

13. Property, plant and equipment and intangible assets

	Note	Dec 31 2016	Dec 31 2015
Non-current assets of the downstream segment	13.1	8,431,723	8,019,780
Property, plant and equipment	13.1.1	8,261,718	7,845,051
Intangible assets, including:		170,005	174,729
Goodwill	13.1.2	45,562	45,562
Other intangible assets	13.1.3	124,443	129,167
Non-current assets of the upstream segment	13.2	2,871,791	3,213,061
Property, plant and equipment		2,389,960	2,723,371
Intangible assets, including:		481,831	489,690
Goodwill		1,126	1,126
Other intangible assets		480,705	488,564
Total property, plant and equipment and intangible assets		11,303,514	11,232,841
including:			
Property, plant and equipment		10,651,678	10,568,422
Intangible assets		651,836	664,419

13.1 Non-current assets of the downstream segment

13.1.1 Property, plant and equipment of the downstream segment

	Land	Buildings, structures	Plant and equipment	Vehicles, other	Property, plant and equipment under construction	Total
Gross carrying amount Jan 12 016	510,178	4,474,591	5,556,358	620,198	395,883	11,557,208
Purchase	-	-	-	20,431	903,139	923,570 ⁽¹⁾
Transfer from property, plant and equipment under construction	12,771	93,045	53,376	49,485	(208,677)	-
Borrowing costs	-	-	-	-	4,775	4,775

Reclassification to non-current assets (or disposal group) held for sale	-	-	-	(2,095)	-	(2,095)
Disposal	(5,600)	(5,696)	(15,298)	(12,072)	(378)	(39,044)
Other	-	412	(1,145)	(8,709)	(2,748)	(12,190)
Gross carrying amount Dec 31 2016	517,349	4,562,352	5,593,291	667,238	1,091,994	12,432,224
Accumulated depreciation Jan 1 2016	14,796	1,436,898	1,926,322	266,690	-	3,644,706
Depreciation	1,733	174,853	236,117	61,612	-	474,315
Reclassification to non-current assets (or disposal group) held for sale	-	-	-	(1,363)	-	(1,363)
Disposal	(448)	(2,623)	(14,446)	(9,127)	-	(26,644)
Other	-	224	575	1,624	-	2,423
Accumulated depreciation Dec 31 2016	16,081	1,609,352	2,148,568	319,436	-	4,093,437
Impairment losses Jan 1 2016	1,158	44,411	5,731	2,576	13,575	67,451
Recognised	349	11,307	919	1,965	-	14,540
Used/Reversed	(56)	(4,254)	(255)	(357)	-	(4,922)
Impairment losses Dec 31 2016	1,451	51,464	6,395	4,184	13,575	77,069
Net carrying amount Dec 31 2016	499,817	2,901,536	3,438,328	343,618	1,078,419	8,261,718

⁽¹⁾ Capital expenditure included chiefly expenditure on the construction of a delayed coking unit with auxiliary infrastructure of the EFRA Project (PLN 672,291 thousand), expansion of the service station chain (PLN 105,503 thousand), and construction of the hydrogen recovery unit (PLN 55,632 thousand).

	Land	Buildings, structures	Plant and equipment	Vehicles, other	Property, plant and equipment under construction	Total
Gross carrying amount Jan 1 2015	482,078	4,390,585	5,527,810	526,882	171,339	11,098,694
Purchase	-	-	-	4,752	432,422	437,174 ⁽²⁾
Transfer from property, plant and equipment under construction	29,645	91,335	50,834	34,139	(205,953)	-
Borrowing costs	-	-	-	-	1,331	1,331
Disposal	(1,910)	(9,191)	(21,306)	(36,832) ⁽¹⁾	(303)	(69,542)
Finance lease	-	-	24	97,344	-	97,368
Other	365	1,862	(1,004)	(6,087)	(2,953)	(7,817)
Gross carrying amount Dec 31 2015	510,178	4,474,591	5,556,358	620,198	395,883	11,557,208
Accumulated depreciation Jan 1 2015	13,176	1,270,085	1,710,170	265,150	-	3,258,581

Depreciation	1,620	172,515	235,272	44,142	-	453,549
Disposal	-	(6,709)	(19,668)	(36,293) ⁽¹⁾	-	(62,670)
Finance lease	-	-	-	(7,344)	-	(7,344)
Other	-	1,007	548	1,035	-	2,590
Accumulated depreciation Dec 31 2015	14,796	1,436,898	1,926,322	266,690	-	3,644,706
Impairment losses Jan 12 2015	1,067	37,466	5,176	1,863	13,601	59,173
Recognised	-	9,991	721	754	15	11,481
Used/Reversed	-	(3,951)	(166)	(41)	(41)	(4,199)
Other	91	905	-	-	-	996
Impairment losses Dec 31 2015	1,158	44,411	5,731	2,576	13,575	67,451
Net carrying amount Dec 31 2015	494,224	2,993,282	3,624,305	350,932	382,308	7,845,051

⁽¹⁾ Including retirement of worn-out spare parts in the amount of PLN 19,513 thousand

⁽²⁾ Capital expenditure included chiefly expenditure on the construction of a delayed coking unit with auxiliary infrastructure of the EFRA Project (PLN 191,488 thousand), expansion of the service station chain (PLN 130,230 thousand), and construction of the hydrogen recovery unit (PLN 44,434 thousand).

Property, plant and equipment of the downstream segment include chiefly Group's assets related to refining and marketing activities, such as the refinery infrastructure, service station network, rolling stock, storage depots, and property on which the production plants, production units, and office buildings are located.

Impairment losses on service stations

In 2016, LOTOS Paliwa Sp. z o.o. recognised an impairment loss on service station assets totalling PLN 13,122 thousand (2015: PLN 10,288 thousand); see [Note 9.4](#). The recoverable amount of property, plant and equipment related to the service station network was determined based on the value in use of each station, calculated with the discounted cash flow method. Future cash flows were calculated based on five-year cash-flow projections, prepared using budget projections for 2017 (in 2015: for 2016) and the cash inflow and outflow plan for subsequent years, based on the development strategy until 2020. The residual value for the discounted cash flows was calculated using the growing perpetuity formula. LOTOS Paliwa Sp. z o.o.'s net weighted average cost of capital (WACC) was assumed at 8.22% (2015: 7.3%), based on the company's financing structure.

