Notes to the balance sheet

(13) PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment is measured at cost of purchase and cost of production in accordance with IAS 16 (Property, Plant and Equipment). Cost of production comprises individual costs as well as indirect costs which are directly allocatable.

If at least two years are required for manufacturing an asset in order to place it in its intended state in which it is capable of being used or sold, any directly attributable costs of debt are capitalized as costs of production of the asset. If a direct link cannot be established, the average cost of debt rate for the year under review is used. Value-added tax incurred in connection with the purchase or production of property, plant and equipment is only capitalized to the extent that authorization to deduct pre-tax is not given.

Subsequent costs are capitalized if the expenses enhance the economic benefit of the property, plant and equipment and if the costs can be reliably measured. Other repairs or maintenance, on the other hand, are generally recognized as an expense.

Components of property, plant and equipment that are significant in relation to the total cost of purchase and cost of production are recognized separately and written down over their useful life using the straight-line method.

Investment grants are deducted directly from the cost of purchase and cost of production of the subsidized assets.

Rights of use from leasing contracts

In the case of rented or leased assets, if they fall under the scope of IFRS 16, a right of use (in accordance with IFRS 16.24) and a lease liability are recognized as soon as the assets are available for use by DB Group. Depreciation is recognized using the straight-line method over the economic useful life of the asset or the shorter duration of the lease. This is not applicable for leasing contracts for minor-value assets (up to and including € 5,000) and short-term leasing contracts with a duration of 12 months or less, the costs of which are recognized on a linear basis in the statement of income. Components of lease payments that do not relate to the use of the asset are not included in the measurement of the right of use and the lease liability.

Critical estimations and assessments

With regard to defining the duration of the lease, management takes account of all facts and circumstances that have an influence on the possible exercising of an extension option or termination option. This assessment is reviewed regularly.

Leased assets

DB Group classifies every lease for which it is the lessor either as an operating lease or as a finance lease. A lease is classified as a finance lease if it transfers essentially all risks and opportunities associated with the ownership. If this is not the case, the lease is classified as an operating lease.

PROPERTY, PLANT AND EQUIPMENT / € million	Land	Commercial, operating and other buildings	Permanent way structures	Track infrastructure, signaling and control equipment	Vehicles for passenger and freight transport	Technical equipment and machinery	Other operating and business equipment	Advance payments and assets under construction	Total
COST OF PURCHASE AND COST OF PRODUCTION									
As of Jan 1, 2022	4,675	13,740	15,928	16,602	38,300	2,294	5,922	7,257	**104,718**
Changes in the scope of consolidation	7	-107	–	–	152	-12	-4	-1	**35**
thereof additions in scope of consolidation	25	39	–	–	424	0	19	1	**508**
thereof disposals in scope of consolidation	-18	-146	–	–	-272	-12	-23	-2	**-473**
Additions	109	1,096	954	1,404	2,084	119	552	8,463	**14,781**
Addition of cost of debt	–	–	–	–	–	–	–	61	**61**
Investment grants	-10	-195	-699	-1,288	-60	-30	-76	-6,239	**-8,597**
Transfers	25	275	13	244	386	37	89	-1,082	**-13**
Transfers of non-current assets held for sale	-5	-69	0	–	-408	-4	-17	-1	**-504**
Changes with no impact on profit and loss	–	1	–	–	–	–	0	–	**1**
Disposals	-32	-226	-7	-272	-764	-55	-340	66	**-1,630**
Currency translation effects	-15	-50	-3	0	-132	-4	-12	-1	**-217**
As of Dec 31, 2022	**4,754**	**14,465**	**16,186**	**16,690**	**39,558**	**2,345**	**6,114**	**8,523**	**108,635**
ACCUMULATED DEPRECIATION									
As of Jan 1, 2022	-677	-6,008	-6,024	-13,012	-23,418	-1,505	-3,966	-8	**-54,618**
Changes in the scope of consolidation	5	76	–	–	55	8	2	–	**146**
thereof additions in scope of consolidation	0	-19	–	–	-105	0	-16	–	**-140**
thereof disposals in scope of consolidation	5	95	–	–	160	8	18	–	**286**
Depreciation	-51	-898	-204	-335	-1,713	-130	-498	–	**-3,829**
Impairments	–	-1	0	0	-3	0	-1	–	**-5**
Reversals	–	–	–	23	0	0	1	–	**24**
Transfers	0	0	0	0	-1	0	3	6	**8**
Transfers of non-current assets held for sale	0	45	0	–	212	2	12	–	**271**
Disposals	9	176	5	262	707	51	303	0	**1,513**
Currency translation effects	2	31	2	0	76	4	8	0	**123**
As of Dec 31, 2022	**-712**	**-6,579**	**-6,221**	**-13,062**	**-24,085**	**-1,570**	**-4,136**	**-2**	**-56,367**
Carrying amount as of Dec 31, 2022	**4,042**	**7,886**	**9,965**	**3,628**	**15,473**	**775**	**1,978**	**8,521**	**52,268**
Carrying amount as of Dec 31, 2021	3,998	7,732	9,904	3,590	14,882	789	1,956	7,249	**50,100**

PROPERTY, PLANT AND EQUIPMENT / € million	Land	Commercial, operating and other buildings	Permanent way structures	Track infrastructure, signaling and control equipment	Vehicles for passenger and freight transport	Technical equipment and machinery	Other operating and business equipment	Advance payments and assets under construction	**Total**
COST OF PURCHASE AND COST OF PRODUCTION									
As of Jan 1, 2021	4,579	12,748	15,788	17,007	36,431	2,214	5,723	5,623	**100,113**
Changes in the scope of consolidation	1	23	–	–	13	1	4	0	**42**
thereof additions in scope of consolidation	1	27	–	–	13	1	4	0	**46**
thereof disposals in scope of consolidation	–	- 4	–	–	–	–	0	–	**- 4**
Additions	122	1,109	806	1,435	2,219	122	524	8,811	**15,148**
Addition of cost of debt	–	–	–	–	–	–	–	50	**50**
Investment grants	0	- 176	- 752	- 1,380	- 42	- 39	- 70	- 6,579	**- 9,038**
Transfers	12	171	101	- 214	403	48	97	- 620	**- 2**
Transfers of non-current assets held for sale	–	–	–	–	–	–	–	–	**–**
Changes with no impact on profit and loss	–	3	–	–	–	–	–	–	**3**
Disposals	- 59	- 200	- 19	- 246	- 852	- 58	- 387	- 34	**- 1,855**
Currency translation effects	20	62	4	0	128	6	31	6	**257**
As of Dec 31, 2021	**4,675**	**13,740**	**15,928**	**16,602**	**38,300**	**2,294**	**5,922**	**7,257**	**104,718**
ACCUMULATED DEPRECIATION									
As of Jan 1, 2021	- 717	- 5,218	- 5,831	- 12,913	- 22,517	- 1,442	- 3,755	- 16	**- 52,409**
Changes in the scope of consolidation	–	2	–	–	0	0	- 2	–	**0**
thereof additions in scope of consolidation	–	- 2	–	–	0	0	- 2	–	**- 4**
thereof disposals in scope of consolidation	–	4	–	–	–	–	0	–	**4**
Depreciation	- 45	- 890	- 203	- 346	- 1,580	- 128	- 496	–	**3,688**
Impairments	- 1	- 2	0	0	- 7	0	- 2	0	**- 12**
Reversals	75	0	–	14	2	–	0	–	**91**
Transfers	- 1	- 20	0	0	2	16	- 14	7	**- 10**
Transfers of non-current assets held for sale	–	–	–	–	–	–	–	–	**–**
Disposals	17	141	13	233	755	54	326	1	**1,540**
Currency translation effects	- 5	- 21	- 3	0	- 73	- 5	- 23	0	**- 130**
As of Dec 31, 2021	**- 677**	**- 6,008**	**- 6,024**	**- 13,012**	**- 23,418**	**- 1,505**	**- 3,966**	**- 8**	**- 54,618**
Carrying amount as of Dec 31, 2021	**3,998**	**7,732**	**9,904**	**3,590**	**14,882**	**789**	**1,956**	**7,249**	**50,100**
Carrying amount as of Dec 31, 2020	3,862	7,530	9,957	4,094	13,914	772	1,968	5,607	**47,704**

The additions to the cost of debt contain an average cost of debt rate of 1.34 % (previous year: 1.44 %).

The impairments of € 5 million (previous year: € 12 million) mainly related to vehicles for passenger and freight transport.

Reversals of € 24 million (previous year: € 91 million) mainly related to track infrastructure of DB Netz AG.

In the year under review, the carrying amount disposals for assets under construction included positive carrying amount disposals of € 75 million (previous year: € 7 million). These were attributable to the repayment of investment grants that had been received in previous years and deducted from assets.

Restrictions to rights of disposal over property, plant and equipment (as of December 31, 2022: € 28 million; as of December 31, 2021: € 34 million) existed mainly in Arriva Italia s.r.l., Milan / Italy.

Rights of use from leases (IFRS 16)

DB Group leases mainly consist of real estate. Compared with a solution involving purchasing of such assets, leasing provides much greater flexibility and results in lower amounts of capital being tied up. DB Group simultaneously participates in positive market developments by regularly agreeing extension options. In addition, DB Group rents rolling stock particularly if the economic useful life considerably exceeds the duration of the transport contract for which the rolling stock is intended.

Property, plant and equipment contains rights-of-use from leases that are shown separately in the following overview:

	Rights of use for							
€ million	Land	Commercial, operating and other buildings	Permanent way structures	Track infra-structure, signaling and control equipment	Vehicles for passenger and freight transport	Technical equipment and machinery	Other operating and business equipment	Total
AS OF DEC 31, 2022								
Additions	58	764	1	1	234	9	25	**1,092**
Depreciation	-42	-661	-2	-1	-223	-32	-17	**-978**
Carrying amount	391	3,492	1	14	615	142	37	**4,692**
AS OF DEC 31, 2021								
Additions	51	788	0	14	199	18	20	**1,090**
Depreciation	-38	-655	-4	-1	-196	-33	-16	**-943**
Carrying amount	377	3,494	2	15	534	165	32	**4,619**

Further details of leasing-related liabilities, expenses and other financial obligations are set out in the Notes (6) 225ff., (7) 228f., (9) 229, (28) 242ff. and (35) 261 as well as the Notes to the statement of cash flows 254.

The decrease in carrying amounts for vehicles for passenger and freight transport mainly resulted from the DB Arriva segment. In the case of commercial, operational and other buildings, as well as new contracts, term extensions in connection with existing real estate contracts resulted in an increase in the carrying amounts.

Rented assets

The rental activities of DB Group related mainly to premises in stations as well as the leasing of excess locomotive and rail car capacities. Agreements are not normally made with regard to assuring any residual values.

Subletting activities are carried out to a minor extent mainly at DB Schenker. Where appropriate, storage facilities are rented only for the purpose of fulfilling a logistics contract with a specific customer. If these customers take on the economic opportunities and risks with regard to the leased premises, the subletting income is not recognized in the income statement; instead, this is recognized as a sub-financing lease. Income from subletting amounted to € 31 million (previous year: € 35 million).

The assets which in certain cases are determined on the basis of retrospective calculations and completed surveys and which are leased by way of operating leases have the following residual carrying amounts:

RENTED ASSETS CLASSIFIED AS OPERATING LEASES / € million	Real estate	Mobile assets
Cost of purchase and cost of production	1,428	6,880
Accumulated depreciation	-511	-4,701
Carrying amount as of Dec 31, 2022	**917**	**2,179**
Cost of purchase and cost of production	1,393	6,889
Accumulated depreciation	-481	-4,580
Carrying amount as of Dec 31, 2021	**912**	**2,309**

The process of renting the assets is expected to generate rental and leasing inflows in future years as shown in the following overview:

EXPECTED RENTAL AND LEASING INCOME (NOMINAL VALUES) / € million	Residual maturity							
	Up to 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	More than 5 years	Total more than 1 year	Total
AS OF DEC 31, 2022								
Minimum lease payments	374	198	178	135	121	473	**1,105**	**1,479**
AS OF DEC 31, 2021								
Minimum lease payments	357	211	178	161	121	518	**1,189**	**1,546**

(14) INTANGIBLE ASSETS

Purchased intangible assets are shown with their acquisition cost in accordance with IAS 38 (Intangible Assets). Intangible assets manufactured in-house are recognized with their cost of production, if the reporting criteria are met, and consist mainly of software.

Costs of production mainly comprise costs for material and services, wage and salary costs as well as relevant indirect costs.

Intangible assets (excluding goodwill and the Arriva brand) are subsequently valued at cost of purchase and cost of production less scheduled amortization and impairments plus any reversals of previous impairments.

