over diisocyanates

On July 9, 2018, Covestro LLC, Pittsburgh (United States) – as one of numerous other defendants – was served the first of now 12 class action lawsuits initiated by various U.S. Diphenylmethane Diisocyanate (MDI) and Toluene Diisocyanate (TDI) customers. The plaintiffs allege that the defendants have violated various provisions of the Sherman Antitrust Act since January 1, 2015, by acting in coordination to limit production capacities of MDI and TDI and, at the same time, raising prices for these products in the market. On October 3, 2018, the U.S. Judicial Panel on Multidistrict Litigation ruled that all class action lawsuits in pretrial proceedings would be centralized in the District Court for the Western District of Pennsylvania. Based in essence on the same assertions and the violations of federal consumer protection and antitrust laws allegedly resulting from them, the attorney general of the state of Mississippi filed a separate civil complaint against Covestro LLC and numerous other defendants on behalf of the state and its citizens in September 2019. Covestro currently considers these claims without merit and will therefore use all legal means to defend itself against these allegations – also in light of the official conclusion in November 2018 of the six-month investigation by the U.S. Department of Justice into possible anticompetitive practices in relation to MDI.

The following legal proceedings could be concluded in the 2019 fiscal year:

Duties to inform for the use of diisocyanates (United States)

On September 14, 2016, Covestro LLC, Pittsburgh (United States), – amongst three other defendants – was served with a lawsuit filed by a law firm for a plaintiff in California Federal Court. This has since been transferred to a federal court in Washington D.C. (United States) by agreement of the parties involved. This action seeks financial damages due to fines allegedly enforceable and due by the defendants to the U.S. Environmental Protection Agency because they supposedly withheld information about the health risks associated with the manufacture and use of TDI, MDI and Polymeric Diphenylmethane Diisocyanate (PMDI). The U.S. government declined to intervene and proceed with the claims itself despite sufficient opportunity to do so under the applicable laws. It is therefore now up to the law firm to proceed with the claims asserted on behalf of the government. Violations of the Toxic Substances Control Act (TSCA) and False Claims Act (FCA) are asserted. The trial court dismissed the action on October 23, 2017. The plaintiff then filed a timely appeal, which the court of first instance dismissed on June 22, 2018. The plaintiff thereupon appealed this decision; following oral proceedings argued on May 13, 2019, the appeal was rejected in its entirety by the competent court of appeals. The deadline for the plaintiff to file a petition with the United States Supreme Court expired on October 3, 2019, with no action being taken. The dismissal of the claim is therefore final, and the legal dispute is ended.

Other Information

27. Notes to the Statement of Cash Flows

27.1 Cash flows from operating activities

The net cash of €1,383 million (previous year: €2,376 million) provided by operating activities comprises the cash surplus from operating activities and reflects the changes in working capital and other noncash transactions.

The €993 million (–41.8%) year-over-year decrease in net cash provided by operating activities was chiefly the result of lower EBIT by €1,728 million. This decrease was partially offset by lower income tax payments (€278 million) compared to the previous year and inflows from working capital amounting to €77 million (previous year: outflows of €231 million).

27.2 Cash flows from investing activities

Net cash outflow for investing activities in fiscal 2019 amounted to €838 million (previous year: €346 million).

These mainly included cash outflows for additions to property, plant, equipment and intangible assets of €910 million (previous year: €707 million). The sale of the European system house business to H.I.G. Capital, Miami (United States), had an opposite effect which generated proceeds from divestitures of €51 million.

27.3 Cash flows from financing activities

In fiscal 2019, there was a net cash outflow of €668 million (previous year: €2,402 million) for financing activities. Net loan repayments amounted to €147 million (previous year: €582 million).

In April 2019, dividends totaling €438 million were paid to Covestro AG stockholders.

The interest paid totaling €86 million (previous year: €74 million) reflected in cash flows from financing activities relates mainly to forward exchange contracts used to hedge foreign currency risks of €39 million (previous year: €43 million), lease liabilities of €33 million (previous year: €14 million), and bonds of €14 million (previous year: €14 million).

The cash flows from financing activities in the reporting year also include payments for leases recognized on the balance sheet for the first time upon initial application of IFRS 16, see note 2.1 "Financial reporting standards applied for the first time in the reporting period."