Calculation of the value in use of cash-generating units is most sensitive to the following variables:

- gross margin, which depends on average values of unit margins in the period preceding the budget period (a 4.5% average year-on-year margin increase was assumed),
- discount rates, reflecting risks typical to the cash-generating unit (the median for five-year PLN-denominated notes quoted by Reuters in November 2015 was adopted),
- volumes based on fuel consumption growth rate (an 11% increase was assumed),
- market share in the budget period (a stable market share was assumed),
- growth rate used to extrapolate cash-flow projections beyond the budget period, based on a quantitative forecast of the fuel consumption growth rate in Poland in 2014–2020, prepared using POPiHN, GUS, NBP and JBC reports (for gasolines), and based on GDP market consensus. In the case of diesel oil, the data included also the market consensus on GDP and its constituent elements sourced from IBNGR, BZWBK, MILLENIUM, NBP, MG, EBOIR, WFM, OECD, KE, and ERSTE GROUP.

13.1.2 Goodwill of the downstream segment

Goodwill is allocated to cash-generating units, as presented in the table below:

	Dec 31 2016	Dec 31 2015
Goodwill arising on the acquisition of an organised part of business by LOTOS Paliwa Sp. z o.o.:		
- wholesale of LPG	10,009	10,009
- service stations networks (ESSO, Slovnaft Polska)	33,691	33,691
Total	43,700	43,700
Goodwill arising on acquisition of other entities	1,862	1,862
Total goodwill	45,562	45,562

As at December 31st 2016 and December 31st 2015, impairment tests of individual cash-generating units to which goodwill was allocated did not reveal any impairment indicators.

The Group determines the recoverable amount of cash-generating units based on their respective values in use, calculated on the basis of a five-year cash flow projection. The residual value for the discounted cash flows was calculated using the growing perpetuity formula. The discount rate adopted for the calculation reflects net WACC of 8.22% (2015: 7.3%).

The most material factors affecting the estimated values in use of cash-generating units were: gross margin, discount rate, volumes forecast, projected market shares in the budget period and estimated growth rate beyond the forecast period.

The Group believes that no reasonably probable change in the key parameters identified above would result in goodwill impairment.

13.1.3 Other intangible assets of the downstream segment

	Patents, trademarks and licences	Other	Intangible assets under development	Total
Gross carrying amount Jan 12 016	197,907	36,297	18,855	253,059
Purchase	-	198	6,962	7,160
Transfer from intangible assets under development	7,679	895	(8,574)	-
Borrowing costs	-	-	65	65
Other	(240)	(306)	-	(546)
Gross carrying amount Dec 31 2016	205,346	37,084	17,308	259,738
Accumulated amortisation Jan 12 016	100,883	13,944	-	114,827
Amortisation	10,428	1,172	-	11,600
Other	(56)	(141)	-	(197)
Accumulated amortisation Dec 31 2016	111,255	14,975	-	126,230
Impairment losses Jan 12 016	7	25	9,033	9,065

Recognised	-	-	-	-
Used/Reversed	-	-	-	-
Impairment losses Dec 31 2016	7	25	9,033	9,065
Net carrying amount Dec 31 2016	94,084	22,084	8,275	124,443
Gross carrying amount Jan 12 015	192,477	43,953	12,804	249,234
Purchase	-	84	12,145	12,229
Transfer from intangible assets under development	5,721	393	(6,114)	-
Borrowing costs	-	-	52	52
Disposal	(154)	(7,768) ⁽¹⁾	(30)	(7,952)
Other	(137)	(365)	(2)	(504)
Gross carrying amount Dec 31 2015	197,907	36,297	18,855	253,059
Accumulated amortisation Jan 12 015	91,219	13,304	-	104,523
Amortisation	9,816	1,237	-	11,053
Disposal	(152)	(606)	-	(758)
Other	-	9	-	9
Accumulated amortisation Dec 31 2015	100,883	13,944	-	114,827
Impairment losses Jan 12 015	7	8	9,033	9,048
Recognised	-	17	-	17
Used/Reversed	-	-	-	-
Impairment losses Dec 31 2015	7	25	9,033	9,065
Net carrying amount Dec 31 2015	97,017	22,328	9,822	129,167

⁽¹⁾ Including retirement of CO₂ emission allowances of PLN 7,163 thousand, used for own needs.

Intangible assets of the downstream segment include licences relating to technological processes, including licences for technologies used in the refinery, licences for fuel production, storage and trading, software licences, patents, trademarks and acquired CO₂ emission allowances.

13.2 Non-current assets of the upstream segment

	Note	Dec 31 2016	Dec 31 2015
Exploration and evaluation assets	13.2.1	396,670	462,126
Property, plant and equipment		55,624	118,759

Intangible assets		341,046	343,367
Development and production assets	13.2.2	2,098,270	2,316,381
Property, plant and equipment		1,966,931	2,182,903
Intangible assets		131,339	133,478
Other non-current assets	13.2.3	376,851	434,554
Property, plant and equipment		367,405	421,709
Intangible assets		9,446	12,845
Total non-current assets of the upstream segment		2,871,791	3,213,061
including:			
Property, plant and equipment		2,389,960	2,723,371
Intangible assets		481,831	489,690

13.2.1 Exploration and evaluation assets

	Note	Property, plant and equipment classified as exploration and evaluation assets		Intangible assets classified as exploration and evaluation assets		Total
		Poland	Poland	Norway	Lithuania	
Gross carrying amount Jan 12016		167,756	9,878	467,240	10,211	655,085
Purchase		1,692	361	51,951 ⁽²⁾	-	54,004
Exchange differences on translating foreign operations		-	-	43,627	389	44,016
Expenditure written off due to project discontinuation	9.4	(1,904) ⁽¹⁾	(940) ⁽¹⁾	(133,063) ⁽³⁾	-	(135,907)
Gross carrying amount Dec 312016		167,544	9,299	429,755	10,600	617,198
Accumulated depreciation and amortisation Jan 12016		-	8,046	-	-	8,046
Depreciation and amortisation		-	1,627	-	-	1,627
Expenditure written off due to project discontinuation	9.4	-	(705) ⁽¹⁾	-	-	(705)
Accumulated depreciation and amortisation Dec 312016		-	8,968	-	-	8,968