INTANGIBLE ASSETS / € million	Capitalized development costs for products currently in use		Capitalized development costs for products under development		Purchased intangible assets		Goodwill		Advance payments		**Total**	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	**2021**
COST OF PURCHASE AND COST OF PRODUCTION												
As of Jan 1	897	766	425	369	2,193	2,196	3,144	3,003	1	1	**6,660**	**6,335**
Changes in the scope of consolidation	- 21	2	0	–	28	26	- 27	17	–	–	**- 20**	**45**
thereof additions in scope of consolidation	1	2	–	–	77	28	53	17	–	–	**131**	**47**
thereof disposals in scope of consolidation	- 22	–	0	–	- 49	- 2	- 80	–	–	–	**- 151**	**- 2**
Additions	37	44	179	174	356	21	–	–	0	0	**572**	**239**
Investment grants	- 2	- 6	- 4	–	0	- 1	–	–	–	–	**- 6**	**- 7**
Transfers	86	138	- 95	- 100	23	- 36	0	–	- 1	–	**13**	**2**
Transfers of non-current assets held for sale	–	–	0	–	- 49	–	- 127	–	–	–	**- 176**	**–**
Changes with no impact on profit and loss	–	–	–	–	–	0	–	–	–	–	**–**	**0**
Disposals	0	- 52	- 22	- 17	- 199	- 41	–	0	0	–	**- 221**	**- 110**
Currency translation effects	- 10	5	0	- 1	- 31	28	- 34	124	–	–	**- 75**	**156**
As of Dec 31	**987**	**897**	**483**	**425**	**2,321**	**2,193**	**2,956**	**3,144**	**0**	**1**	**6,747**	**6,660**
ACCUMULATED AMORTIZATION												
As of Jan 1	- 390	- 298	0	0	- 1,958	- 1,889	- 1,925	- 1,858	–	–	**- 4,273**	**- 4,045**
Changes in the scope of consolidation	12	- 2	–	–	43	- 1	70	–	–	–	**125**	**- 3**
thereof additions in scope of consolidation	0	- 2	–	–	0	- 3	–	–	–	–	**0**	**- 5**
thereof disposals in scope of consolidation	12	–	–	–	43	2	70	–	–	–	**125**	**2**
Depreciation	- 89	- 81	–	–	- 82	- 112	–	–	–	–	**- 171**	**- 193**
Impairments	- 3	- 2	–	–	- 1	0	- 13	–	–	–	**- 17**	**- 2**
Reversals	–	–	–	–	–	–	–	–	–	–	**–**	**–**
Transfers	–	- 26	–	–	- 8	36	–	–	–	–	**- 8**	**10**
Transfers of non-current assets held for sale	–	–	–	–	42	–	127	–	–	–	**169**	**–**
Disposals	0	22	–	–	199	34	–	–	–	–	**199**	**56**
Currency translation effects	5	- 3	–	–	21	- 26	57	- 67	–	–	**83**	**- 96**
As of Dec 31	**- 465**	**- 390**	**0**	**0**	**- 1,744**	**- 1,958**	**- 1,684**	**- 1,925**	**–**	**–**	**- 3,893**	**- 4,273**
Carrying amount as of Dec 31	**522**	**507**	**483**	**425**	**577**	**235**	**1,272**	**1,219**	**0**	**1**	**2,854**	**2,387**
Carrying amount as of Dec 31 of previous year	507	468	425	369	235	307	1,219	1,145	1	1	**2,387**	**2,290**

The acquired intangible assets included an amount of € 340 million (previous year: € 2 million) for claims from capital expenditures made for a transport contract that are to be taken into account in accordance with IFRIC 12. Software is also recorded under this item (carrying amount as of December 31, 2022: € 92 million; as of December 31, 2021: € 103 million), concessions and rights (carrying amount as of December 31, 2022: € 69 million; as of December 31, 2021: € 51 million) and acquired customer and franchise contracts (carrying amount as of December 31, 2022: € 54 million; as of December 31, 2021: € 79 million).

For the acquired Arriva brand (carrying amount as of December 31, 2022: € 27 million; as of December 31, 2021: € 32 million), there are no other legal, regulatory, contractual, competitive, economic or other factors that limit the useful life.

The impairments of € 17 million (previous year: € 2 million) were in the DB Cargo, DB Regional and Subsidiaries / Other segments.

The allocation of the reported goodwill to the segments is shown in Segment information according to segments 214f.

(15) INVESTMENTS ACCOUNTED FOR USING THE EQUITY METHOD

Shares in associated companies and joint ventures are accounted for using the equity method in accordance with IAS 28. The carrying amount, based on the Group costs of purchase at the time of the purchase, is updated according to the DB Group share of changes in equity position of the company accounted for using the equity method.

The shares in the investments accounted for using the equity method have developed as follows:

million	**2022**	2021
As of Jan 1	461	458
Additions	0	0
Disposals	- 20	0
Share of DB Group in profit	11	8
Capital increase	3	1
Other movements in capital	- 2	–
Dividends received	- 9	- 9
Impairments	0	–
Reversals	11	–
Currency translation effects	0	0
Other valuation	- 9	3
As of Dec 31	**446**	**461**

The figure shown in the balance sheet as of December 31, 2022, was mainly attributable to the shares held in the associated companies EUROFIMA European Company for the Financing of Railroad Rolling Stock (EUROFIMA), Basel / Switzerland and Trieste Trasporti S.P.A., Trieste / Italy. The shares in EUROFIMA are subject to restrictions in terms of being sold; new shareholders must be railway administration entities which also require a guarantee from their respective state guaranteeing their obligations.

(16) DEFERRED TAXES

Deferred taxes are calculated in accordance with IAS 12 (Income Taxes).

The theoretical income tax rate for corporations of 30.5% is used as the basis for calculating deferred taxes for domestic companies. The income tax rate comprises the corporation tax rate plus solidarity surcharge and an average trade tax rate. Foreign subsidiaries use their relevant local tax rates for calculating deferred taxes.

A deferred tax asset is recognized in accordance with IAS 12.24 or IAS 12.34 if, after corresponding deferred tax liabilities have been deducted, it is likely that adequate taxable income is available. This is based on the mid-term planning and a further year, taking into account supplementary estimates for domestic companies. The international companies use medium-term planning as the basis. Deferred tax assets relating to income which can be generated after the forecast period are not recognized, on the grounds that they cannot be reliably determined.

Deferred taxes are established on the basis of the tax rates that can be expected for the period in which the deferred tax is realized on the basis of existing laws or laws that have in essence been adopted.

Critical estimations and assessments

The calculation of deferred tax assets is based on the medium- and long-term planning. If the sum of net profits planned in the medium-term planning were to decline by 10% in conjunction with otherwise unchanged tax parameters, deferred tax assets would have to be reduced by € 14 million (previous year: € 100 million).

Deferred tax assets are broken down as follows:

AS OF DEC 31 / € million	2022	2021
Deferred tax assets in respect of temporary differences	343	443
Deferred tax assets in respect of tax losses carried forward	167	862
Total	**510**	**1,305**

No deferred tax assets have been created in relation to the following losses carried forward and temporary differences:

AS OF DEC 31 / € million	2022	2021
Tax loss carry-forwards for which no deferred tax asset has been created	23,531	20,514
Temporary differences for which no deferred tax asset has been created	2,853	5,653
Temporary differences that are not permitted to be recognized in accordance with IAS 12.24b in conjunction with 12.33	1,771	1,868
Total	**28,155**	**28,035**

The losses carried forward are mainly attributable to the tax law treatment of Federal grants paid in the past to DB AG in accordance with section 21 (5) and section 22 (1) Deutsche Bahn Foundation Act (Deutsche Bahn Gründungsgesetz; DBGrG) as a contribution as well as further tax losses in recent years.

On the basis of current law, the domestic losses carried forward are fully permissible in accordance with current legislation (in terms of the actual amount and justification).

The temporary differences which are not permitted to be recognized in accordance with IAS 12.33 relate exclusively to additional tax depreciation from previously received tax-free investment grants.

The following deferred tax assets and deferred tax liabilities shown in the balance sheet were due to statement and valuation differences for the individual balance sheet items and tax losses carried forward:

	Deferred tax assets		Deferred tax liabilities	
AS OF DEC 31 / € million	2022	2021	2022	2021
NON-CURRENT ASSETS				
Property, plant and equipment	80	108	122	153
Intangible assets	0	0	25	34
CURRENT ASSETS				
Trade receivables	7	11	5	4
NON-CURRENT LIABILITIES				
Financial debt	0	2	0	0
Derivative financial instruments	0	7	0	0
Pension obligations	83	140	5	3
Other provisions	133	177	181	131
CURRENT LIABILITIES				
Trade liabilities	76	68	0	0
Other liabilities	29	32	0	0
Other provisions	43	67	11	12
Losses carried forward	167	862	0	0
Subtotal	**618**	**1,474**	**349**	**337**
Balancing [1]	-108	-169	-108	-169
Amount stated in the balance sheet	**510**	**1,305**	**241**	**168**

[1] To the extent permitted by IAS 12 (income taxes).

Tax assets and liabilities are netted if they exist in relation to the same tax authority, if they are of congruent maturity and if they relate to the same tax subject.

Of the deferred tax assets of € 618 million (as of December 31, 2021: € 1,474 million), € 147 million (as of December 31, 2021: € 177 million) will probably be realized in the course of the next 12 months. Of the deferred tax liabilities of € 349 million (as of December 31, 2021: € 337 million), € 11 million (as of December 31, 2021: € 16 million) will probably be realized in the course of the next 12 months.

The deferred taxes recognized in the balance sheet include deferred tax assets, set up with no impact on profit and loss, of € 71 million (as of December 31, 2021: € 222 million) and deferred tax liabilities, set up with no impact on profit and loss, of € 8 million (as of December 31, 2021: € 7 million).

(17) OTHER INVESTMENTS AND SECURITIES

Other investments are accounted for at fair value if the relevant information can be derived. Changes in the fair value with no impact on profit and loss are shown in the "Fair value securities and equity investments" reserve.

Long- or short-term securities are recognized at their fair values as of the balance sheet date – where such values exist. Changes in fair value are taken into account with no impact on profit and loss in the reserve from the fair value assessment of securities.

Other investments and securities developed as follows:

€ million	Other investments 2022	Other investments 2021	Securities 2022	Securities 2021	Total 2022	Total 2021
As of Jan 1	97	55	3	3	**100**	**58**
Currency translation effects	0	0	0	0	**0**	**0**
Additions	8	18	501	–	**509**	**18**
Disposals	-3	-7	0	0	**-3**	**-7**
Fair value changes	30	31	0	0	**30**	**31**
Other	0	0	–	–	**0**	**0**
As of Dec 31	**132**	**97**	**504**	**3**	**636**	**100**
thereof at cost/ acquisition cost	–	–	0	1	**0**	**1**
thereof fair value (with no impact on profit and loss)	31	29	2	2	**33**	**31**
thereof fair value (recognized in the income statement)	101	68	502	–	**603**	**68**
Non-current share	132	97	2	2	**134**	**99**
Current share	–	–	502	1	**502**	**1**

In the year under review, fair value changes resulted in other investments amounting to € 30 million (previous year: € 31 million). As in the previous year, these related almost exclusively to the revaluation of the shares in Volocopter GmbH, Bruchsal.

Additions to other investments at fair value related to € 2 million to Teralytics Holding AG, Zurich/Switzerland, and € 1 million each to Liefergrün GmbH, Münster, Utilities Allianz 450 Beteiligungs GmbH&Co. KG, Bonn, Maniv Mobility II A, L.P., Santa Clara/USA, and Brighter AI Technologies GmbH, Berlin.

The additions within the securities mainly related to acquisitions of money-market funds by DB AG. Money market funds are available on a daily basis and are comparable in liquidity to cash and cash equivalents. Due to potential risks of changes in value, they are recognized under other investments.

(18) INVENTORIES

All costs which are directly related to the procurement process are capitalized as the acquisition costs of the inventories. The average method is used as the basis for establishing the acquisition cost of fungible and homogeneous raw materials and supplies. The costs of production comprise the individual costs and also the directly attributable indirect costs; borrowing costs and idle costs are not capitalized, and instead are recognized as expense in the period in which they are incurred.

As of the balance sheet date, inventories are measured with the lower of cost or net realizable value.

CO_2 certificates are also shown in inventories.

Inventories are broken down as follows:

AS OF DEC 31 / € million	2022	2021
Raw materials, consumables and supplies	2,256	2,062
Unfinished goods, unfinished services	139	128
Finished goods and products	145	413
Advance payments	0	11
Impairments	-464	-459
Total	**2,076**	**2,155**

The increase in raw materials, consumables and supplies was attributable, among other things, to price increases for CO_2 certificates.

The decline in finished products and goods mainly resulted in the DB Schenker segment as a result of the sale of the MTS-Markentechnik Group and in the DB Regional segment.

(19) RECEIVABLES AND OTHER ASSETS

In general, receivables and other financial assets are measured at amortized acquisition cost. Finance lease receivables, advance payments made and plan assets in accordance with IAS 19 (Employee Benefits) are not allocated to any category of IFRS 9. With regard to the measurement categories according to IFRS 9 (Additional disclosures relating to the financial instruments 260).

For trade receivables, DB Group uses the simplified approach according to IFRS 9 in order to measure the risk provision for the expected loan losses. Accordingly, for all trade receivables, the loan losses expected over the life of the receivables are used for this purpose. To this end, trade receivables were initially allocated to various collectives on the basis of common credit risk characteristics. The expected credit losses were then estimated using impairment rates that take into account past data and country-specific future-related risk characteristics.

For receivables from financing, other financial receivables and contractual assets, DB Group uses the general approach under IFRS 9 to measure the expected loan losses. Receivables for which objective indications of impairment are available are individually impaired.

Any impairments that are recognized are deducted from financial assets on the assets side of the balance sheet. Previous impairments are reversed if the reasons for the original impairments are no longer applicable. In DB Group, the maturities of the receivables and default risks are monitored constantly.

Some transport contracts include a handover obligation specifying that the deployed assets owned by DB Group have to be handed over at the end of the contract. Other transport contracts include a clause specifying that the deployed assets have to be rented from the contracting organization or a capital service guarantee is to be provided by the contracting organization for leasing from independent financial service providers. In accordance with IFRIC 12 (Service Concession Arrangements), the corresponding capital expenditures are capitalized as receivables from transport concession arrangements at the end of the contract, with the guaranteed residual values being separated. The receivables are redeemed out of the concession fees, which means that not all of the concession fees result in revenues. The residual value receivables are disclosed at their present value under the financing receivables.

Critical estimations and assessments

The calculation of expected credit losses to a considerable extent comprises assessments and appraisals that are based on the creditworthiness of the particular customer, current economic developments as well as an analysis of historical bad debts at the portfolio level. If the provision for expected credit losses is derived on the basis of historical default rates at the portfolio level, any decline in the overall volume of receivables results in a corresponding decrease in such provisions (and vice versa).