Reconciliation of financial debt in 2019

	Carrying amounts Dec. 31, 2018	Changes cash flows realized	Changes cash flows not realized					Carrying amounts Dec. 31, 2019
			Changes due to exchange rate movements	Changes in measurement	Acquisitions (IFRS 3)	Effects of IFRS 16	Other changes	
	€ million	€ million	€ million	€ million	€ million	€ million	€ million	€ million
Bonds	996	–	–	1	–	–	–	997
Liabilities to banks	24	(8)	1	–	–	–	(7)	10
Lease liabilities	193	(139)	18	–	4	656	3	735
Financial debt¹	1,213	(147)	19	1	4	656	(4)	1,742

¹ Not including forward exchange contracts used to hedge currency risks

28. Related Companies and Persons

28.1 Related companies

Related entities as defined in IAS 24 (Related Party Disclosures) are those legal entities that are able to exert at least significant influence on Covestro AG and its subsidiaries or over which Covestro AG or its subsidiaries exercise control or have at least a significant influence. They include nonconsolidated subsidiaries, joint ventures, associated companies and post-employment benefit plans.

Receivables from and Liabilities to Related Parties

	Dec. 31, 2018		Dec. 31, 2019	
	Receivables	Liabilities	Receivables	Liabilities
	€ million	€ million	€ million	€ million
Nonconsolidated subsidiaries and associates	4	9	–	5
Joint ventures	1	–	–	–
Associates	11	1	3	–

Sales and Purchases of Goods and Services to/from Related Parties

	2018		2019	
	Sales of goods and services	Purchases of goods and services	Sales of goods and services	Purchases of goods and services
	€ million	€ million	€ million	€ million
Nonconsolidated subsidiaries and associates	44	48	40	67
Joint ventures	4	–	–	–
Associates	24	688	11	569

The goods and services provided by associated companies mainly result from the ongoing operating business with PO JV, LP, Wilmington (United States). Covestro benefits from fixed long-term supply quotas/volumes of propylene oxide (PO) from this company's production. Further details on these business relationships are given in note 15 "Investments Accounted for Using the Equity Method."

Receivables from and payables to related parties mainly comprise leasing and financing matters, trade in goods and services and other transactions. No impairment losses were recorded on receivables from related parties either in the reporting period or in the reference period.

28.2 Related persons

Related persons as defined in IAS 24 are those natural persons who, on account of their function in the Covestro Group, are responsible for Covestro's global business operations. These persons include the corporate officers of Covestro AG, who are the members of the Board of Management and Supervisory Board.

Compensation of the corporate officers

Total compensation of €9,486 thousand (previous year: €15,790 thousand) was paid to the corporate officers in fiscal 2019, including the compensation of the Supervisory Board amounting to €1,747 thousand (previous year: €1,742 thousand).

This compensation is shown below:

Board Members Compensation According to IFRSs

	2018	2019
	€ thousand	€ thousand
Total short-term compensation	12,531	5,308
Termination benefits	674	–
Total stock-based compensation (long-term incentive)	1,151	2,827
Service cost for pension entitlements earned in the respective year	1,434	1,351
Aggregate compensation (IFRSs)	15,790	9,486

Aggregate compensation (German Commercial Code) amounted to €6,274 thousand and is stated in the "Compensation Report" of the combined management report. The fair value of the long-term stock-based compensation (Prisma) granted to the Board of Management in fiscal 2019 was €2,724 thousand (previous year: €3,560 thousand).

Provisions of €5,103 thousand (previous year: €12,011 thousand) were recognized for the short-term variable cash compensation and long-term stock-based cash compensation for the members of the Board of Management serving during the 2019 reporting period. At the end of the year, the present value of the defined benefit pension obligations for the current members of the Board of Management was €9,818 thousand (previous year: €6,825 thousand). Provisions of €6,027 thousand were recognized for long-term stock-based cash compensation for former members of the Board of Management. The present value of the defined benefit pension obligations for former members of the Board of Management was €7,818 thousand (previous year: €6,856 thousand).