Impairment losses Jan 12016		48,997	235	125,470	10,211	184,913
Recognised	9.4	64,827 ⁽¹⁾	-	73,364 ⁽⁴⁾	-	138,191
Exchange differences on translating foreign operations		-	-	10,942	389	11,331
Used/Reversed	9.4	(1,904) ⁽¹⁾	(235) ⁽¹⁾	(120,736) ⁽³⁾	-	(122,875)
Impairment losses Dec 31 2016		111,920	-	89,040	10,600	211,560
Net carrying amount Dec 31 2016		55,624	331	340,715	-	396,670

⁽¹⁾ Expenditure on exploration and evaluation activities related to the Stupsk area (decision to abandon the project) and the Gaz Południe area (a PLN 64,785 thousand write-off of expenditure on seismic surveys).

⁽²⁾ Including expenditure on Sleipner assets (PLN 18,731 thousand) and Heimdal assets (PLN 31,206 thousand).

⁽³⁾ Capitalised expenditures related to PL643 and PL655 licences (effect on the Group's profit/(loss): PLN 12,327 thousand).

⁽⁴⁾ Including the Utgard (formerly Alfa Sentral) field assets of PLN 67,615 thousand and PL797 licence of PLN 5,749 thousand.

	Note	Property, plant and equipment classified as exploration and evaluation assets		Intangible assets classified as exploration and evaluation assets		Total
		Poland	Poland	Norway	Lithuania	
Gross carrying amount Jan 12015		91,930	13,012	314,806	10,213	429,961
Purchase		27,372	15	8,100	-	35,487
Acquisition of Sleipner assets		-	-	188,471 ⁽⁴⁾	-	188,471
Exchange differences on translating foreign operations		-	-	(29,291)	(2)	(29,293)
Reclassification to exploration and evaluation assets		60,577 ⁽¹⁾	-	-	-	60,577
Expenditure written off due to project discontinuation	9.4	(12,123) ⁽²⁾	(3,149) ⁽²⁾	(14,846) ⁽⁵⁾	-	(30,118)
Gross carrying amount Dec 31 2015		167,756	9,878	467,240	10,211	655,085
Accumulated depreciation and amortisation Jan 12015		-	7,277	-	-	7,277
Depreciation and amortisation		-	3,663	-	-	3,663
Expenditure written off due to project discontinuation	9.4	-	(2,894) ⁽²⁾	-	-	(2,894)
Accumulated depreciation and amortisation Dec 31 2015		-	8,046	-	-	8,046
Impairment losses Jan 12015		47,161	-	134,078	-	181,239
Recognised	9.4	1,836 ⁽³⁾	235 ⁽³⁾	-	10,027 ⁽⁶⁾	12,098

Exchange differences on translating foreign operations	-	-	(8,608)	184	(8,424)
Used/Reversed	-	-	-	-	-
Impairment losses Dec 31 2015	48,997	235	125,470	10,211	184,913
Net carrying amount Dec 31 2015	118,759	1,597	341,770	-	462,126

(1) Related to operations on the Gaz Południe, Gotlandia, Łeba and Rozewie licence areas, which will be continued in 2016 in line with the upstream segment management's decision. Applications were filed to convert the Łeba and Rozewie licences into combined oil and gas exploration, appraisal and production licences.

(2) Expenditure on exploration and evaluation activities related to the Sambia E field (effect on the Group's profit/(loss): PLN 12,378 thousand).

(3) Stupsk area assets (effect on the Group's profit/(loss): PLN 2,071 thousand).

(4) Utgard (formerly Alfa Sentral) and PL046 licences forming part of the acquired Sleipner assets in Norway (for more information on the transaction, see [Note 13.1.3](#) to the *Consolidated financial statements for 2015*).

(5) Expenditure related to Heimdal assets □ Fulla (PL362 and PL035B) and PL503 licence.

(6) Expenditure on seismic surveys.

Property, plant and equipment are classified as exploration and evaluation assets until the technical feasibility and commercial viability of extracting the discovered resources are demonstrated.

Impairment of assets of the Sleipner gas field in Norway

As at December 31st 2016, the Group tested the Utgard (previously Alfa Sentral) field at a pre-development stage for impairment. The test was performed based on the following assumptions, equivalent to those adopted for development and production assets:

- the cash flow projection period was assumed to equal the asset's planned life,
- the discount rate was assumed to equal the weighted average cost of capital, and was calculated at 7.63% after taxation with the 78% marginal tax rate (applicable in Norway),
- production and sales volumes, capital expenditure, operating expenses and field decommissioning costs were assumed as projected by the field operators.

The following price assumptions were adopted:

- for crude oil in USD/bbl (per barrel):

- 2017–2019 – prices in line with the price assumptions for the available market scenarios,
- 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation,

- for natural gas in p/th (pence/thermal units):

- 2017–2019 – prices in line with the price assumptions for the available market scenarios, and in 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation.

The USD/NOK exchange rate used for the purposes of the impairment test is a cross rate calculated based on forward curves for the EUR/USD and EUR/NOK currency pairs.

The measurement of the recoverable amount showed the necessity to recognise an impairment loss on those assets in the amount of PLN 67,615 thousand (NOK 143,100 thousand), see [Note 9.4](#).