The receivables and other assets are broken down as follows:

€ million	Trade receivables	Financial receivables and ear-marked bank balances	Receivables from transport concessions	Advance payments	Other assets	Total
AS OF DEC 31, 2022						
Gross value	6,517	1,033	855	343	2,878	**11,626**
Impairments	- 163	- 10	–	–	- 43	**- 216**
Net value	**6,354**	**1,023**	**855**	**343**	**2,835**	**11,410**
thereof due to related parties	41	2	–	0	221	**264**
AS OF DEC 31, 2021						
Gross value	6,681	875	682	304	1,972	**10,514**
Impairments	- 182	- 11	–	–	- 46	**- 239**
Net value	**6,499**	**864**	**682**	**304**	**1,926**	**10,275**
thereof due to related parties	38	2	–	0	310	**350**

Commitments and claims from the independent acknowledgement of debt have been recognized in the balance sheet since the year under review. This resulted in an extension of the balance sheet of € 771 million in total for the other assets. The commitments correspond to equal amounts of receivables from supply contracts, hedged by bank guarantees, in the event of a claim.

DB Group concluded factoring agreements with a bank; according to the terms of this agreement, the bank is obliged to purchase on a revolving basis current trade receivables (denominated in euro and Swedish krona) in companies of the DB Schenker segment up to a maximum volume of € 695 million (previous year: € 703 million) and under which rights or obligations remain with DB Group. The agreement has been concluded for an indefinite period of time. DB Group will continue to be responsible for sales ledger accounting and the dunning system on behalf of the bank until further notice. The risks relating to the receivables that are sold and that are relevant for the risk assessment are the credit risk and the risk of late payment. The purchase price is equivalent to the nominal amount. DB Group bears credit-risk-related default and late payment risks from the various tranches up to a certain amount in each case. The other bad debts related to the credit risk are borne by the bank. Virtually none of the opportunities and risks associated with the receivables have been transferred or retained (breakdown of major risks between DB Group and bank).

For some of the receivables, the right of disposal over the receivables that have been sold has been transferred to the bank as the bank has the actual ability to sell on the receivables. These receivables have been completely derecognized.

Disclosures on DB Group's continuing involvement in fully derecognized trade receivables:

€ million	2022	2021
Receivables sold as of Dec 31	260	260
Carrying amount of liabilities recorded in the balance sheet, which represent the sustained exposure as of Dec 31 [1]	0	0
Maximum risk of loss from sustained exposure to credit and late payment risks as of Dec 31	74	63
EFFECTS ON THE CONSOLIDATED STATEMENT OF INCOME		
Expenses in the year under review [2]	2	1
Expenses accumulated since the start of the contract [2]	7	5
Expenses from the transfer within the scope of the factoring agreement [2]	1	1

1) Essentially corresponds to the fair value.
2) Previous years' figures adjusted.

DB Group continues to account for the remainder of the trade receivables transferred under factoring agreements for which the power of disposal does not pass to the bank in the amount of its continued commitment, i.e. the maximum amount in which DB Group is still liable for the credit risk and the late payment risk of the sold receivable, and has a corresponding obligation within the other liabilities (continuing involvement). The receivables and the associated liabilities are derecognized to the extent that DB Group's sustained exposure is reduced due to the receipt of payments from customers.

Disclosures on DB Group's sustained exposure in partially derecognized trade receivables:

AS OF DEC 31 / € million	2022	2021
Receivables sold as of Dec 31	435	443
Remaining carrying amount of transferred receivables as of Dec 31 [1]	114	97
Carrying amount of the associated liabilities as of Dec 31 [1]	126	107
EFFECTS ON THE CONSOLIDATED STATEMENT OF INCOME		
Expenses in the year under review [2]	4	2
Expenses accumulated since the start of the contract [2]	13	9
Expenses from the transfer within the scope of the factoring agreement [2]	2	2

1) The fair values of the receivables and the associated liabilities essentially correspond to their carrying amounts.
2) Previous years' figures adjusted.

Purchase price payments received by the bank in the year under review increased the cash flow from operating activities.

The financial receivables and earmarked bank deposits include residual values agreed with the public transport authorities of transport contracts of € 470 million (as of December 31, 2021: € 321 million). These residual value receivables mainly relate to rolling stock that is sold for a fixed price at the end of the transport contract to the public transport authority or to a third party designated by the public transport authority. In addition, financial receivables and earmarked bank deposits also disclosed a figure of € 340 million for finance lease receivables (as of December 31, 2021: € 323 million) as well as a figure of € 27 million for earmarked funds (as of December 31, 2021: € 35 million) which can be used only as contributions for certain retirement benefit plans. A further € 142 million (as of December 31, 2021: € 83 million) relate to cash guarantees in the form of credit support agreements (CSA).

The other assets include contract fulfillment costs of € 6 million (December 31, 2021: € 13 million).

The recognized impairments for the financial instruments classified in accordance with IFRS 7 have developed as follows:

€ million	Trade receivables	Financial receivables and earmarked bank deposits	Receivables from transport concessions	Other assets	Total
As of Jan 1, 2022	- 182	- 11	0	- 46	**- 239**
Additions	- 22	0	–	- 3	**- 25**
Reversals	28	–	0	4	**32**
Amounts used	4	–	–	2	**6**
Changes in the scope of consolidation	9	–	–	0	**9**
Currency translation effects	0	1	–	0	**1**
As of Dec 31, 2022	**- 163**	**- 10**	**–**	**- 43**	**- 216**
As of Jan 1, 2021	- 164	- 11	0	- 47	**- 222**
Additions	- 55	–	–	- 5	**- 60**
Reversals	28	0	0	3	**31**
Amounts used	8	–	–	2	**10**
Changes in the scope of consolidation	0	–	–	–	**0**
Currency translation effects	1	–	–	1	**2**
As of Dec 31, 2021	**- 182**	**- 11**	**0**	**- 46**	**- 239**

Expenses decreased to € 50 million in the year under review for the complete derecognition of receivables and other assets (previous year: € 51 million).

Income of € 4 million was reported for payments received in relation to previously derecognized receivables and other assets (previous year: € 5 million).

The expected loan losses amounted to € 32 million as of December 31, 2022 (as of December 31, 2021: € 31 million).

AS OF DEC 31 / € million	Net carrying amount	Expected loss rate (%)	Risk provisioning	thereof risk provisioning for overdue receivables	thereof risk provisioning for non-overdue receivables
Trade receivables	6,354	0.50	32	19	13

As of December 31, 2022, a risk provision of € 3 million was formed for receivables from financing, other financial receivables and contractual assets (as of December 31, 2021: € 3 million).

The following overview shows the maturity structure of the receivables for the financial instruments classified in accordance with IFRS 7 and the advance payments that have been made:

€ million	Residual maturity							
	Up to 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	More than 5 years	Total more than 1 year	Total
AS OF DEC 31, 2022								
Trade receivables	6,334	5	5	10	0	0	**20**	**6,354**
Financial receivables and earmarked bank deposits	341	58	42	36	26	520	**682**	**1,023**
Receivables from transport concessions	78	87	77	76	76	461	**777**	**855**
Advance payments	278	65	–	–	–	–	**65**	**343**
Other assets	2,106	218	235	154	43	79	**729**	**2,835**
Total	**9,137**	**433**	**359**	**276**	**145**	**1,060**	**2,273**	**11,410**
thereof non-financial assets	1,160	231	167	153	42	77	**670**	**1,830**
AS OF DEC 31, 2021								
Trade receivables	6,476	14	4	4	1	0	**23**	**6,499**
Financial receivables and earmarked bank deposits	341	84	37	32	27	343	**523**	**864**
Receivables from transport concessions	68	65	61	59	58	371	**614**	**682**
Advance payments	243	61	–	–	–	–	**61**	**304**
Other assets	1,706	60	32	19	2	107	**220**	**1,926**
Total	**8,834**	**284**	**134**	**114**	**88**	**821**	**1,441**	**10,275**
thereof non-financial assets	633	68	2	3	1	106	**180**	**813**

The trade receivables decreased slightly compared with the previous year. The decline in the DB Schenker segment was partially offset by increases in the DB Regional, DB Cargo and Subsidiaries/Other segments.

The increase in other current assets resulted in particular from the first-time capitalization of claims from independent debt recognitions and an increase in the Subsidiaries/Other segment.

As a result of the large number of customers in the various operating segments, there is no evidence of concentration of credit risks with trade receivables.

The fair values of the balance sheet items receivables and other assets, trade receivables, as well as other receivables and assets essentially correspond to the carrying amounts.

The maximum default risk is essentially equivalent to the carrying amount in each case. Collateral is not regularly held.

As of the balance sheet date, there were no indications that debtors of the receivables that are neither impaired nor overdue will not meet their payment obligations.

(20) INCOME TAX RECEIVABLES

The income tax receivables relate to advance payments that have been made as well as allowable withholding taxes.

(21) DERIVATIVE FINANCIAL INSTRUMENTS

Upon conclusion of a contract, derivative financial instruments are generally classified as hedging instruments for hedging the cash flows from contractual obligations or anticipated transactions (cash flow hedge).

Cash flow hedges

Cash flow hedges are used to provide protection against fluctuations in the cash flows of financial assets or liabilities or anticipated transactions. When future cash flows are hedged, the hedging instruments are also recognized with their fair value. Changes in value are initially recognized in other comprehensive income with no impact on profit and loss, and are only recognized in the statement of income at the point at which the corresponding losses or profits from the underlying transaction have an impact on the statement of income or the transactions expire. Any ineffectiveness is recognized in the statement of income in accordance with IFRS 9.

Fair value hedges

Fair value hedges are used to hedge assets or liabilities against the risk of a change in fair value. The results from the hedging instruments are reported in the consolidated statement of income, in which also the hedged underlying transaction is shown.

Derivative financial instruments that do not meet the requirements for accounting for hedging transactions in accordance with IFRS 9

If hedges that in economic terms are used for interest, currency or price hedging do not satisfy the requirements of IFRS 9 for being recognized as a hedge, the changes in fair value are immediately recognized in the statement of income.

Calculation of the fair value

The fair value of financial instruments that are traded in an active market is derived from the share price applicable on the balance sheet date. Common valuation methods such as option price or present value models are used for determining the fair value of financial instruments which are not traded in an active market. If valuation-relevant parameters are not directly observable on the market, forecasts are used based on comparable financial instruments that are traded in an active market; these forecasts are then adjusted by premiums or discounts on the basis of historical data. The mean value of bid and offer rates is used. DB AG operates with long-dated financial derivatives on a hedged basis, and does not perform any credit risk adjustment for the fair value for hedged transactions. For considerations of materiality, no credit risk adjustment is used for short-term derivatives. If credit risk adjustment is used, the relevant discounts are derived from the credit default swap (CDS) figures observable on the market.

All derivatives used in DB Group are measured using common methods such as option price or present value models, because their fair values are not traded on an active market. No parameters from non-observable markets are used for assessment purposes.

The volume of hedges that have been taken out is shown in the following overview of nominal values:

AS OF DEC 31 / € million	Nominal value of hedging instrument 2022	2021	Residual maturity up to 1 year 2022	2021	Residual maturity more than 1 year 2022	2021
INTEREST-BASED CONTRACTS						
Interest swaps	800	–	–	–	800	–
	800	**–**	**–**	**–**	**800**	**–**
CURRENCY-BASED CONTRACTS						
Currency swaps	260	803	260	803	0	0
Currency forwards	2,704	2,365	2,675	2,334	29	31
Cross-currency swaps	8,925	8,181	622	176	8,303	8,005
	11,889	**11,349**	**3,557**	**3,313**	**8,332**	**8,036**

AS OF DEC 31 / 1,000 t	Volume 2022	2021	Residual maturity up to 1 year 2022	2021	Residual maturity more than 1 year 2022	2021
OTHER CONTRACTS						
Diesel	428	364	94	26	334	338
Hard coal	1,380	1,408	1,092	928	288	480

Interest rate swaps were concluded to hedge interest rate risks. The changes in holdings of currency swaps and forwards vary in line with the corresponding hedging requirements of the subsidiaries. The nominal value of the interest-rate currency swaps rose by € 744 million, due in part to issues of foreign currency bonds in the year under review, the cash flows of which were exchanged for euros.

The scope of diesel hedges increased moderately due to higher levels of hedging. As of December 31, 2022, coal hedges remained unchanged at 1.4 million t.

The following table shows the average hedging prices / hedging rates for the main derivative hedging instruments of DB Group (per currency):

	Hedging price per 1,000 t		Hedging rate			
Currency	Diesel	Hard coal	Cross-currency swaps (CCS)	Interest rate swaps (IRS)	Currency swaps	Currency forwards
EUR	657.29	166.01	–	0.02	–	–
USD	–	–	1.13	–	1.05	1.07
GBP	578.03	–	0.87	–	–	0.87
CHF	–	–	1.12	–	–	0.99
JPY	–	–	119.66	–	–	143.56
NOK	–	–	9.18	–	–	10.52
SEK	–	–	10.16	–	–	10.98
DKK	3,010.00	–	7.45	–	–	7.44
CAD	–	–	–	–	–	1.45
AUD	–	–	1.55	–	–	1.57
NZD	–	–	1.65	–	–	1.66
HKD	–	–	–	–	–	8.22
MXN	–	–	–	–	–	21.05
SGD	–	–	1.56	–	1.42	1.43
PLN	4,237.35	–	4.41	–	–	4.73
CZK	17,058.50	–	26.08	–	–	25.05
HUF	–	–	–	–	–	425.73
RON	–	–	4.85	–	4.96	4.93
HRK	–	–	7.42	–	–	–
CNY	–	–	–	–	–	7.45
ILS	–	–	–	–	–	3.61
SAR	–	–	4.29	–	–	3.98
AED	–	–	4.25	–	–	3.91
ZAR	–	–	–	–	–	18.32
RUB	–	–	–	–	–	–

All derivative financial instruments are marked-to-market on the reporting date. The following overview shows the allocation of the item stated in the balance sheet depending on the type of underlying hedge:

	Assets		Liabilities	
AS OF DEC 31 / € million	2022	2021	2022	2021
INTEREST-BASED CONTRACTS				
Interest swaps	–	–	78	–
Interest forwards	0	–	–	–
	0	**–**	**78**	**–**
CURRENCY-BASED CONTRACTS				
Currency swaps	0	6	4	1
Currency forwards	26	15	12	7
Other currency derivatives	0	0	0	0
Cross-currency swaps	608	313	239	209
thereof effects from currency hedges	429	375	222	128
	634	**334**	**255**	**217**
OTHER CONTRACTS				
Energy price derivatives	114	72	72	2
	114	**72**	**72**	**2**
Total	**748**	**406**	**405**	**219**
Non-current share	559	356	329	200
Interest-based contracts	–	–	78	0
Currency-based contracts	507	314	225	198
Other contracts	52	42	26	2
Current share	189	50	76	19

Cash flow hedges

In order to minimize the interest rate and exchange rate risk, foreign currency issues as well as intra-Group foreign currency loans are converted into euros as a matter of principle, and floating-rate financial liabilities are generally converted into fixed-interest financial liabilities. Energy price hedging served to reduce price fluctuations attributable to energy sourcing.