Since 2016, the members of the Board of Management have been entitled to participate in the Prisma long-term stock-based compensation program, as long as they are employed by the Covestro Group, and acquire for their own account and hold an individually defined number of Covestro shares as specified by the guidelines.

The compensation of the Supervisory Board is exclusively non-performance-related. In addition to their compensation as members of the Supervisory Board, those employee representatives who are employees of Covestro Group companies receive compensation unrelated to their service on the Supervisory Board. The total amount of such compensation was €883 thousand (previous year: €925 thousand). Pension obligations for employee representatives on the Supervisory Board amounted to €3,346 thousand (previous year: €2,672 thousand).

There were no advances or loans to members of the Board of Management or the Supervisory Board outstanding as of December 31, 2019, or at any time during fiscal 2019 or the previous year.

29. Auditor's Fees

Since fiscal 2018 KPMG AG Wirtschaftsprüfungsgesellschaft, Düsseldorf, (KPMG AG) is the elected statutory auditor of Covestro AG and Covestro Group. The following fees were recognized as expenses for the services provided by KPMG AG:

Auditor's fees

	2018	2019
	€ million	€ million
Audit services	2.0	2.1
Other attestation services	0.2	0.2
Tax services	0.1	0.2
Other services	0.1	–
Total	2.4	2.5

The fees for audit services for fiscal 2019 mainly comprise those for the statutory audit of the consolidated financial statements of the Covestro Group, the review of the Covestro Group's interim report for the period ended June 30, 2019, and the audit of the financial statements of Covestro AG and its subsidiaries in Germany.

The fees for other attestation services in fiscal 2019 particularly contain the assurance of sustainability information and special audits concerning energy related topics. Tax services include mainly consultancy services for the preparation of tax reports and matters related to VAT.

30. Events after the End of the Reporting Period

Covestro successfully concluded the sale of its European polycarbonate sheets business to the Munich-based Serafin group on January 2, 2020. Due to impairment losses on the assets of the divested business in the third quarter of 2019 (see note 5.2 "Acquisitions and divestments"), the effect of the sale on earnings was immaterial.

Leverkusen, February 14, 2020

Covestro AG

The Board of Management

RESPONSIBILITY STATEMENT

To the best of our knowledge, and in accordance with the applicable reporting principles for financial reporting, the consolidated financial statements give a true and fair view of the net assets, financial position and results of operations of the Covestro Group, and the group management report, which has been combined with the management report of Covestro AG, includes a fair review of the development and performance of the business and the position of the Covestro Group and Covestro AG, together with a description of the principal opportunities and risks associated with the expected development of the Covestro Group and Covestro AG.

Leverkusen, February 14, 2020

Covestro AG

The Board of Management

Dr. Markus Steilemann
(Chairman)

Sucheta Govil

Dr. Klaus Schäfer

Dr. Thomas Toepfer

INDEPENDENT AUDITOR'S REPORT

To Covestro AG, Leverkusen

Report on the Audit of the Consolidated Financial Statements and of the Combined Management Report

Opinions

We have audited the consolidated financial statements of Covestro AG, Leverkusen, and its subsidiaries (the Group) – which comprise the consolidated income statement and consolidated statement of comprehensive income for the financial year from 1 January 2019 to 31 December 2019, the consolidated balance sheet as at 31 December 2019, and the consolidated statement of cash flows and the consolidated statement of changes in equity for the financial year from 1 January 2019 to 31 December 2019 as well as the notes to the consolidated financial statements, including a summary of significant accounting policies. In addition, we have audited the combined management report of Covestro AG for the financial year from 1 January 2019 to 31 December 2019 including the non-financial statement in accordance with Section 315b (1), 315c HGB [Handelsgesetzbuch: German Commercial Code]. In accordance with German legal requirements, we have not audited the content of those components of the combined management report specified in the "Other Information" section of our auditor's report.

The management report contains cross-references marked as unaudited and not required by law. In accordance with German legal requirements, we have not audited the content of these cross-references or the information to which they refer.