Due to significant market volatility, in particular with respect to oil and gas prices, the adopted assumptions may be subject to justifiable changes, and such changes may necessitate a revision of the carrying amounts of the Utgard field's assets in the

future. To determine the effect of key factors on the test results, the Group carried out an analysis of sensitivity to a -15%/+15% change in oil and gas price, -15%/+15% change in production volumes, and -15%/+15% change in the USD/NOK exchange rate. The table below presents the estimated changes in impairment losses following changes in the key assumptions:

Factor	Change	Impact on impairment losses PLN '000	
Crude oil and gas prices	+/- 15%	49,618	- 47,498
Production volume	+/- 15%	38,292	- 38,291
USD/NOK exchange rate	+/- 15%	41,242	- 41,240
Discount rate	+/- 0,5 pp	- 4,914	5,052

13.2.2 Development and production assets

	Note	Development assets			Production assets			Total	
		Poland	Norway	Total	Poland	Norway	Lithuania		
Gross carrying amount Jan 12016		-	1,452,412	1,452,412	1,384,677	1,497,203	636,138	3,518,018	4,970,430
Purchase		-	12,026 ⁽¹⁾	12,026	213,183 ⁽²⁾	46,259 ⁽⁵⁾	78	259,520	271,546
Exchange differences on translating foreign operations		-	127,705	127,705	-	146,438	24,252	170,690	298,395
Estimated costs of decommissioning of oil and gas extraction facilities		-	-	-	(2,921)	(87,911)	(389)	(91,221)	(91,221)
Reclassification to production assets		-	-	-	58,549 ⁽³⁾	-	-	58,549	58,549
Expenditure written off due to project discontinuation		-	-	-	(3,257) ⁽⁴⁾	-	-	(3,257)	(3,257)
Other		-	-	-	215	1,383	(321)	1,277	1,277
Gross carrying amount Dec 312016		-	1,592,143	1,592,143	1,650,446	1,603,372	659,758	3,913,576	5,505,719
Accumulated depreciation and amortisation Jan 12016		-	-	-	398,384	310,265	258,063	966,712	966,712
Depreciation and amortisation		-	-	-	38,806	471,819	25,061	535,686	535,686
Exchange differences on translating foreign operations		-	-	-	-	44,877	10,113	54,990	54,990
Reclassification to production assets		-	-	-	27,061 ⁽³⁾	-	-	27,061	27,061
Expenditure written off due to project discontinuation	9.4	-	-	-	(3,257) ⁽⁴⁾	-	-	(3,257)	(3,257)
Other		-	-	-	(35)	-	(310)	(345)	(345)

Accumulated depreciation and amortisation Dec 31 2016	-	-	-	460,959	826,961	292,927	1,580,847	1,580,847
Impairment losses Jan 12 016	-	1,452,412	1,452,412	-	40,627	194,298	234,925	1,687,337
Recognised 9.4	-	-	-	-	-	12,437 ⁽⁷⁾	12,437	12,437
Exchange differences on translating foreign operations	-	127,341	127,341	-	3,874	7,462	11,336	138,677
Used/Reversed 9.4	-	-	-	-	(4,357) ⁽⁶⁾	(7,492) ⁽⁸⁾	(11,849)	(11,849)
Impairment losses Dec 31 2016	-	1,579,753	1,579,753	-	40,144	206,705	246,849	1,826,602
Net carrying amount Dec 31 2016	-	12,390	12,390	1,189,487	736,267	160,126	2,085,880	2,098,270

⁽¹⁾ Expenditure on the YME field.

⁽²⁾ Expenditure on the development of the B-8 field (PLN 212,412 thousand) and the B-3 field (PLN 771 thousand).

⁽³⁾ Offshore gas pipeline from the B-3 field.

⁽⁴⁾ Expenditure associated to the Pila area (no effect on the LOTOS Group's profit/(loss)).

⁽⁵⁾ Expenditure on Sleipner assets (PLN 42,495 thousand) and Heimdal assets (PLN 3,565 thousand).

⁽⁶⁾ Expenditure on Heimdal assets.

⁽⁷⁾ Production infrastructure on the Auksoras, Vaidiai, Kretinga, Ablinga and Liiai fields.

⁽⁸⁾ Girkaliai field.

	Note	Non-current development assets			Non-current production assets				Total
		Poland	Norway	Total	Poland	Norway	Lithuania	Total	
Gross carrying amount Jan 12 015		578,046	1,535,085	2,113,131	512,840	582,851	628,336	1,724,027	3,837,158
Purchase	304,332 ⁽¹⁾		-	304,332	2,194	3,903	8,290	14,387	318,719
Acquisition of Sleipner assets		-	-	-	-	394,956 ⁽⁵⁾	-	394,956	394,956
Exchange differences on translating foreign operations		-	(84,158)	(84,158)	-	(87,469)	48	(87,421)	(171,579)
Recognition of assets related to future costs of decommissioning of oil and gas extraction facilities		-	-	-	-	605,423 ⁽⁴⁾	-	605,423	605,423
Estimated costs of decommissioning of oil and gas extraction facilities		10,054	1,485	11,539	(304)	5,480	(250)	4,926	16,465
Reclassification to development assets	30,857 ⁽²⁾		-	30,857	-	-	-	-	30,857
Reclassification of development assets to production assets	(865,348) ⁽³⁾		-	(865,348)	865,348 ⁽³⁾	-	-	865,348	-
Reclassification to non-current assets (or disposal groups) held for sale	(45,011) ⁽⁴⁾		-	(45,011)	-	-	-	-	(45,011)