The performance of the interest rate currency swaps was mainly based on the development of interest rates in the individual currencies, in particular against the Swiss franc and the Norwegian krone, as well as the devaluation of the euro against the Swiss franc. The appreciation of the euro against the British pound and the Swedish krona had a partially compensating effect.

The positive market value of the energy price derivatives reflected the development on the underlying raw materials markets.

The fair values of the cash flow hedges are shown as follows under assets and liabilities:

	Assets		Liabilities	
AS OF DEC 31 / € million	2022	2021	2022	2021
INTEREST-BASED CONTRACTS				
Interest swaps	–	–	–	–
	–	**–**	**–**	**–**
CURRENCY-BASED CONTRACTS				
Currency swaps	0	6	4	1
Cross-currency swaps	608	313	223	189
	608	**319**	**227**	**190**
OTHER CONTRACTS				
Energy price derivatives	114	72	72	2
Miscellaneous / other derivatives	–	–	0	0
	114	**72**	**72**	**2**
Total	**722**	**391**	**299**	**192**
Non-current share	558	355	235	179
Interest-based contracts	–	–	–	–
Currency-based contracts	506	313	209	177
Other contracts	52	42	26	2
Current share	164	36	64	13

Cash flow hedges are not classified under any category of IFRS 9.

The hedged cash flows of the underlying transactions will probably materialize, and have an impact on the income statement, in 2023 to 2042 (interest payments and payments of principal) or in 2023 to 2026 (payments for energy).

The underlying and hedging transactions, as well as the hedge reserve of cash flow hedges, developed as follows:

	2022		As of Dec 31, 2022	2021		As of Dec 31, 2021
€ million	Changes in hedges and underlying transactions	thereof ineffective (with impact on income statement)	Status of the hedging reserve cash flow hedges	Changes in hedges and underlying transactions	thereof ineffective (with impact on income statement)	Status of the hedging reserve cash flow hedges
INTEREST-BASED CONTRACTS						
Interest swaps	–	–	–	–	–	–
CURRENCY-BASED CONTRACTS						
Currency swaps	-9	–	+2	+18	–	–
Cross-currency swaps	+262	+3	+152	+232	-7	-153
OTHER CONTRACTS						
Energy price hedges	-28	–	+38	+137	–	+66

In the case of interest and cross-currency hedges, the effectiveness of the hedge is assessed using the critical terms match method. This method is used because the major valuation parameters of the underlying transaction and hedges are identical. Ineffectiveness is measured as of every balance sheet date by means of the hypothetical derivative method. In this method, the development in value of the hedge which is actually taken out is compared with the development in value of a theoretical hedge in which all valuation-relevant parameters are identical to those of the underlying transaction. In the case of energy price derivatives, the effectiveness of the hedge is assessed using the linear regression. The ineffectiveness is calculated using the dollar-offset method. In this case, the fair value changes of the underlying transactions are compared with the fair value changes of the hedging instrument. The resultant quotient determines the ineffectiveness.

As in the previous year, in the year under review the inefficiencies of cash flow hedges of the energy price derivatives recognized in the income statement were immaterial.

Fair value hedge derivatives

The fair values are shown under assets and liabilities as follows:

AS OF DEC 31 / € million	Assets 2022	Assets 2021	Liabilities 2022	Liabilities 2021
INTEREST-BASED CONTRACTS				
Interest swaps	–	–	78	–
Total	**–**	**–**	**78**	**–**
Non-current share	–	–	78	–
Interest-based contracts	–	–	78	–
Current share	–	–	–	–

The interest rate swaps were used to hedge issued senior bonds (included in the balance sheet item financial liabilities) with a nominal value of € 800 million. The effectiveness of the hedging relationship was checked using the critical terms match method. There was no ineffectiveness in the year under review.

In addition to rising interest rates in the Eurozone, the performance of the interest rate swaps is due to the conclusion of interest rate swaps in the year under review.

Non-hedge derivatives

Currency forwards taken out to hedge operations are normally classified as non-hedge derivatives.

The fair values of the non-hedge derivatives are shown under assets and liabilities as follows:

AS OF DEC 31 / € million	Assets 2022	Assets 2021	Liabilities 2022	Liabilities 2021
INTEREST-BASED CONTRACTS				
Interest forwards	–	–	–	–
	–	**–**	**–**	**–**
CURRENCY-BASED CONTRACTS				
Currency forwards	26	15	12	7
Other currency derivatives	0	0	0	0
Cross-currency swaps	–	–	16	20
	26	**15**	**28**	**27**
OTHER CONTRACTS				
Energy price derivatives	–	–	–	–
	–	**0**	**–**	**–**
Total	**26**	**15**	**28**	**27**
Non-current share	1	1	16	21
Currency-based contracts	1	1	16	21
Current share	25	14	12	6

The cross-currency swaps are based on a redesignation of hedges as a result of the transfer of transactions between banks. The conditions including the cash flows of the derivatives were unchanged and the economic hedge is thus still in place. The decline was attributable to the reversal of the redesignated amounts in line with the remaining maturities of the swaps.

The non-hedge derivatives are classified under the "held-for-trading" category of IFRS 9.

(22) CASH AND CASH EQUIVALENTS

This item comprises cash in hand and checks, deposits at banks that are due on sight, as well as time deposits with a maturity of up to three months.

Cash and cash equivalents are recognized with their nominal value (at amortized cost).

Cash and cash equivalents are broken down as follows:

AS OF DEC 31 / € million	2022	2021
Cash in hand and bank deposits	5,137	4,591
Cash equivalents	1	0
Total	**5,138**	**4,591**

The interest rates for short-term bank deposits were in a range of between −0.58% and 2.00% (previous year: −0.67% to 0.01%) and relate to euro-denominated cash investments. The durations of the investments are between one day and three months.

For a definition of cash and cash equivalents, please refer to section Notes to the statement of cash flows 254.

(23) NON-CURRENT ASSETS AND LIABILITIES HELD FOR SALE IN CONNECTION WITH ASSETS HELD FOR SALE

Under IFRS 5, non-current assets are classified as held-for-sale non-current assets if their carrying amount is to be realized by way of sale and not by way of continued use. This can be an individual asset, a disposal group or business unit of a company. Non-current held-for-sale assets are measured at the lower of the carrying amount or the fair value, less costs of disposal incurred.

Non-current assets and liabilities held for sale in connection with assets held for sale have developed as follows:

€ million	2022 As of Jan 1	2022 Addition	2022 As of Dec 31
Property, plant and equipment	–	36	36
Intangible assets	–	7	7
Shares in companies accounted for using the equity method	–	0	0
Available for sale financial assets	–	0	0
Inventories	–	17	17
Receivables and other assets	0	75	75
Cash and cash equivalents	–	14	14
Deferred tax assets	–	3	3
Assets	**0**	**152**	**152**
Financial debt	–	30	30
Other liabilities	–	69	69
Pension obligations	–	0	0
Other provisions	–	58	58
Deferred income	–	2	2
Deferred tax liabilities	–	2	2
Liabilities	**–**	**161**	**161**

The assets and liabilities related to the companies held for sale from the DB Arriva segment (in Denmark, Poland and Serbia) and the DB Schenker segment (in Russia). Impairment expenses totaling € 198 million were incurred in this context, which were recognized under other operating expenses.

(24) SUBSCRIBED CAPITAL

The share capital of DB AG is € 2,150 million. It consists of 430,000,000 no-par-value bearer shares. All shares are held by the Federal Republic of Germany.

(25) RESERVES

a) Capital reserves

Capital reserves comprise reserves that have not been part of profits. In the year under review, payments were made by the Federal Government to the capital reserve due to damage compensation for Covid-19 damage, approved by the European Commission in 2020 and 2021. There was a payment of € 88 million for damages to DB Cargo AG, a payment of € 215 million for damages to the infrastructure companies DB Netz AG, DB Station&Service AG and DB Energie GmbH, and a payment of € 557 million for damages to DB Fernverkehr AG. In addition, € 1.1 billion was paid to DB Netz AG from funds under the Climate Action Program.

In addition, a withdrawal from the capital reserve of DB AG amounting to € 413 million was made to generate a net retained profit in the annual financial statements of DB AG according to commercial law which was taken into account in the net profit and loss generated.

b) Reserve resulting from valuation with no impact on profit or loss

RESERVE FOR CURRENCY TRANSLATION DIFFERENCES

The currency translation effects resulting from the method of functional currency (IAS 21) are shown separately as part of consolidated shareholders' equity.

RESERVE FOR THE FAIR VALUE ASSESSMENT OF SECURITIES AND EQUITY INVESTMENTS

The reserve includes the changes in the fair value of financial instruments with no impact on profit and loss. The reserve is to be released to or derecognized from profit or loss upon due date or disposal/maturity or reclassification of a financial instrument.

RESERVE FROM THE FAIR VALUE ASSESSMENT OF CASH FLOW HEDGES

The development of the reserve is shown in the following:

€ million	2022	2021
As of Jan 1	-87	-171
Fair value change [1]	263	412
RECLASSIFICATIONS		
Financial result	50	-295
Net interest income	-34	-26
Cost of materials [1]	0	0
Changes in deferred taxes	-4	-7
As of Dec 31	**188**	**-87**

[1] Previous year's figures adjusted.

RESERVE FOR THE REVALUATION OF PENSIONS

The effects resulting from the revaluation of defined benefit plans in accordance with IAS 19 (Employee Benefits) are recognized in other income with no impact on profit or loss.

OTHER CHANGES IN THE RESERVES

This item mainly shows amounts resulting from transactions in relation to reductions or increases in non-controlling interests between the shareholders of DB AG and the non-controlling interests.

(26) GENERATED PROFITS

The generated shareholders' equity comprises the entire net profits generated since January 1, 1994, less the goodwill offset under HGB up to December 31, 2002, as well as the dividends paid to the shareholders.

This item also shows the impact on shareholders' equity attributable to the first-time adoption of IFRS if they are not included in the reserves attributable to valuation with no impact on profit and loss.

(27) NON-CONTROLLING INTERESTS AND HYBRID CAPITAL

Non-controlling interests comprise the share of third parties in the net assets of consolidated subsidiaries. Third-party interests in the currency reserve amounted to € −19 million (as of December 31, 2021: € −13 million).

In October 2019, Deutsche Bahn Finance GmbH (DB Finance) issued two junior hybrid bonds with a total volume of € 2 billion. The hybrid bonds have undated durations with an initial termination right for the issuer after 5.5 years (coupon: 0.95%) and ten years (coupon: 1.6%) respectively; the issue proceeds amounted to € 997 million and € 995 million respectively. The two hybrid bonds do not have a repayment obligation and do not have a termination right for the creditor. In addition, any retained interest payments only have to be made when a dividend is paid. According to IAS 32 (Financial Instruments: Presentation), the hybrid bonds have to be classified entirely as equity as there is no regular repayment obligation for the hybrid bonds, nor is there any termination right for the bond holders. Interest payments to be made to the bond holders (less the taxes on income) are recognized directly in equity. Interest payments of € 25 million were made in the year under review (previous year: € 26 million).

(28) FINANCIAL DEBT

In accordance with IFRS 9, the first-time assessment of financial debts/liabilities and other non-current liabilities is generally at fair value, taking into account transaction costs or premiums/discounts. Subsequently, they are stated using amortized acquisition costs using the effective interest method. The differences between the disbursement amount less transaction costs and the repayment amount are recognized in profit or loss over the term.

Interest-free loans that are related to infrastructure capital expenditures are recognized with the present value of the amounts to be repaid, and are adjusted to their nominal repayment amount over their life. The difference between the nominal amount of the loan and the present value is recognized as an interest benefit under accruals. The income from pro rata reversal of these accruals is shown as other operating income.

Liabilities from lease contracts for which a right of use has to be recognized in accordance with IFRS 16 are shown as the present value of the following lease payments: fixed payments less payments of the lessor that are received, variable payments based on an index, expected payments for residual value guarantees, the purchase price for probably exercised purchase options, probable compensation payments in the event of early *termination. The assessment of the lease liability also includes lease payments in relation to adequately certain utilization of extension options. The leasing installments are broken down into an interest component and a redemption component. The interest component of the leasing installment is recognized in the statement of income. The interest rate used corresponds to the implied interest rate of the lease contract or, if this is not known, the maturity-related marginal borrowing rate. Liabilities arising from leases are not classified under any category of IFRS 9.*

Some transport contracts comprise the leasing particularly of rail vehicles from transport authorities or from independent financial service providers, whereby the latter receive a capital service guarantee, a redeployment guarantee or similar from the public transport authority. The present value of these payment obligations is shown under the financing liabilities from transport concessions.