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying consolidated financial statements comply, in all material respects, with the IFRSs as adopted by the EU, and the additional requirements of German commercial law pursuant to Section 315e (1) HGB [Handelsgesetzbuch: German Commercial Code] and, in compliance with these requirements, give a true and fair view of the assets, liabilities, and financial position of the Group as at 31 December 2019, and of its financial performance for the financial year from 1 January 2019 to 31 December 2019, and
- the accompanying combined management report as a whole provides an appropriate view of the Group's position. In all material respects, this combined management report is consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. Our opinion on the combined management report does not cover the content of those components of the combined management report specified in the "Other Information" section of the auditor's report. In accordance with German legal requirements, we have not audited the content of those components of the combined management report specified in the "Other Information" section of our auditor's report. The combined management report contains cross-references marked as unaudited and not required by law. We have not audited the content of these cross-references or the information to which they refer.

Pursuant to Section 322 (3) sentence 1 HGB [Handelsgesetzbuch: German Commercial Code], we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the combined management report.

Basis for the Opinions

We conducted our audit of the consolidated financial statements and of the combined management report in accordance with Section 317 HGB and the EU Audit Regulation No. 537/2014 (referred to subsequently as "EU Audit Regulation") and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). We performed the audit of the consolidated financial statements in supplementary compliance with the International Standards on Auditing (ISAs). Our responsibilities under those requirements, principles and standards are further described in the "Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and of the Combined Management Report" section of our auditor's report. We are independent of the group entities in accordance with the requirements of European law and German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. In addition, in accordance with Article 10 (2) point (f) of the EU Audit Regulation, we declare that we have not provided non-audit services prohibited under Article 5 (1) of the EU Audit Regulation. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinions on the consolidated financial statements and on the combined management report.

Key Audit Matters in the Audit of the Consolidated Financial Statements

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements for the financial year from 1 January 2019 to 31 December 2019. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, we do not provide a separate opinion on these matters.

Recoverability of the carrying amount of goodwill and of assets with determinable useful lives

The accounting policies as well as the assumptions made are disclosed in the notes to the consolidated financial statements in note 3. Disclosure of the amount of goodwill is provided in the notes to the consolidated financial statements in note 13 with explanations with respect to the business development of the operating segments included in the combined management report in the chapter "Business Development by segment".

THE FINANCIAL STATEMENT RISK

In the consolidated financial statements of Covestro AG Goodwill, Other intangible assets, and Property, plant and equipment amount to EUR 5,7 billion in total. These items account for a significant portion of the Group's noncurrent assets and for 49% of the Group's total assets. Of these items, Goodwill amounts to EUR 264 million for the financial year 31 December 2019.

A central impairment test is carried out, when there is an indication of impairment for an asset. Goodwill is tested annually for impairment. To this end, the carrying amount of the individual Cash Generating Units (CGU) is compared with their recoverable amount. If the carrying amount exceeds the recoverable amount of the respective CGU, an impairment is recorded. Initially the impairment reduces the carrying amount of goodwill and then the carrying amount of the other assets of the CGU.

The goodwill impairment test for CGU is complex and is based on a number of judgmental assumptions. These include, among others, the expected business and earnings development of the operating segments for the upcoming years, the assumed long-term growth rates and the discount rate used.

Due to an increase in competition and decline in the economy, future business prospects in the Chemicals sector showed signs of deterioration. Nonetheless, as a result of the impairment test carried out by the company, no need for the recording of an impairment was identified.

There is the risk for the financial statements that required impairments were not identified. In addition, there is the risk that the disclosures in the notes associated herewith are not appropriate.

OUR AUDIT APPROACH

With the support of our valuation specialists, we have assessed the appropriateness of the significant assumptions as well as company's valuation model. This included a discussion of the expected development of the business and results as well as of the assumed underlying long-term growth rates with those responsible for the planning process. In addition, reconciliations were made with other internally available forecasts as well as with the financial planning prepared by the Executive Board and approved by the Supervisory Board. Furthermore, we also assessed the consistency of the assumptions with external market expectations, by utilizing economic reports from recognized industry institutes as well as analyst assessments.

Moreover, we assessed the Company's planning accuracy by comparing projections for previous financial years with the actual results realised and analysed deviations. We have compared the assumptions and parameters underlying the discount rate – in particular the risk-free rate, the market risk premium and the beta factor – with our own assumptions and publicly available information.

To provide for the mathematical accuracy of the valuation model utilised, we recalculated the Company's calculations.