Reversal of assets related to decommissioning of oil and gas extraction facilities	26.1	(2,750)	-	(2,750)	-	-	-	-	(2,750)
Other		(10,180)	-	(10,180)	4,599	(7,941)	(286)	(3,628)	(13,808)
Gross carrying amount Dec 31 2015		-	1,452,412	1,452,412	1,384,677	1,497,203	636,138	3,518,018	4,970,430
Accumulated depreciation and amortisation Jan 12 015		55,696	-	55,696	317,301	199,741	220,384	737,426	793,122
Depreciation and amortisation		2,427	-	2,427	23,104	129,831	37,320	190,255	192,682
Exchange differences on translating foreign operations		-	-	-	-	(19,307)	645	(18,662)	(18,662)
Reclassification of development assets to production assets		(58,123) ⁽³⁾	-	(58,123)	58,123 ⁽³⁾	-	-	58,123	-
Other		-	-	-	(144)	-	(286)	(430)	(430)
Accumulated depreciation and amortisation Dec 31 2015		-	-	-	398,384	310,265	258,063	966,712	966,712
Impairment losses Jan 12 015		-	1,535,085	1,535,085	-	43,415	134,509	177,924	1,713,009
Recognised	9.4	-	1,485	1,485	-	-	58,733 ⁽⁶⁾	58,733	60,218
Exchange differences on translating foreign operations		-	(84,158)	(84,158)	-	(2,786)	1,056	(1,730)	(85,888)
Used/Reversed		-	-	-	-	(2)	-	(2)	(2)
Impairment losses Dec 31 2015		-	1,452,412	1,452,412	-	40,627	194,298	234,925	1,687,337
Net carrying amount Dec 31 2015		-	-	-	986,293	1,146,311	183,777	2,316,381	2,316,381

⁽¹⁾ Expenditure on the B-8 field (platform conversion, modifications to the transmission infrastructure and water injection wells).

⁽²⁾ Related to prepayments for capital expenditure on the development of the B-8 field.

⁽³⁾ Reclassification of expenditure following production launch in the B-8 field.

⁽⁴⁾ As a result of the change of the technical concept for the project to convert the Petrobaltic rig into a production centre in the B-8 field, the Group reclassified the field development assets related to the project to assets held for sale (see [Note 17](#)). The assets represented expenditure incurred by LOTOS Petrobaltic S.A. on elements of the tubular legs of the rig, for which an impairment loss of PLN 36,634 thousand was recognised (see [Note 9.4](#)) and which were recognised as non-current assets (or disposal groups) held for sale valued at PLN 8,377 thousand, the value being in the Management Board's opinion the net realisable value of the tubular legs (based on an analysis of current steel prices in Poland and on foreign markets, made by LOTOS Petrobaltic S.A.).

⁽⁵⁾ Acquisition of Sleipner assets in Norway (for more information on the transaction, see [Note 13.1.3](#) to the *Consolidated financial statements for 2015*).

⁽⁶⁾ Assets related to the Kretinga, Nausodis, Girkalai, Vezaiciai, Liliiai and Ablingga fields.

Impairment testing of assets in the B-8 field in the Baltic Sea

As at December 31st 2016 and December 31st 2015, the Group performed impairment tests for production assets related to the B-8 field.

Key assumptions underlying computation of the recoverable amount of the tested assets:

- the cash flow projection period was assumed to equal the asset's planned life,
- the discount rate was assumed to equal the weighted average cost of capital, and was calculated at 10.07% (2015: 9.70) after taxation with the 19% marginal tax rate,
- production volumes were assumed to be in line with a competent person report prepared by Miller & Lents based on available current geological information,
- sales volumes, capital expenditure, operating expenses and field decommissioning costs were assumed in line with current projections for the B-8 field.

The following price assumptions were adopted for the estimates as part of the impairment test as at December 31st 2016:

- for crude oil in USD/bbl (per barrel of oil equivalent):

- 2017–2022 – prices in line with the price assumptions for the available market scenarios,
- 2023 and beyond – prices remaining stable in the long term on par with the 2022 level, adjusted for inflation.

The following assumptions were adopted for the estimates as part of the impairment test as at December 31st 2015:

- for crude oil in USD/bbl (per barrel of oil equivalent):

- 2016–2019 – prices in line with the price assumptions for the available market scenarios,
- 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation.

The impairment test of the B-8 field's development assets indicated no need to recognise impairment losses on the assets.

Due to significant market volatility, in particular with respect to crude oil prices, the adopted assumptions may be subject to justifiable changes, and such changes may necessitate a revision of the carrying amounts of the field's assets in the future. Therefore, the Group points to a number of uncertainties as to the recoverable amount of the assets:

- volatility of market prices of crude oil,
- estimates of investment expenditure related to contracts for which no contractor has yet been selected,
- amount of reclamation commitments,
- volatility of the PLN/USD exchange rate,
- discount rates.

To determine the effect of key factors on the test results, the Group carried out an analysis of sensitivity to a -15%/+15% change in oil and gas prices, -15%/+15% change in production volumes, -15%/+15% change in the USD/PLN exchange rate, and -0.5%/+0.5% change in the discount rate.

It was shown that the changes in the key assumptions had no effect on the impairment losses on the B-8 field's assets.

Progress of the YME field development project in Norway

Due to significant delays in the implementation of the YME project, cost overruns, and defects of the MOPU (Mobile Offshore Production Unit) to be used in production operations in the field, in previous years the Group recognised impairment losses on the YME assets until they were fully written off in 2014.

On August 22nd 2016, the YME project partners completed activities to remove the defective MOPU from the field, financed with funds raised by the consortium members (the Group has a 20% interest in the project) under an agreement with the

supplier of the MOPU (see [Note 26.1](#)). The amount of expected further costs related to the arrangement (most of which have been already contracted) was reflected in these financial statements by updating relevant provisions in accordance with the best current knowledge of the Management Board as at the date of these statements (see [Note 26.1](#)).

On December 12th 2016, the consortium partners approved a resolution to proceed with work on further development of the field and preparation of the Front-End Engineering Design with a view to drafting a revised field development plan. The revised development plan is to be approved by the Norwegian authorities by the end of 2017.

Given the nature of the Joint Operating Agreement between the YME project partners, and in connection with the guarantees issued by LOTOS Petrobaltic S.A. for the benefit of the Norwegian government with respect to LOTOS E&P Norge AS's exploration and production activities on the Norwegian Continental Shelf, the Group takes into account that it may have to incur further capital expenditure on the YME field and to revalue the expected decommissioning costs, in particular once the revised field development plan is prepared, the YME field decommissioning concept is selected, and the Norwegian authorities approve the adopted plans. The initial assumption is that after production is launched on the basis of the revised field development plan in 2019, decommissioning of the YME project will take place in 2028-2032.