The financial debt comprises all interest-bearing liabilities including the interest-free loans stated with their present values. Financial debt has the following maturity structure:

€ million	Up to 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	More than 5 years	Total more than 1 year	Total
	Residual maturity							
AS OF DEC 31, 2022								
Interest-free loans	153	145	–	–	–	–	**145**	**298**
Senior bonds	1,982	1,962	1,966	2,188	2,181	18,523	**26,820**	**28,802**
Bank borrowings	539	0	6	–	–	–	**6**	**545**
Leasing liabilities	1,120	801	641	504	391	1,723	**4,060**	**5,180**
Financing liabilities from transport concessions	20	19	19	19	18	69	**144**	**164**
Other financial liabilities	273	2	1	1	0	7	**11**	**284**
Total	**4,087**	**2,929**	**2,633**	**2,712**	**2,590**	**20,322**	**31,186**	**35,273**
thereof due to related companies and persons	153	146	–	–	–	–	**146**	**299**
AS OF DEC 31, 2021								
Interest-free loans	154	146	141	–	–	5	**292**	**446**
Senior bonds	1,575	1,958	1,948	1,983	2,288	17,651	**25,828**	**27,403**
Bank borrowings	1,315	1	0	0	–	4	**5**	**1,320**
Leasing liabilities	1,031	812	595	480	376	1,765	**4,028**	**5,059**
Financing liabilities from transport concessions	19	19	19	19	18	86	**161**	**180**
Other financial liabilities	70	5	0	0	1	2	**8**	**78**
Total	**4,164**	**2,941**	**2,703**	**2,482**	**2,683**	**19,513**	**30,322**	**34,486**
thereof due to related companies and persons	161	146	141	–	–	5	**292**	**453**

The following fair values are summarized in comparison with the carrying amounts:

AS OF DEC 31 / € million	2022 Carrying amount	2022 Fair value	2021 Carrying amount	2021 Fair value
Interest-free loans	298	299	446	476
Senior bonds	28,802	24,512	27,403	28,269
Bank borrowings	545	546	1,320	1,321
Leasing liabilities	5,180	4,787	5,059	5,247
Financing liabilities from transport concessions	164	151	180	196
Other financial liabilities	284	284	78	78
Total	**35,273**	**30,579**	**34,486**	**35,587**

The differences between the carrying amounts and the fair values of the financial debt are due to the mostly changed market interest rates for financial debt with a comparable risk profile. In view of the short maturities involved and also in view of the fact that interest charged is closely linked to market rates, there are no significant differences between the carrying amounts and the fair values of other financial liabilities.

Interest-free loans were also attributable almost exclusively to financing provided by the Federal Government for capital expenditures in expanding and replacing track infrastructure. This is based on the responsibility for the transport needs of the public which is anchored in section 87e (4) of the German Basic Law (Grundgesetz; GG) and specified in the Federal Rail Infrastructure Extension Act (Bundesschienenwegeausbaugesetz; BSWAG).

The repayment of the loans is regulated in individual and collective financing agreements. In general, the loans are repaid in equal annual installments, which are based on the corresponding annual depreciation applicable for the financed assets.

Interest-free loans have developed as follows:

€ million	2022	2021
AS OF JAN 1	446	580
Addition	–	0
Redemption	– 157	– 157
Reclassifications	– 7	–
Compounding	16	23
As of Dec 31	**298**	**446**

As of the balance sheet date, the senior bonds are issued as follows:

SENIOR BONDS AS OF DEC 31 / € million	Issue volume	Issue currency	Maturity (years)	Effective interest rate (%)	2022 Carrying amount	2022 Fair value	2021 Carrying amount	2021 Fair value
UNLISTED SENIOR BONDS								
DB Finance	1,185	AUD, JPY, EUR	1.4 - 9.8		1,180	1,088	1,192	1,262
Total					**1,180**	**1,088**	**1,192**	**1,262**
LISTED SENIOR BONDS OF DB FINANCE								
Bond 2010 - 2025	500	EUR	2.5	3.870	499	507	498	567
Bond 2010 - 2022	500	EUR	0.0	3.464	-	-	500	515
Bond 2012 - 2022	496	GBP	0.0	2.821	-	-	476	481
Bond 2012 - 2023	400	EUR	0.1	2.116	400	400	399	411
Bond 2012 - 2024	83	CHF	1.1	1.586	101	101	97	101
Bond 2012 - 2024	500	EUR	1.2	3.119	499	501	498	536
Bond 2012 - 2072	75	GBP	49.9	4.524	67	65	71	129
Bond 2013 - 2028	50	EUR	5.1	2.707	50	48	50	57
Bond 2013 - 2025	202	NOK	2.2	4.017	143	142	150	158
Bond 2013 - 2023	386	CHF	0.6	1.425	482	482	460	473
Bond 2013 - 2026	497	GBP	3.6	3.351	476	457	501	547
Bond 2013 - 2023	500	EUR	0.7	2.578	500	500	499	523
Bond 2014 - 2024	59	AUD	1.1	5.395	57	57	58	61
Bond 2014 - 2024	246	CHF	1.7	1.522	305	304	290	304
Bond 2014 - 2029	500	EUR	6.2	2.886	496	480	495	591
Bond 2014 - 2022	300	EUR	0.0	FRN	-	-	300	301
Bond 2014 - 2022	300	EUR	0.0	FRN	-	-	300	300
Bond 2015 - 2023	600	EUR	0.8	FRN	600	600	600	604
Bond 2015 - 2025	600	EUR	2.8	1.391	598	572	596	628
Bond 2015 - 2030	366	NOK	7.8	2.760	323	295	340	347
Bond 2015 - 2025	115	AUD	2.8	3.864	114	112	115	122
Bond 2015 - 2030	650	EUR	7.8	1.707	646	559	646	719
Bond 2015 - 2025	161	CHF	2.9	0.143	178	171	169	171
Bond 2016 - 2026	500	EUR	3.2	0.880	498	465	497	514
Bond 2016 - 2031	750	EUR	8.5	0.964	745	596	744	775
Bond 2016 - 2028	500	EUR	5.7	0.765	496	429	495	516
Bond 2016 - 2024	41	HKD	1.2	2.100	42	41	40	40
Bond 2017 - 2032	79	NOK	9.1	2.514	66	59	70	69
Bond 2017 - 2032	500	EUR	9.9	1.541	498	408	498	548
Bond 2017 - 2025	341	GBP	2.5	1.437	338	315	356	359
Bond 2017 - 2032	55	SEK	9.6	2.226	48	40	52	54
Bond 2017 - 2030	261	CHF	7.9	0.463	305	268	290	298
Bond 2017 - 2024	300	EUR	1.9	FRN	301	300	301	303
Bond 2018 - 2027	1,000	EUR	5.0	1.086	996	893	995	1,049
Bond 2018 - 2033	750	EUR	10.6	1.680	746	606	746	831
Bond 2018 - 2028	346	CHF	5.5	0.470	407	375	388	399
Bond 2018 - 2031	500	EUR	8.2	1.508	495	416	494	538
Bond 2018 - 2043	125	EUR	20.9	1.866	125	87	125	138
Bond 2019 - 2028	1,000	EUR	6.0	1.235	994	879	993	1,062
Bond 2019 - 2026	340	GBP	3.1	1.944	338	313	356	366
Bond 2019 - 2034	103	NOK	11.1	2.732	95	83	100	100
Bond 2019 - 2029	310	CHF	6.5	0.135	355	314	338	338
Bond 2019 - 2034	133	CHF	11.5	0.516	152	125	145	148
Bond 2019 - 2039	47	SEK	16.4	2.025	45	34	49	49
Bond 2020 - 2035	500	EUR	12.5	0.819	496	348	496	495
Bond 2020 - 2024	300	EUR	1.1	- 0.062	300	290	300	301
Bond 2020 - 2032	150	EUR	9.2	0.257	150	108	150	143
Bond 2020 - 2027	900	EUR	4.3	0.639	895	800	894	917
Bond 2020 - 2040	750	EUR	17.3	1.433	743	523	743	789
Bond 2020 - 2029	850	EUR	6.5	0.411	848	698	848	857
Bond 2020 - 2039	650	EUR	16.5	0.977	640	421	639	631
Bond 2020 - 2035	48	SEK	12.5	1.544	45	34	49	47
Bond 2020 - 2050	1,000	EUR	27.9	0.656	992	483	991	861
Bond 2021 - 2036	370	CHF	13.1	0.100	407	305	388	372
Bond 2021 - 2026	339	GBP	3.9	0.523	336	288	354	341
Bond 2021 - 2026	494	SEK	3.1	0.524	449	401	487	479
Bond 2021 - 2036	1,000	EUR	13.3	0.759	983	669	982	959
Bond 2021 - 2033	296	CHF	10.4	0.211	330	267	315	311
Bond 2021 - 2041	168	AUD	18.4	3.124	165	116	166	168
Bond 2021 - 2051	1,000	EUR	28.4	1.159	992	548	991	980
Bond 2021 - 2036	196	NOK	13.5	2.241	190	154	200	187
Bond 2021 - 2031	750	EUR	8.7	0.393	747	566	747	739
Bond 2021 - 2031	279	CHF	8.8	0.241	305	257	291	290
Bond 2022 - 2042	191	AUD	19.0	3.350	190	137	-	-
Bond 2022 - 2027	200	EUR	4.1	0.791	199	181	-	-
Bond 2022 - 2034	750	EUR	11.2	1.389	747	580	-	-
Bond 2022 - 2030	900	EUR	7.4	1.992	891	804	-	-
Bond 2022 - 2040	52	SEK	17.7	3.511	49	47	-	-
Bond 2022 - 2032	308	CHF	9.7	1.903	305	297	-	-
Bond 2022 - 2034	51	NOK	11.7	4.370	47	49	-	-
Bond 2022 - 2042	500	EUR	19.8	3.924	495	502	-	-
Bond 2022 - 2042	151	CHF	19.9	2.285	151	152	-	-
Total					**27,706**	**23,424**	**26,211**	**27,007**
Adjustments from derivatives					- 84	-	-	-
Senior bonds, total amount					**28,802**	**24,512**	**27,403**	**28,269**

In the year under review, two fixed-interest listed senior bonds from DB Finance amounting to € 500 million and GBP 400 million (€ 495 million), as well as two floating-rate listed senior bonds (each amounting to € 300 million) with a total value of € 1,595 million were redeemed on schedule.

In the year under review, DB Finance issued nine fixed-interest, listed senior bonds with a total value of € 3,102 million. These involve issues of AUD 300 million (€ 191 million), € 200 million, € 750 million, € 900 million, SEK 550 million (€ 52 million), CHF 300 million (€ 308 million), NOK 500 million (€ 50 million), € 500 million and CHF 150 million (€ 151 million). Part of the newly issued EUR bonds were swapped from fixed interest to floating interest. As a result, the valuation of the bond portfolio resulted in a reduction in carrying amount by € 84 million (as of December 31, 2021: none).

Bank borrowings are detailed in the following table:

BANK BORROWINGS AS OF DEC 31 / € million	Currency	Maturity in years	Nominal interest rate (%)	**2022** Carrying amount	**2022** Fair value	2021 Carrying amount	2021 Fair value
Bank loan 2002–2022	EUR	0.0	FRN	–	–	200	200
Bank loan 2003–2022	EUR	0.0	FRN	–	–	200	200
Bank loan 2021–2022	EUR	0.0	FRN	–	–	500	500
Other				545	546	420	421
Total				**545**	**546**	**1,320**	**1,321**

The decline in bank borrowing as of December 31, 2022, resulted mainly from the full scheduled repayment of two long-term loans and a short-term credit facility.

The increase in other bank borrowings was mainly attributable to an increase in short-term collateral (as of December 31, 2022: € 525 million; as of December 31, 2021: € 272 million) resulting from collateral agreements within the framework of derivative transactions.

Liabilities are not secured in DB Group as a ground rule.

As of December 31, 2022, further guaranteed credit facilities with a total volume of € 4,589 million were available to DB Group (as of December 31, 2021: € 4,577 million). Of this figure, € 2,000 million was attributable to back-up lines for the € 3.0 billion commercial paper program of DB AG (as of December 31, 2021: € 2,080 million). None of these back-up lines had been drawn down as of December 31, 2022. Global credit facilities totaling € 2,589 million (as of December 31, 2021: € 2,497 million) are used for working capital and surety for payment financing of subsidiaries with operations worldwide, primarily in the DB Schenker and DB Arriva segments.

Liabilities attributable to leasing (Note (13) 231ff.) are secured by rights of the lessors in relation to the leased assets. As of December 31, 2022, the leased assets have a carrying amount of € 4,692 million (as of December 31, 2021: € 4,619 million).

The nominal values of the leasing liabilities are broken down as follows:

LEASING LIABILITIES / € million	Residual maturity Up to 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	More than 5 years	Total more than 1 year	Total
AS OF DEC 31, 2022								
Nominal values of lease payments	1,136	902	720	566	442	2,063	**4,693**	**5,829**
AS OF DEC 31, 2021								
Nominal values of lease payments	1,058	884	653	528	416	2,085	**4,566**	**5,624**

The financing liabilities from transport concessions in accordance with IFRIC 12 are detailed in the following:

AS OF DEC 31 / € million	Currency	Maturity in years	**2022** Carrying amount	**2022** Fair value	2021 Carrying amount	2021 Fair value
Diesel network Allgäu diesel multiple units (2020)	EUR	7.0	35	34	40	43
S-Bahn (metro) Nuremberg electric multiple units (2020)	EUR	8.0	60	57	66	73
S-Bahn (metro) Rhine-Neckar electric multiple units (2020)	EUR	12.0	8	7	9	10
S-Bahn (metro) Rhine-Neckar electric multiple units (2021)	EUR	12.0	61	53	65	70
Total			**164**	**151**	**180**	**196**

Various multiple units were leased by the responsible contracting organizations for the fulfilment of regional rail passenger transport services.

In the previous year, the second operational stage for the Rhine-Neckar S-Bahn (metro) was added with a term until 2034. Financial liabilities from transport concessions are opposed by receivables from transport concessions (Note (19) 236ff.).