To reflect the existing uncertainty with respect to forecasts as well as the earlier valuation date for the impairment test, we have assessed reasonably possible changes of the discount rate, the expected earnings respectively the long-term growth rate on the recoverable amount (sensitivity analysis) by calculating alternative scenarios and comparing these with the Company's valuation results.

Finally, we assessed whether the disclosures in the notes with respect to the recoverability of the carrying amount of the goodwill are appropriate.

OUR OBSERVATIONS

The underlying valuation model used in the impairment test of goodwill is appropriate and consistent with the applicable accounting principles. The Group's assumptions and parameters underlying the valuation are within an acceptable bandwidth and are, on the whole, acceptable. The disclosures in the notes associated herewith are appropriate.

Other Information

Management and the Supervisory Board are responsible for the other information. The other information comprises:

- the Declaration on Corporate Governance included in the chapter "Declaration on Corporate Governance" of the combined management report, and
- information included in the combined management report that is marked as unaudited.

The other information also includes the remaining parts of the annual report.

The other information does not include the consolidated financial statements, the combined management report information audited for content and our auditor's report thereon.

Our opinions on the consolidated financial statements and on the combined management report do not cover the other information, and consequently we do not express an opinion or any other form of assurance conclusion thereon.

In connection with our audit, our responsibility is to read the other information and, in so doing, to consider whether the other information

- is materially inconsistent with the consolidated financial statements, with the combined management report information audited for content or our knowledge obtained in the audit, or
- otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of Management and the Supervisory Board for the Consolidated Financial Statements and the Combined Management Report

Management is responsible for the preparation of the consolidated financial statements that comply, in all material respects, with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Section 315e (1) HGB and that the consolidated financial statements, in compliance with these requirements, give a true and fair view of the assets, liabilities, financial position, and financial performance of the Group. In addition, management is responsible for such internal control as they have determined necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, management is responsible for the preparation of the combined management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements, and appropriately presents the opportunities and risks of future development. In addition, management is responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of a combined management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient appropriate evidence for the assertions in the combined management report.

The Supervisory Board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the combined management report.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and of the Combined Management Report

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the combined management report as a whole provides an appropriate view of the Group's position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our opinions on the consolidated financial statements and on the combined management report.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Section 317 HGB and the EU Audit Regulation and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) and supplementary compliance with the ISAs will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements and this combined management report.

We exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements and of the combined management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls.
- Obtain an understanding of internal control relevant to the audit of the consolidated financial statements and of arrangements and measures (systems) relevant to the audit of the combined management report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of these systems of the Group.
- Evaluate the appropriateness of accounting policies used by management and the reasonableness of estimates made by management and related disclosures.
- Conclude on the appropriateness of the management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the auditor's report to the related disclosures in the consolidated financial statements and in the combined management report or, if such disclosures are inadequate, to modify our respective opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in a manner that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and financial performance of the Group in compliance with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Section 315e (1) HGB.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express opinions on the consolidated financial statements and on the combined management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our opinions.
- Evaluate the consistency of the combined management report with the consolidated financial statements, its conformity with German law, and the view of the Group's position it provides.
- Perform audit procedures on the prospective information presented by management in the combined management report. On the basis of sufficient appropriate audit evidence we evaluate, in particular, the significant assumptions used by management as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with the relevant independence requirements, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, the related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter.

Other Legal and Regulatory Requirements

Further Information pursuant to Article 10 of the EU Audit Regulation

We were elected as auditor by the annual general meeting on 12 April 2019. We were engaged by the Audit Committee of the Supervisory Board on 25 July 2019. We have been the group auditor of Covestro AG without interruption since financial year 2018.

We declare that the opinions expressed in this auditor's report are consistent with the additional report to the audit committee pursuant to Article 11 of the EU Audit Regulation (long-form audit report).

German Public Auditor Responsible for the Engagement

The German Public Auditor responsible for the engagement is Dr. Markus Zeimes.

Düsseldorf, 17 February 2020

KPMG AG
Wirtschaftsprüfungsgesellschaft
[Original German version signed by:]

Dr. Zeimes
[German Public Auditor]

Geier
[German Public Auditor]