In the opinion of LOTOS E&P Norge AS, the amount of the provision for decommissioning of the YME field infrastructure (see [Note 26.1](#)) reflects the necessary commitment by the Group if the scenario of complete decommissioning materialises by 2032. This is a consequence of the phase (currently under way) of preparation of the revised field development plan and the YME field infrastructure decommissioning plan, which were adopted by the consortium with the votes of the majority of its members and reflected in the project budget, taking into account a reduction in the decommissioning cost estimate for 2028-2032. The cost estimate was reduced by an amount corresponding to a portion of the conditional budget in connection with a drop in the market cost of related services in Norway following the decline in market prices of hydrocarbons and no forecasts of a possible material change in their levels in the period covered by the analysis.

Considering the recognised impairment losses on the YME expenditure and the incurred tax losses that may be carried forward, the Group recognised a deferred tax asset in the consolidated statement of financial position as at December 31st 2016. The total amount of the tax assets related to the Group's operations in Norway was PLN 523m as at December 31st 2016. Given that under the Norwegian tax legislation tax losses can be carried forward indefinitely, and that the Group is generating revenue from operations in the producing Sleipner gas field and the offshore gas and condensate production facility in the Heimdal field, the Management Board believes that the deferred tax assets recognised as at December 31st 2016 are fully realisable in the amount disclosed in these consolidated financial statements.

Impairment testing of the production assets of the offshore gas and condensate production facility in the Heimdal field and of the Sleipner gas field in Norway

As at December 31st 2016, the Group tested for impairment the production assets of each centre generating cash flows from producing Heimdal and Sleipner fields. As at December 31st 2015, the Group performed impairment tests for the Heimdal fields. Their results indicated no necessity to recognise impairment losses on those assets either.

As part of impairment testing of the Norwegian production assets, their recoverable amount was determined at their fair value estimated using the discounted future cash flows method.

Key assumptions underlying computation of the recoverable amount of the tested assets:

- the cash flow projection period was assumed to equal the asset's planned life,
- the discount rate was assumed to equal the weighted average cost of capital, and was calculated at 7.63% (2015: 7.33%) after taxation with the 78% marginal tax rate (applicable in Norway),
- production and sales volumes, capital expenditure, operating expenses and field decommissioning costs were assumed as projected by the field operators.

The following price assumptions were adopted for the purposes of the impairment tests as at December 31st 2016:

- for crude oil in USD/bbl (per barrel):

- 2017–2019 – prices in line with the price assumptions for the available market scenarios,
- 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation,

- for natural gas in p/th (pence/thermal units):

- 2017–2019 – prices in line with the price assumptions for the available market scenarios, and in 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation.

The following assumptions were adopted for the estimates as part of the impairment tests as at December 31st 2015:

- for crude oil in USD/bbl (per barrel):

- 2016–2019 – prices in line with the price assumptions for the available market scenarios,
- 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation,

- for natural gas in p/th (pence/thermal units):

- 2016–2019 – prices in line with the price assumptions for the available market scenarios, and in 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation.

The USD/NOK exchange rate used for the purposes of the impairment tests is a cross rate calculated based on forward curves for the EUR/USD and EUR/NOK currency pairs.

Due to significant market volatility, in particular with respect to oil and gas prices, the adopted assumptions may be subject to justifiable changes, and such changes may necessitate a revision of the carrying amounts of the LOTOS E&P Norge's assets in the future.

To determine the effect of key factors on the test results, the Group carried out an analysis of sensitivity to a -15%/+15% change in oil and gas prices, -15%/+15% change in production volumes, and -15%/+15% change in the USD/NOK exchange rate.

The table below presents the estimated changes in potential impairment losses on the tested Heimdal and Sleipner assets following changes in the key assumptions:

Factor	Change	Impact on impairment losses PLN '000	
Crude oil and gas prices	+/- 15%	22,626	- 14,858
Production volume	+/- 15%	22,009	- 13,806
USD/NOK exchange rate	+/- 15%	22,549	- 14,729
Discount rate	+/- 0,5 pp	-	12,895

Impairment testing of onshore oil and gas extraction facilities in Lithuania

As a result of impairment tests performed for the resources and production infrastructure in Lithuania, as at December 31st 2016 the Group recognised an impairment loss of PLN 119 thousand on production assets associated with the Kretinga field, and an impairment loss of PLN 12,318 thousand on property, plant and equipment comprising production infrastructure associated with the Auksoras, Vėžaičiai, Kretinga, Ablinga and Liūiai fields; see [Note 9.4](#).

Following impairment tests as at December 31st 2015 an impairment loss totalling PLN 52,419 thousand was recognised on production assets associated with the Kretinga, Nausodis, Girkalai, Vėžaičiai and Liūiai fields; another impairment loss, of PLN 6,314 thousand, was recognised on the property, plant and equipment comprising production infrastructure of the Ablinga and Liūiai fields; see [Note 9.4](#).

The Group determines the recoverable amount of the tested assets as their value in use measured using the discounted future cash flows method.

Key assumptions underlying computation of the recoverable amount of the tested assets in Lithuania:

- the cash flow projection period was assumed to equal the asset's planned life,

- the discount rate was assumed to equal the weighted average cost, at 9.0% (2015: 10.1%),
- production volumes were assumed to be in line with a competent person report prepared by Miller & Lents based on available current geological information,
- capital expenditure was assumed to match the projected production volumes.

The following crude oil price assumptions (USD/bbl) were adopted for the purposes of the estimates made in 2016:

- 2017–2022 – prices in line with the price assumptions for the available market scenarios,
- 2023 and beyond – prices remaining stable in the long term on par with the 2022 level, adjusted for inflation.

Crude oil price assumptions (USD/bbl) adopted for the purposes of the estimates as at December 31st 2015:

- 2016–2019 – prices in line with the price assumptions for the available market scenarios,
- 2020 and beyond – prices remaining stable in the long term on par with the 2019 level, adjusted for inflation.

Due to significant market volatility, in particular with respect to crude oil prices, the adopted assumptions may be subject to justifiable changes, and such changes may necessitate a revision of the carrying amounts of the assets in the future.