The fair values of the long-term financial debt are allocated to the following valuation categories:

AS OF DEC 31 / € million	2022 Level 1	2022 Level 2	2022 Level 3	2022 Total	2021 Level 1	2021 Level 2	2021 Level 3	2021 Total
NON-CURRENT FINANCIAL DEBT								
Interest-free loans	–	146	–	**146**	–	322	–	**322**
Senior bonds	2,335	20,194	–	**22,529**	5,332	21,342	–	**26,674**
Bank borrowings	–	7	–	**7**	–	6	–	**6**
Leasing liabilities	–	3,667	–	**3,667**	–	4,216	–	**4,216**
Financing liabilities from transport concessions	–	131	–	**131**	–	177	–	**177**
Other financial liabilities	–	11	–	**11**	–	8	–	**8**
Total	**2,335**	**24,156**	**–**	**26,491**	**5,332**	**26,071**	**–**	**31,403**

The interest-free loans shown at amortized acquisition cost are calculated by discounting the nominal values of the interest-free loans, which are broken down into maturity buckets using the DB interest curve (market interest curve plus current DB spread; source: Thomson Reuters or Bloomberg).

Market prices from an active market, multiplied by the foreign currency rates applicable on the balance sheet date, are used for senior bonds of DB Finance that are classified as level 1. Various sources are used for these prices, including Thomson Reuters and Bloomberg. The senior bonds for which the market activity does not meet the requirements of an active market have been allocated to level 2. For establishing the fair values of these senior bonds, binding offers were used from various sources, including Thomson Reuters and Bloomberg; these have been verified on the basis of the valuation models using the parameters that are observable on the market, such as interest rate curves and exchange rates.

The fair value of the leases and also of the financing liabilities from transport concessions is determined by discounting the outstanding lease payments with the corresponding DB interest rate curves (market interest curve plus current spread; source: Thomson Reuters or Bloomberg).

(29) LIABILITIES

In accordance with IFRS 9, the first-time assessment of liabilities is generally at fair value, taking into account transaction costs and premiums/discounts. Subsequently, non-current liabilities are stated using amortized acquisition cost using the effective interest method. The differences between the disbursement amount less transaction costs and the repayment amount are recognized in profit or loss over the term.

The fair values of the balance sheet items miscellaneous liabilities, trade liabilities and other liabilities essentially correspond to the carrying amounts.

Severance package commitments for agreements made as of the balance sheet date are recognized as other liabilities and – if they are not yet included in individual agreements and if they are part of a restructuring commitment in accordance with IAS 37 – are stated as other provisions.

Movements in the liabilities are shown in the following:

€ million	Residual maturity: Up to 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	More than 5 years	Total more than 1 year	Total
AS OF DEC 31, 2022								
Trade liabilities including advance payments received	7,940	76	21	6	6	8	**117**	**8,057**
Miscellaneous and other liabilities	4,463	170	160	167	17	302	**816**	**5,279**
Total	**12,403**	**246**	**181**	**173**	**23**	**310**	**933**	**13,336**
thereof non-financial liabilities	2,660	8	3	2	2	4	**19**	**2,679**
thereof advance payments received	297	2	2	2	1	4	**11**	**308**
thereof due to related parties	185	–	–	–	–	–	**–**	**185**
AS OF DEC 31, 2021								
Trade liabilities including advance payments received	8,097	98	7	6	4	11	**126**	**8,223**
Miscellaneous and other liabilities	3,883	15	8	6	16	170	**215**	**4,098**
Total	**11,980**	**113**	**15**	**12**	**20**	**181**	**341**	**12,321**
thereof non-financial liabilities	2,613	11	3	2	2	6	**24**	**2,637**
thereof advance payments received	280	2	2	1	1	6	**12**	**292**
thereof due to related parties	152	0	–	–	–	–	**0**	**152**

The decline in trade liabilities was attributable to the DB Regional segment at € 228 million, with an increase in the Subsidiaries/Other segment (€ +134 million). Miscellaneous and other liabilities increased in the DB Regional segment (€ +617 million) and in the DB Long-Distance segment (€ +467 million). Please also refer to Segment information according to segments 214f.

Non-financial liabilities and advance payments received are not classified under any category of IFRS 9.

The miscellaneous and other liabilities were broken down as follows:

AS OF DEC 31 / € million	2022	2021
PERSONNEL-RELATED LIABILITIES		
Unused holiday entitlements	318	314
Outstanding overtime liability	304	284
Social security	129	137
Severance payments	36	25
Christmas bonuses	11	14
Vacation pay	25	28
Other personnel obligations	1,163	1,129
OTHER TAXES		
Value-added tax	81	91
Payroll and church taxes, solidarity surcharge	198	207
Miscellaneous other taxes	108	117
Interest payable	183	160
Revenue discounts	59	60
Deferred investment grants	286	243
Independent acknowledgement of debt issued for delivery transactions	771	–
Liabilities in accordance with the Railroad Crossings Act	4	0
Miscellaneous liabilities	1,603	1,289
Total	**5,279**	**4,098**

The increase in personnel-related liabilities resulted in particular from an increase in other personnel obligations in connection with the payment of pension obligations in Sweden and due to the increase in performance-related bonuses in the DB Schenker segment.

Liabilities as of December 31, 2022, were unchanged at € 0 million.

The miscellaneous other liabilities included existing risks for factoring agreements.

Commitments from issued independent acknowledgement of debt have been recognized in the balance sheet since the year under review. This resulted in an increase in miscellaneous and other liabilities of € 771 million. The commitments correspond to equal amounts of receivables from supply contracts that are hedged by bank guarantees in the event of a claim.

(30) INCOME TAX LIABILITIES

Income tax liabilities as of December 31, 2022, related in particular to commitments to the tax authorities in the United Kingdom, India and Germany.

(31) PENSION OBLIGATIONS

GRI

DB Group grants post-employment benefits to its employees in numerous countries. The form of the pension commitments depends on the legal, economic and tax conditions applicable in the particular country.

In DB Group, there are defined benefit as well as defined contribution retirement pension systems. The defined benefit commitments are assessed and accounted for in accordance with IAS 19. Major pension obligations exist only in Germany and in the United Kingdom. For this reason, only these pension obligations are described in greater detail in the following.

Germany

DB Group's pension obligations in Germany apply to both civil servants and employees.

After they retire, civil servants assigned to DB Group companies receive retirement benefits from the Federal Railway Fund under the Civil Servants Benefits Act (Beamtenversorgungsgesetz).

Only while the assigned civil servants are actively working for DB Group are payments made to the Federal Railway Fund as part of a pro forma settlement in the same way as for newly recruited employees (section 21 (1) DBGrG). This also includes theoretical amounts for contributions to statutory pension insurance schemes as well as theoretical costs in accordance with the collective bargaining agreements regarding the additional company pension scheme for employees of DB AG (Tarifvertrag über die betriebliche Zusatzversorgung; ZVersTV) and company pension plan (Tarifvertrag über die betriebliche Altersvorsorge; bAV-TV) of the employees of DB AG. The payments made to the Federal Railway Fund for retirement pensions of civil servants are defined contribution retirement schemes.

The pension obligations with regard to employees mainly relate to the following:

a) Employees who were employed by Deutsche Bundesbahn before DB AG was established (January 1, 1994) enjoy supplementary benefits in view of their former membership of the public sector. The employees are entitled to benefits from this additional pension insurance from Deutsche Rentenversicherung Knappschaft-Bahn-See (KBS). As an official authority, KBS has not only assumed responsibility for managing and paying the statutory pension for DB Group employees; it also continues the additional pension insurance for the transferred employees who are beneficiaries.

During the active phase of the employment agreement, a pro forma refund of expenses is also provided to the Federal Railway Fund for these employees. When the employee retires, this payment is no longer made to the Federal Railway Fund.

The Federal Railway Fund bears the costs of these additional benefits, less the contribution made by the employees themselves (section 14 (2) DBGrG). Accordingly, DB AG does not set aside any provisions for these public sector benefits.

b) Employees of the former Deutsche Reichsbahn and the employees who have been recruited after January 1, 1994, and before December 31, 2021, receive an additional company pension from DB AG within the framework of the ZVersTV. This supplementary company pension is a defined benefit scheme, which is linked to salary and length of service. The current pension benefits are adjusted every year in line with the regulations of the Company Pensions Act (Betriebsrentengesetz). Retirement benefits, invalidity benefits and benefits to surviving dependents are provided in the form of a lifetime pension. No plan assets are created for this scheme.

In addition, the employees in most Group companies receive a monthly contribution to the company retirement benefit scheme in the amount of 3.3% of the employee's monthly standard salary as well as of most of the salary elements paid in the month. The monthly contribution is paid into a pension plan (DEVK-Pensionsfonds). It is not necessary for provisions to be created for this purpose.

c) Various defined benefit pension obligations exist with regard to senior executives in DB Group who were granted a senior executive commitment before January 1, 2007. The extent of the benefits depends on the length of service and the salary of the beneficiary. In general, retirement benefits, invalidity benefits and benefits to surviving dependents are provided in the form of a lifetime pension. With the exception of a small number of reinsurance policies, there are no plan assets.

d) Senior executives of DB Group who were granted a senior executive commitment after December 31, 2006, are provided with a retirement benefit scheme in the form of a defined contribution commitment. For this purpose, a benefit module is calculated in each year of service, depending on the salary and age of the beneficiaries. These benefits are financed by way of a contractual trust arrangement (CTA), namely Deutsche Bahn Pension Trust e. V. The extent of the benefits depends on the yield of the CTA, whereby a minimum return is guaranteed (guarantees up to and including 2014: 2.25% p.a.; guarantees from 2015 onwards: only maintenance of contribution). To avoid longevity risks, the benefits are granted in the form of a five-year installment. The assets of the CTA are classified as plan assets. The pension obligation is covered by the plan assets on the assumption that the CTA produces a corresponding performance, thus minimizing investment risks. There are no legal or regulatory obligations requiring Deutsche Bahn Pension Trust e. V. to make minimum payments into the scheme. The contributions are invested in line with the fundamental assumption that the benefit commitment is guaranteed by a corresponding guarantee element. For each payment relating to an individual beneficiary, an age-related amount is invested in prime zero bonds. The investment amount remaining after the payment has been made into the guarantee element is mainly invested in passively managed European equity and bond funds (or equivalent products) with the aim of optimizing returns.

e) Senior executives are able to participate in a deferred compensation program. This employee-financed form of company pension plan constitutes a defined benefit obligation.

United Kingdom

a) The company pension plan of DB Cargo (UK) Holdings Limited is essentially a defined benefit pension plan (linked to salary and length of service) within the British Railway Pension Scheme. The plan assets are managed by an independent trustee. The process of collating the data of members in the plan for the purpose of compliance with legal requirements in relation to the members of the plan is generally carried out every three years. As of the intermediate valuation dates, the obligations in the plan are measured on the basis of the correspondingly updated data. The pension plan is based on final salary, and lifetime pensions are provided as benefits. The pension obligations are essentially covered by plan assets. Capital is invested by the trustee of the plan assets following liaison with DB Group.

b) At DB Arriva, there are mainly defined benefit retirement benefit commitments. Important defined benefit plans (related to salary and length of service) relate to employees of DB Arriva within the Railway Pension Scheme in the United Kingdom. These are sections other than the DB Cargo UK plan within the Railway Pension Scheme. The costs of the pension plans are reduced in a ratio of 60:40 (employer:employee) and accordingly recognized in the balance sheet. The pension plan is based on final salary, and lifetime pensions are provided as benefits. The corresponding pension obligations are essentially covered by plan assets. Capital is invested by the trustee of the plan assets following liaison with DB Group.

Some companies pay contributions within the framework of a franchise agreement to the British Railway Pension Scheme for employees employed for the duration of the agreement (franchise period). The obligations to these employees as well as the plan assets are completely disclosed after deduction of the element financed by the employees (40%). Within the framework of recognizing the effect of franchise agreements, the present value of the contributions payable for the duration of the franchise agreements for reducing a scheme deficit remains as a net liability recognized in the balance sheet. The current contributions to the benefit scheme are shown as personnel expenses.

In addition, individual companies of DB Arriva also issued defined contribution retirement benefit commitments to their employees. Under such arrangements, the employer does not enter into any obligations apart from paying contributions to an external benefit scheme. The extent of the future pension benefits depends exclusively on the amount of contributions paid to the external benefit scheme, including the income generated by investing these contributions.

In addition, some contributions have also been paid to social pension funds within the context of statutory regulations (government schemes).

Critical estimations and assessments

In the case of the defined benefit pension obligations in Germany and abroad, the actuarial risks are borne by DB Group. Actuarial methods have been used for measuring defined benefit pension commitments as well as benefit commitments which are similar to pensions and the resultant expenses and income. The valuations are based on actuarial assumptions. There are the following actuarial risks which are considered to be typical for companies with defined benefit schemes:

- ***Interest risk:** The discount factors which are used reflect the interest rates (giving due consideration to the duration of the underlying obligation) which are achieved on the balance sheet date for high-quality fixed-interest senior bonds with a corresponding duration. A change in the discount rate results in a change in the present value of the total obligation (DBO).*
- ***Inflation risk:** Part of the pension obligations, particularly as a result of adjustments to current pensions, is linked to the development of inflation.*
- ***Longevity risk:** A longevity risk may occur in the form of extended periods in which pensions are paid out as a result of an increase in life expectancy in future.*
- ***Investment risk:** In the case of externally financed pension plans, the values of the corresponding plan assets or the refund claims are based on the fair values as of the balance sheet date. The capital investment is exposed to numerous risks, which may have an impact on the present value recognized for the plan assets. In the case of pension schemes with an obligation to pay into the scheme, the amount of future contributions may be affected by the investment risk.*

Key assumptions for expenses and income attributable to pension commitments and benefit commitments similar to pensions are to some extent based on current market conditions. Expenses and income relating to pension commitments and benefit commitments similar to pensions may change as a result of changes to these underlying key assumptions.

The figures stated for pension provisions in the balance sheet are detailed in the following table:

	Germany		Europe (excluding Germany)		Rest of world		Total	
AS OF DEC 31 / € million	2022	2021	2022	2021	2022	2021	2022	2021
Commitments for funded benefits	339	424	3,943	6,586	40	62	**4,322**	**7,072**
Commitments for unfunded benefits	2,782	4,371	58	73	11	14	**2,851**	**4,458**
Total obligations	**3,121**	**4,795**	**4,001**	**6,659**	**51**	**76**	**7,173**	**11,530**
Fair value of the plan assets	- 271	- 328	- 3,949	- 5,207	- 33	- 40	**- 4,253**	**- 5,575**
Effects due to cost sharing	–	–	- 34	- 420	–	–	**- 34**	**- 420**
Effects due to franchise agreements	–	–	- 34	- 604	–	–	**- 34**	**- 604**
Amount not recognized as an asset as a result of the IAS 19.58 restriction	–	–	0	0	–	–	**0**	**0**
Asset recorded on the balance sheet as receivables from plan assets	–	–	118	100	–	–	**118**	**100**
Net obligations recognized in the balance sheet	**2,850**	**4,467**	**102**	**528**	**18**	**36**	**2,970**	**5,031**

The total pension commitment has developed as follows:

	Germany		Europe (excluding Germany)		Rest of world		Total	
€ million	2022	2021	2022	2021	2022	2021	2022	2021
Commitments as of Jan 1	4,795	5,530	6,659	6,909	76	79	**11,530**	**12,518**
Service cost, excluding employee contributions	189	228	48	72	3	4	**240**	**304**
Employee contributions	3	3	25	31	0	0	**28**	**34**
Interest expense	52	16	92	67	1	0	**145**	**83**
Payments	- 98	- 85	- 192	- 458	- 7	- 3	**- 297**	**- 546**
thereof pension payments	- 94	- 85	- 184	- 170	- 7	- 3	**- 285**	**- 258**
thereof payments for settlements	- 4	0	- 8	- 288	–	0	**- 12**	**- 288**
Past service costs and profit or losses from settlements	4	3	- 2	- 60	0	- 1	**2**	**- 58**
Transfers	1	2	0	0	–	–	**1**	**2**
Changes in the scope of consolidation	- 8	3	- 18	–	–	–	**- 26**	**3**
thereof additions in scope of consolidation	–	3	–	–	–	–	**–**	**3**
thereof disposals in scope of consolidation	- 8	–	- 18	–	–	–	**- 26**	**–**
Actuarial gains (-) / losses (+)	- 1,817	- 905	- 2,370	- 338	- 22	- 8	**- 4,209**	**- 1,251**
from revaluations based on experience	- 125	- 31	485	128	0	1	**360**	**98**
from changes in demographic assumptions	- 2	- 3	- 38	- 22	- 1	0	**- 41**	**- 25**
from changes in financial assumptions	- 1,690	- 871	- 2,817	- 444	- 21	- 9	**- 4,528**	**- 1,324**
Exchange rate effects	–	–	- 241	436	0	5	**- 241**	**441**
Scope of commitments as of Dec 31	**3,121**	**4,795**	**4,001**	**6,659**	**51**	**76**	**7,173**	**11,530**

The amounts reported in the previous year under payments for settlements in the above and in the following tables mainly relate to the payment of pension obligations at Arriva plc, Sunderland / United Kingdom.

The development of the plan assets is detailed in the following overview:

	Germany		Europe (excluding Germany)		Rest of world		Total	
€ million	2022	2021	2022	2021	2022	2021	2022	2021
Fair value of plan assets as of Jan 1	328	314	5,207	4,503	40	37	**5,575**	**4,854**
Employer contributions	30	31	79	85	2	1	**111**	**117**
Employee contributions	1	1	25	31	0	0	**26**	**32**
Notional return from plan assets	4	1	86	56	0	0	**90**	**57**
Payments	- 5	- 5	- 185	- 241	- 7	- 2	**- 197**	**- 248**
thereof pension payments	- 5	- 5	- 177	- 158	- 7	- 2	**- 189**	**- 165**
thereof payments for settlements	–	–	- 8	-83	–	–	**- 8**	**-83**
Transfers	–	–	–	–	–	–	**–**	**–**
Changes in the scope of consolidation	0	1	- 13	–	–	–	**- 13**	**1**
Revaluation	- 87	- 15	- 1,016	463	- 2	2	**- 1,105**	**450**
Administrative costs: costs of pension assurance	–	–	- 10	- 10	0	- 1	**- 10**	**- 11**
Exchange rate effects	–	–	- 224	320	0	3	**- 224**	**323**
Fair value of plan assets as of Dec 31	**271**	**328**	**3,949**	**5,207**	**33**	**40**	**4,253**	**5,575**

The reported plan assets are broken down as follows:

AS OF DEC 31 / € million	Germany		Europe (excluding Germany)		Rest of world		Total	
	2022	2021	2022	2021	2022	2021	2022	2021
Stocks and other securities	12	12	1,866	2,288	10	12	**1,888**	**2,312**
thereof with market price listing	12	12	1,866	2,288	10	12	**1,888**	**2,312**
Interest-bearing securities	158	213	1,426	2,115	21	24	**1,605**	**2,352**
thereof with market price listing	158	213	1,426	2,115	21	24	**1,605**	**2,352**
Reinsurance	68	69	96	121	–	–	**164**	**190**
thereof with market price listing	68	69	82	103	–	–	**150**	**172**
thereof without market price listing	–	–	14	18	–	–	**14**	**18**
Private equity	–	–	158	220	–	–	**158**	**220**
thereof without market price listing	–	–	158	220	–	–	**158**	**220**
Investments in infrastructure	–	–	167	210	–	–	**167**	**210**
thereof with market price listing	–	–	167	210	–	–	**167**	**210**
Cash and other assets	33	34	236	253	2	4	**271**	**291**
thereof with market price listing	33	34	69	77	0	2	**102**	**113**
thereof without market price listing	–	–	167	176	2	2	**169**	**178**
	271	**328**	**3,949**	**5,207**	**33**	**40**	**4,253**	**5,575**
thereof assets recorded as receivables from plan assets	–	–	- 118	- 100	–	–	**- 118**	**- 100**
	271	**328**	**3,831**	**5,107**	**33**	**40**	**4,135**	**5,475**

Changes in the net pension provisions are detailed in the following:

€ million	Germany		Europe (excluding Germany)		Rest of world		Total	
	2022	2021	2022	2021	2022	2021	2022	2021
Provision as of Jan 1	4,467	5,216	528	1,259	36	42	**5,031**	**6,517**
Pension expenses	243	248	62	33	4	4	**309**	**285**
thereof service cost	189	228	48	72	3	4	**240**	**304**
thereof employee contributions	2	2	–	–	–	–	**2**	**2**
thereof interest income and interest expenses	48	15	6	11	1	0	**55**	**26**
thereof administrative expenses	–	–	10	10	0	1	**10**	**11**
thereof past service costs and profits or losses from settlements	4	3	- 2	- 60	0	- 1	**2**	**- 58**
Employer contributions	- 30	- 31	- 79	- 85	- 2	- 1	**- 111**	**- 117**
Payments	- 93	- 80	- 7	- 217	0	- 1	**- 100**	**- 298**
thereof pension payments	- 89	- 80	- 7	- 12	0	- 1	**- 96**	**- 93**
thereof payments for settlements	- 4	0	0	- 205	–	0	**- 4**	**- 205**
Transfers	1	2	0	0	–	–	**1**	**2**
Changes in the scope of consolidation	- 8	2	- 5	–	–	–	**- 13**	**2**
thereof additions in scope of consolidation	–	2	–	–	–	–	**–**	**2**
thereof disposals in scope of consolidation	- 8	–	- 5	–	–	–	**- 13**	**–**
Revaluation	- 1,730	- 890	- 414	- 582	- 20	- 10	**- 2,164**	**- 1,482**
from revaluations based on experience	- 125	- 31	405	83	0	1	**280**	**53**
from changes in demographic assumptions	- 2	- 3	- 36	- 20	- 1	0	**- 39**	**- 23**
from changes in financial assumptions	- 1,690	- 871	- 1,756	- 270	- 21	- 9	**- 3,467**	**- 1,150**
Difference between actual income and theoretical income from plan assets	87	15	973	- 375	2	- 2	**1,062**	**- 362**
Exchange rate effects	–	–	- 6	42	0	2	**- 6**	**44**
Change in recognized assets	–	–	23	78	–	–	**23**	**78**
Provisions as of Dec 31	**2,850**	**4,467**	**102**	**528**	**18**	**36**	**2,970**	**5,031**

All other items were recognized under personnel expenses.

The actuarial parameters used for assessing the value of most of the pension provision are set out in the following:

%	2022	2021
INTEREST RATE		
Germany and abroad (excluding United Kingdom)	3.80	1.10
United Kingdom	4.75	1.90
EXPECTED RATE OF SALARY INCREASES		
Germany and abroad (excluding United Kingdom)	4.10	3.10
United Kingdom	3.30	3.50
EXPECTED RATE OF PENSION INCREASE (DEPENDING ON GROUP OF PERSONNEL)		
Germany and abroad (excluding United Kingdom)	2.00	1.75
United Kingdom	2.30	2.50

The 2018 G mortality tables of Professor Dr. Klaus Heubeck have been used without changes for valuing the pension obligations for the German Group companies. Country-specific or benefit-scheme-specific mortality tables have been used for valuing the pension obligations of the other Group companies.

Sensitivities and additional information:

AS OF DEC 31 / € million	2022	2021
Total obligation for an interest rate increased by 1 percentage point	6,225	9,528
Total obligation for an interest rate reduced by 1 percentage point	8,364	14,186
Total obligation with salary growth increased by 0.5%	7,239	11,673
Total obligation for pensions increased by 0.5%	7,473	12,288
Total obligation for life expectancy increased by 1 year	7,411	11,876
Total obligations	7,173	11,530
thereof active beneficiaries	3,027	5,308
thereof former employees	1,245	2,252
thereof pensioners	2,901	3,970
Expected payments into plan assets for next year	110	107
Direct pension payments for next year	116	116
Duration of benefit obligation (years)	15.5	20.2

The sensitivity figures have been established using the method which was used for calculating the extent of the commitment. One assumption was modified while the other assumptions were retained, which means that interdependencies between the individual assumptions were disregarded.

(32) OTHER PROVISIONS

Other provisions are recognized if a legal or constructive commitment exists as a result of a past event, the probability of its utilization is greater than 50% and it will lead to an outflow of resources, and if a reliable estimate of the extent of the commitment can be made (IAS 37 Provisions, Contingent Liabilities and Contingent Assets).

Non-current provisions are discounted using market interest rates. Environmental protection provisions for the rehabilitation of existing ecological legacy issues are discounted on the basis of real interest rates, which are adjusted to reflect the risk and the period until fulfillment. The difference between the nominal value of the expected outflows and the present value recognized for the environmental protection provisions of DB AG for transferred liabilities for the elimination of legacy issues from the time previous to the foundation of DB AG is stated under deferred items, and represents the interest benefit resulting from the longer-term release of the provision. The compounding expense attributable to other provisions is recognized in net interest income. Provisions for impending losses are measured as the lower of the amount of the expected costs for fulfilling the agreement and the expected costs for terminating the agreement.

Critical estimations and assessments

The process of determining all types of provisions is associated with estimates regarding the extent and/or timing of obligations.

The environmental protection provisions relate primarily to the obligation of DB AG to remedy the ecological burdens which arose before January 1, 1994, on the land of the former Deutsche Bundesbahn and the former Deutsche Reichsbahn. Ecological burdens are defined as contamination of soil and groundwater that requires rehabilitation and that pose risks, considerable disadvantages or considerable problems for private individuals or society at large. The legal basis for deriving remediation obligations are summarized in the soil and water laws of the Federal Government and the Federal states. The process of dealing with ecological burdens also comprises necessary remediation measures for existing sewers, in order to avoid soil and groundwater contamination caused by leaks from the sewer system, as well as measures for shutting down old landfill sites.

The provision has been calculated on the basis of a discounting method using the present value, where remediation measures are probable, the remediation costs can be reliably estimated and no future benefit is expected to be derived from these measures.

The estimation of future remediation costs is subject to various factors. Major drivers in this respect can be the application of innovative rehabilitation measures, changes in legal conditions and also the development in market prices for disposing of legacy issues. In order to make a realistic assessment of the remediation costs in individual cases, the working programs have included adjustments to cost estimates as a result of greater knowledge and official agreements in the successive processing stages.

For the valuation of provisions as of the balance sheet date, the investigation and rehabilitation obligations which are currently known have been used as the basis for estimating the expected costs in relation to the current price level. The provision is discounted on the basis of expected cash outflows, using a risk-adjusted interest rate of 0.09% (as of Dec 31, 2021: 0.00%).

Provisions for impending losses from pending transactions are created if a loss is probable and can be reliably estimated. In view of the uncertainty associated with this assessment, the actual losses may differ from the original estimates and may thus also differ from the amount of the provision. In DB Group, such uncertainty results particularly from the estimates of future income from transport contracts, the associated material- and personnel-related expenses as well as any penalty payments. Changes in the estimations of these impending losses from pending transactions may have a considerable impact on the future income development.

The provisions for decommissioning are measured mainly on the basis of estimations that, for decommissioning and disposal costs, are derived mainly from sector-specific appraisals. The provisions are shown with their discounted settlement amount at the point at which they originate.