To determine the effect of key factors on the test results, the Group carried out an analysis of sensitivity to a -15%/+15% change in oil prices, -15%/+15% change in production volumes, -15%/+15% change in the USD/EUR exchange rate, and -0.5%/+0.5% change in the discount rate.

The table below presents the estimated changes in impairment losses on the Lithuanian assets referred to above following changes in the key assumptions:

Factor	Change	Impact on impairment losses PLN '000	
Crude oil and gas prices	+/- 15%	28,796	-41,861
Production volume	+/- 15%	22,631	-33,810
USD/EUR exchange rate	+/- 15%	17,532	-30,960
Discount rate	+/- 0,5 pp	-7 601	-

Assets related to future costs of decommissioning of oil and gas extraction facilities

As part of its development and production assets, the Group discloses assets related to future costs of decommissioning of oil and gas extraction facilities depreciated with the units-of-production method. These assets are recognised along with the recognition and remeasurement of provisions for decommissioning of oil and gas extraction facilities.

	Development assets			Production assets				Total
	Poland	Norway	Total	Poland	Norway	Lithuania	Total	
Gross carrying amount Jan 12016	-	122,783	122,783	108,129	829,806	2,042	939,977	1,062,760
Estimated costs of decommissioning of oil and gas extraction facilities	-	-	-	(2,921)	(87,911)	(389)	(91,221)	(91,221)
Exchange differences on translating foreign operations	-	12,109	12,109	-	79,179	73	79,252	91,361
Reclassification to production assets	-	-	-	2,223 ⁽¹⁾	-	-	2,223	2,223

Gross carrying amount Dec 31 2016	-	134,892	134,892	107,431	821,074	1,726	930,231	1,065,123
Accumulated depreciation and amortisation Jan 12 016	-	-	-	76,568	124,010	1,341	201,919	201,919
Depreciation and amortisation	-	-	-	1,339	261,606	185	263,130	263,130
Exchange differences on translating foreign operations	-	-	-	-	20,148	53	20,201	20,201
Reclassification to production assets	-	-	-	2,223 ⁽¹⁾	-	-	2,223	2,223
Accumulated depreciation and amortisation Dec 31 2016	-	-	-	80,130	405,764	1,579	487,473	487,473
Impairment losses Jan 12 016	-	122,783	122,783	-	32,029	-	32,029	154,812
Recognised	-	-	-	-	-	-	-	-
Exchange differences on translating foreign operations	-	12,109	12,109	-	3,100	-	3,100	15,209
Used/Reversed	-	-	-	-	(1,950)	-	(1,950)	(1,950)
Impairment losses Dec 31 2016	-	134,892	134,892	-	33,179	-	33,179	168,071
Net carrying amount Dec 31 2016	-	-	-	27,301	382,131	147	409,579	409,579

⁽¹⁾ Offshore gas pipeline from the B-3 field.

	Development assets			Production assets				Total
	Poland	Norway	Total	Poland	Norway	Lithuania	Total	
Gross carrying amount Jan 12 015	28,571	129,699	158,270	72,558	266,534	2,298	341,390	499,660
Recognised	-	-	-	-	605,423 ⁽²⁾	-	605,423	605,423
Estimated costs of decommissioning of oil and gas extraction facilities	10,054	1,485	11,539	(304)	5,480	(250)	4,926	16,465
Exchange differences on translating foreign operations	-	(8,401)	(8,401)	-	(47,631)	(6)	(47,637)	(56,038)
Reversal of assets related to decommissioning of oil and gas extraction facilities	(2,750)	-	(2,750)	-	-	-	-	(2,750)
Reclassification of development assets to production assets	(35,875) ⁽¹⁾	-	(35,875)	35,875 ⁽¹⁾	-	-	35,875	-
Gross carrying amount Dec 31 2015	-	122,783	122,783	108,129	829,806	2,042	939,977	1,062,760
Accumulated depreciation and amortisation Jan 12 015	3,998	-	3,998	72,217	90,069	942	163,228	167,226

Depreciation and amortisation	316	-	316	37	41,810	393	42,240	42,556
Exchange differences on translating foreign operations	-	-	-	-	(7,869)	6	(7,863)	(7,863)
Reclassification of development assets to production assets	(4,314) ⁽¹⁾	-	(4,314)	4,314 ⁽¹⁾	-	-	4,314	-
Accumulated depreciation and amortisation Dec 31 2015	-	-	-	76,568	124,010	1,341	201,919	201,919
Impairment losses Jan 12 015	-	129,699	129,699	-	-	-	-	129,699
Recognised	-	1,485	1,485	-	-	-	-	1,485
Exchange differences on translating foreign operations	-	(8,401)	(8,401)	-	(1,684)	-	(1,684)	(10,085)
Used/Reversed	-	-	-	-	33,713	-	33,713	33,713
Impairment losses Dec 31 2015	-	122,783	122,783	-	32,029	-	32,029	154,812
Net carrying amount Dec 31 2015	-	-	-	31,561	673,767	701	706,029	706,029

⁽¹⁾ Reclassification of expenditure following production launch in the B-8 field.

⁽²⁾ Acquisition of Sleipner assets in Norway (for more information on the transaction, see [Note 13.1.3](#) to the *Consolidated financial statements for 2015*).

13.2.3 Other non-current assets of the upstream segment

	Land	Buildings, structures	Plant and equipment	Vehicles, other	Property, plant and equipment under construction	Intangible assets	Total
Gross carrying amount Jan 12 016	11,417	96,386	84,614	539,132	15,072	29,495	776,116
Purchase	-	-	255	11,644	12,295	187	24,381
Transfer from property, plant and equipment under construction	-	-	136	10,604	(10,740)	-	-
Exchange differences on translating foreign operations	-	66	775	12,806	29	1,721	15,397
Reclassification of refining and other assets to production assets	-	(42,408) ⁽¹⁾	(16,141) ⁽¹⁾	-	-	-	(58,549)
Disposal	-	(13)	(461)	(13,772)	-	(269)	(14,515)
Other	-	(885)	(33)	-	(1,381)	(2)	(2,301)
Gross carrying amount Dec 31 2016	11,417	53,146	69,145	560,414	15,275	31,132	740,529
Accumulated depreciation and amortisation Jan 12 016	3,863	34,391	45,535	235,098	-	16,650	335,537
Depreciation and amortisation	277	2,291	4,012	33,698	-	4,421	44,699
Exchange differences on translating foreign operations	-	16	555	11,209	-	886	12,666

Reclassification of refining and other assets to production assets	-	(16,464) ⁽¹⁾	(10,597) ⁽¹⁾	-	-	-	(27,061)
Disposal	-	(12)	(356)	(7,235)	-	(269)	(7,872)
Other	-	(152)	(3)	-	-	(2)	(157)
Accumulated depreciation and amortisation Dec 31 2016	4,140	20,070	39,146	272,770	-	21,686	357,812
Impairment losses Jan 12016	-	-	562	5,343	120	-	6,025
Recognised	4	21	12	5,374 ⁽²⁾	-	-	5,411
Exchange differences on translating foreign operations	-	-	19	277	9	-	305
Used/Reversed	-	-	-	(5,875)	-	-	(5,875)
Impairment losses Dec 31 2016	4	21	593	5,119	129	-	5,866
Net carrying amount Dec 31 2016	7,273	33,055	29,406	282,525	15,146	9,446	376,851

⁽¹⁾ Offshore gas pipeline from the B-3 field.

⁽²⁾ Including ships valued at PLN 5,333 thousand, see [Note 9.4](#).

	Land	Buildings, structures	Plant and equipment	Vehicles, other	Property, plant and equipment under construction	Intangible assets	Total
Gross carrying amount Jan 12015	11,417	98,072	79,528	493,182	108,236	30,542	820,977
Purchase	-	-	1,287	252	30,466	136	32,141
Transfer from property, plant and equipment under construction	-	407	3,010	29,026	(32,443)	-	-
Exchange differences on translating foreign operations	-	2	987	17,178	93	(1,158)	17,102
Estimated costs of decommissioning, land reclamation and clean-up	-	(2,095)	(142)	-	-	-	(2,237)
Reclassification to development assets	-	-	-	-	(30,857) ⁽¹⁾	-	(30,857)
Reclassification to exploration and evaluation assets	-	-	-	-	(60,577) ⁽²⁾	-	(60,577)
Disposal	-	-	(43)	(506)	-	(22)	(571)
Other	-	-	(13)	-	154	(3)	138
Gross carrying amount Dec 31 2015	11,417	96,386	84,614	539,132	15,072	29,495	776,116
Accumulated depreciation and amortisation Jan 12015	3,586	29,375	40,114	182,528	-	12,584	268,187
Depreciation and amortisation	277	5,014	4,764	38,991	-	4,575	53,621
Exchange differences on translating foreign operations	-	2	707	14,080	-	(485)	14,304
Disposal	-	-	(37)	(501)	-	(21)	(559)
Other	-	-	(13)	-	-	(3)	(16)

Accumulated depreciation and amortisation Dec 31 2015	3,863	34,391	45,535	235,098	-	16,650	335,537
Impairment losses Jan 1 2015	-	-	300	1,098	-	-	1,398
Recognised	-	-	255 ⁽³⁾	4,127 ⁽³⁾	117 ⁽³⁾	-	4,499
Exchange differences on translating foreign operations	-	-	7	118	3	-	128
Used/Reversed	-	-	-	-	-	-	-
Impairment losses Dec 31 2015	-	-	562	5,343	120	-	6,025
Net carrying amount Dec 31 2015	7,554	61,995	38,517	298,691	14,952	12,845	434,554

⁽¹⁾ Related to prepayments for capital expenditure on the development of the B-8 field.

⁽²⁾ Related to operations on the Gaz Potudnie, Gotlandia, Łeba and Rozewie licence areas, which will be continued in 2016 in line with the upstream segment management's decision. Applications were filed to convert the Łeba and Rozewie licences into combined oil and gas exploration, appraisal and production licences.

⁽³⁾ Ships.

Other property, plant and equipment and intangible assets of the upstream segment include ships and a multi-purpose mobile drilling rig.

13.3 Other information on property, plant and equipment and intangible assets

	Property, plant and equipment used under finance lease	
	Dec 31 2016	Dec 31 2015
Gross carrying amount	312,277	334,209
Accumulated depreciation and amortisation	103,644	93,403
Impairment losses	800	-
Net carrying amount	207,833	240,806

The Group uses finance leases to finance primarily rolling stock assets (downstream segment); see also [Note 23.4](#).

Allocation of depreciation and amortisation	2016	2015
Cost of sales	936,303	611,832
Distribution costs	87,474	68,769
Administrative expenses	35,628	38,722
Change in products and adjustments to cost of sales	8,489	(4,755)
Total	1,067,894	714,568

In 2016, the Group capitalised finance costs of PLN 4,840 thousand as property, plant and equipment under construction and intangible assets under development (2015: PLN 1,383 thousand) (see [Note 13.1.1](#) and [13.1.3](#)). As at December 31st 2016,

financing costs capitalised as property, plant and equipment under construction and intangible assets under development totalled PLN 13,084 thousand (December 31st 2015: PLN 5,164 thousand).

As at December 31st 2016, property, plant and equipment and intangible assets serving as collateral for the Group's liabilities were PLN 6,232,650 thousand (December 31st 2015: PLN 6,538,480 thousand).

As at December 31st 2016, the Group's future contractual commitments for expenditure on property, plant and equipment and intangible assets not disclosed in the statement of financial position amounted to PLN 1,366,651 thousand and were chiefly related to the construction of the delayed coking unit (DCU) (the EFRA Project), development of the B-8 field (B8 Project), construction of a hydrogen recovery unit (HRU) at the refinery, and expansion of the service station chain (December 31st 2015: PLN 1,773,814 thousand).

The Notes to the consolidated financial statements are an integral part of the statements.
(This is a translation of a document originally issued in Polish)