Movements in other provisions are shown in the following:

€ million	Personnel-related provisions 2022	Personnel-related provisions 2021	Revenue discounts 2022	Revenue discounts 2021	Provisions for impending losses 2022	Provisions for impending losses 2021	Decommissioning obligations 2022	Decommissioning obligations 2021	Environmental protection 2022	Environmental protection 2021	Other provisions 2022	Other provisions 2021	Total 2022	Total 2021
As of Jan 1	910	942	2,254	1,785	590	604	433	409	1,443	985	1,866	1,316	**7,496**	**6,041**
Currency translation effects	0	1	0	0	- 4	5	–	–	0	0	- 4	9	**- 8**	**15**
Changes in the scope of consolidation	- 5	1	- 24	1	–	–	–	–	–	–	10	1	**- 19**	**3**
thereof additions in scope of consolidation	0	1	–	1	–	–	–	–	–	–	19	1	**19**	**3**
thereof disposals in scope of consolidation	- 5	–	- 24	–	–	–	–	–	–	–	- 9	–	**- 38**	**–**
Amounts used	- 250	- 295	- 485	- 371	- 164	- 204	- 44	- 18	- 45	- 51	- 253	- 193	**- 1,241**	**- 1,132**
Reversals	-83	- 52	- 202	- 138	- 38	- 35	- 8	- 10	0	0	- 217	- 167	**- 548**	**- 402**
Reclassifications [1]	- 22	- 6	13	5	- 32	- 2	–	–	- 1	–	- 35	- 1	**- 77**	**- 4**
Additions	310	319	1,048	972	212	222	89	19	1	509	442	903	**2,102**	**2,944**
Compounding and discounting	- 32	0	–	–	- 19	0	- 5	33	- 15	–	- 64	- 2	**- 135**	**31**
As of Dec 31	**828**	**910**	**2,604**	**2,254**	**545**	**590**	**465**	**433**	**1,383**	**1,443**	**1,745**	**1,866**	**7,570**	**7,496**

[1] The reclassifications in the year under review related to the sale of DB Arriva's activities in Denmark, Poland and Serbia as well as DB Schenker's activities in Russia at a total of € 59 million.

The following table breaks down the other provisions into current and non-current amounts, and also details their estimated residual maturity:

€ million	Residual maturity: Up to 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	More than 5 years	Total more than 1 year	Total
AS OF DEC 31, 2022								
Personnel-related provisions	336	143	98	62	46	143	**492**	**828**
Revenue discounts	2,604	–	–	–	–	–	**–**	**2,604**
Provisions for impending losses	241	97	93	43	35	36	**304**	**545**
Decommissioning commitments	79	45	45	45	45	206	**386**	**465**
Environmental protection	55	58	59	57	52	1,102	**1,328**	**1,383**
Other provisions	1,295	106	99	61	60	124	**450**	**1,745**
Total	**4,610**	**449**	**394**	**268**	**238**	**1,611**	**2,960**	**7,570**
AS OF DEC 31, 2021								
Personnel-related provisions	356	143	101	65	49	196	**554**	**910**
Revenue discounts	2,254	–	–	–	–	–	**–**	**2,254**
Provisions for impending losses	255	97	100	72	31	35	**335**	**590**
Decommissioning commitments	37	45	44	44	44	219	**396**	**433**
Environmental protection	58	63	68	71	80	1,103	**1,385**	**1,443**
Other provisions	1,373	94	88	51	62	198	**493**	**1,866**
Total	**4,333**	**442**	**401**	**303**	**266**	**1,751**	**3,163**	**7,496**

Personnel-related provisions

Benefits arising on the occasion of the termination of employment agreements (severance packages) become payable if employees are released from their duties under the terms of an early retirement or semi-retirement scheme before the regular retirement age (which would not involve any reduction of retirement benefits) or if employees voluntarily terminate their employment contract in return for a severance package. Severance payments are recognized if there is a demonstrable commitment either to terminate the employment agreements of current employees in accordance with a detailed formal plan that cannot be reversed or to make severance payments if the employment contract is voluntarily terminated by employees within the framework of employment contract termination agreements.

Severance package commitments for agreements made as of the balance sheet date are recognized as other liabilities and – if they are not yet included in individual agreements and if they are part of a restructuring commitment in accordance with IAS 37 – are stated as other provisions.

Individual contractual agreements on part-time working in the lead-up to retirement are usually based on the block model. The top-up amounts paid in addition to salary by DB Group during the period of part-time working in the lead-up to retirement, as well as additional contributions to the statutory pension insurance scheme, are collected in installments up to the end of the active phase of the semi-retirement period and are recognized as provisions in accordance with IAS 19. The compensation backlog (plus the employer's contributions to social security insurance) for the additional work performed during the employment phase is also shown with the present pro rata present value as another non-current employee benefit.

If certain conditions are satisfied, under the collective bargaining agreement, DB Group offers its employees the opportunity to reduce their working hours to a level below their regular working hours (special semi-retirement arrangement). In these cases, the number of working hours is reduced to 81% of the reference or regular working hours, whereby the employees' remuneration is topped up to 90%. Payments into the company retirement benefit scheme are granted on the basis of 100% of the reference or regular working hours.

The personnel-related provisions were structured as follows:

AS OF DEC 31 / € million	2022	2021
Personnel contractual commitments	385	431
Early retirement and semi-retirement obligations	184	187
Service anniversary provisions	92	114
Other	167	178
Total	**828**	910

The personnel-related provisions included commitments arising from employment agreements that result from the entitlement of many employees under labor law and the willingness of DB AG not to terminate employment contracts for operational reasons. In such cases, DB Group will incur losses in the form of personnel expenses which will have to be borne until the employment contract is terminated or the employee is placed with another company; no reciprocal benefit will be provided in return for these costs (commitment surpluses relating to employment agreements). In addition, personnel contractual commitments included restructuring provisions.

A figure of about € 346 million was allocated to the provision for obligation surpluses from employment arrangements as of December 31, 2022 (as of December 31, 2021: € 395 million); this item accounted for a considerable percentage of the personnel-related provisions in DB Group. This provision recognizes the personnel-related commitments of DB AG for the employment guarantee included in the collective bargaining agreement designed to address demographic change (Demografietarifvertrag; DemografieTV).

The provisions for semi-retirement and early retirement commitments take into account the commitments arising from collective bargaining agreements, and have been calculated on the basis of actuarial reports. The regulations of DemografieTV on special part-time work in old age included an amount of € 86 million (as of December 31, 2021: € 82 million) for the entitlement of employees with many years of service and also many years of shift working to enjoy special semi-retirement benefits.

Revenue discounts

The increase in revenue discounts was mainly due to reductions at DB Regional in connection with concession fees as a result of the effects of the Covid-19 pandemic and the introduction of the temporary 9-Euro-Ticket and repayment risks from the industry solution for local public transport, which is intended to cushion the impact of Covid-19 for the industry.

Provisions for impending losses

The provisions for impending losses mainly relate to transport contracts in which commitment surpluses build up over the duration of the contracts. The additions related mainly to DB Regional and DB Arriva.

As of December 31, 2022, an amount of € 164 million (as of December 31, 2021: € 183 million) was allocated to DB Regional and € 8 million (as of December 31, 2021: € 17 million) to DB Arriva. This was due to various factors, including assumptions regarding reduced revenues from fares in future as well as higher maintenance expenses and higher energy prices. In particular, the estimates regarding the development of future revenues from fares are subject to particular uncertainty due to the Covid-19 crisis.

Decommissioning provisions

The provisions for decommissioning commitments referred to the pro rata decommissioning commitment in relation to a joint power generation plant. The valuation of the provision considered a standard cost increase rate in this sector of 3.25 % (as of December 31, 2021: 2.50 %) and a nominal interest rate of 3.00 % (as of December 31, 2021: 2.50 %). The 19th amendment to the Atomic Energy Act, which regulates fixed-term line operation no later than April 15, 2023, resulted in an additional allocation to decommissioning provisions of € 33 million in the year under review.

Provisions for environmental protection

Of the provisions for environmental protection € 1,374 million were allocated to DB AG as of December 31, 2022, (as of December 31, 2021: € 1,434 million). The change of € 60 million resulted from the utilization of restructuring obligations (€ 45 million) and an interest effect (€ 15 million). In order to take account of the remedial action obligations recognized in the environmental protection provisions, DB AG has set up various programs, including the following:

- the 4-stage soil decontamination program
- the 3-stage sewerage network program
- the 2-stage landfill shut-down program

The structured processing ensures that the procedure for recognizing, assessing the risk and taking appropriate remedial action is consistent with all legal requirements and optimized in terms of costs.

In the 4-stage soil decontamination program, existing soil and / or groundwater contamination is localized via the stages “historic exploration,” “orienting investigation” and “detailed investigation,” and is assessed on the basis of the relevant statutory testing criteria. If any negative change in soil conditions or ecological burdens is identified, implementation of the necessary remedial action is planned by the steps feasibility study, model planning and approval planning. The process of carrying out the remedial action is supported by a binding remedial action plan or a public-sector agreement with defined remedial action objectives.

The 3-stage sewerage network program aims to remedy any contamination of soil and / or groundwater resulting from leaks. The program also involves a plan to optimize the existing sewerage network to ensure that it is capable of meeting future requirements and to ensure that the need to take remedial action can be limited to this future network. The network that is not necessary for operation will be decommissioned. The sewerage program will be carried out via the stage 1 “recording,” stage 2 “inspection” and stage 3 “remedial action / decommissioning.” Legal requirements are set out in the Water Resources Accounting Act (Wasserhaushaltsgesetz; WHG), the Water Acts of the Federal states and the in-house control regulations.

The 2-stage program “shut-down of landfill sites” systematically records all legacy landfill sites operated by DB Group (stage 1). The requirements resulting from the Recycling Accounting Act (Kreislaufwirtschaftsgesetz; KrWG) and the Landfill Site Regulation (Deponieverordnung; DepV) are used as the basis for planning and implementing the processes of decommissioning and recultivating the areas (stage 2a) and the subsequent maintenance (stage 2b).

Other provisions

The other provisions comprised provisions for project risks, compensation for damages, real estate risks, decommissioning and demolition obligations, guarantee and warranty obligations, insurance and project risks, third-party obligations for maintenance and other tax risks as well as numerous other issues which individually are of minor significance.

(33) DEFERRED ITEMS

DB Group receives various public-sector grants, which are generally granted in relation to assets or income. The grants are recognized in the balance sheet as soon as it is certain that they will be provided and as soon as the conditions necessary for receiving the grants have been satisfied. The grants related to assets, and in particular investment grants, are deducted directly from the assets for which the grants have been received. The interest benefit (spread between nominal value and present value) of interest-free loans is deferred on the basis of the contractual grant conditions. The income from pro rata reversal of these accruals is shown as other operating income.

The deferred items contained the following:

AS OF DEC 31 / € million	2022	2021
Deferred public-sector grants	137	145
Deferred revenues	904	724
Other	384	380
Total	**1,425**	**1,249**
Non-current share	526	406
Current share	899	843

The changes to deferred revenues resulted from the DB Long-Distance and DB Regional segments.

€ million	2022	2021
As of Jan 1	0	67
Reversals	–	–67
As of Dec 31	**0**	**0**

Deferred revenues constituted that part of compensation that is attributable to the period after the balance sheet date.

Notes to the statement of cash flows

The statement of cash flows shows the changes in cash and cash equivalents in the year under review, and was prepared in accordance with IAS 7 (Statement of Cash Flows). The indirect method has been used for showing cash flow from operating activities.

Interest income and interest payments, dividend income as well as tax payments are stated under operating activities.

Cash and cash equivalents include the cash and cash equivalents stated in the balance sheet with a residual maturity of up to three months (cash in hand, cash at banks as well as security investments). As of December 31, 2022, € 1,277 million of the cash and cash equivalent (as of December 31, 2021: € 1,162 million) was subject to restrictions mainly as a result of provisions of the rail franchises in the United Kingdom as well as due to country-specific and contractual restrictions particularly in international logistics business.

Current receivables due from banks (as of December 31, 2022: € 142 million; as of December 31, 2021: € 83 million), resulting from collateral agreements in connection with financial futures, are shown under current other receivables and assets. Because it is becoming increasingly difficult to predict the development in the value of the financial futures, it can only be assumed to a limited extent that such hedges represent current liquidity.

CASH FLOW FROM OPERATING ACTIVITIES

The cash flow from operating activities is calculated by adjusting the net profit/loss for the period before taxes by items that are not cash-effective (in particular additions to and reversals of other provisions) and by adding other changes in current assets, in liabilities (excluding financial debt) and provisions. The cash flow from operating activities is then established after due consideration is given to interest and tax payments.

In accordance with IFRS 16, outflows related to leases are recognized in cash flow from financing activities if they are redemption payments, and are recognized in cash flow from operating activities if they are payments of interest.

The cash flow from operating activities has increased considerably in the year under review. This was due to a significantly higher net profit for the year, adjusted for reduced depreciation on property, plant and equipment and intangible assets, lower trade liabilities and reduced non-cash expenses.

Non-cash expenses and income decreased in the year under review, particularly as a result of a significantly lower balance of expenses from additions to and reversals of other provisions (€ +553 million).

CASH FLOW FROM INVESTING ACTIVITIES

The cash flow from investing activities is calculated as the cash inflow provided by the disposal of property, plant and equipment and intangible assets as well as by investment grants, and the cash outflow for capital expenditures in property, plant and equipment and intangible assets, as well as cash flow from the addition and disposal of non-current financial assets.

Payments received from investment grants are shown under investing activities due to the close connection between investment grants received and the payments made for capital expenditures in property, plant and equipment assets.

The significant increase in cash outflow from investing activities resulted in particular from increased payments for investments in financial assets, especially for investments in short-term money-market funds (€ 501 million) and from the acquisition of shares in consolidated companies (in the year under review: € 272 million; previous year: € 45 million). Capital expenditures on property, plant and equipment increased slightly by € 128 million. In contrast, the net inflow from investment grants fell (€ –491 million; –5.5%). On balance, inflows and outflows for investments in financial assets included outflows of € 326 million to pay for investments from the acquisition of transport concessions (IFRIC 12).

When changes take place in the scope of consolidation as a result of the acquisition or sale of companies, the acquisition price paid (excluding any liabilities that are transferred) less the acquired or sold financial resources are stated as cash flow from investing activities.

CASH FLOW FROM FINANCING ACTIVITIES

The cash flow from financing activities is due to additions to capital, the net inflows and outflows attributable to senior bonds issued, changes in bank borrowings and loans as well as outflows for the redemption of finance leasing liabilities and interest-free loans.

The cash inflow from financing activities decreased by a further € 748 million. This was due in particular to a decline in the net outflow from the raising and repayment of funds of, mainly from the repayment of bank debts and a reduced net inflow from the issue and redemption of senior bonds. In addition, there were lower proceeds from capital injections and reduced redemption payments for leases.