28. Objectives and policies of financial risk management

The Group is exposed to financial risks, including:

- market risk (risk related to prices of raw materials and petroleum products, risk related to prices of CO_2 allowances, currency risk, interest rate risk),
- liquidity risk,
- credit risk related to financial and trade transactions.

The Parent operates a Financial Risk Management Office, which coordinates and exercises ongoing supervision of the Group's financial risk management processes.

Furthermore, the Price Risk and Trading Committee, appointed by the Management Board, supervises the work on development of policies and procedures, and monitors implementation of the Group's strategy in the area of its responsibilities. Specifically, the Committee provides opinions on or initiates key price and trading risk management projects, makes recommendations, and submits proposals for actions that require the Management Board's approval.

In addition, to ensure effective management of liquidity, debt structure and external finance raising by companies of the LOTOS Group, the Management Board has appointed the Liquidity Optimisation and Financing Coordination Team.

Financial risk management seeks to achieve the following key objectives:

- increase the probability of budget and strategic objectives being met,
- limit cash flow volatility,
- ensure short-term financial liquidity,
- optimise the expected level of cash flows and risk,
- support operating, investment and financial processes, and create value in the long term.

With a view to implementing the above objectives, the Group has put in place relevant tools and developed a number of documents, approved at the relevant decision-making levels, defining the framework for ensuring effectiveness and safety of the Group's financial activities, including:

- the methodology for quantifying exposures to particular risks,
- the time horizon for hedging a given risk,
- acceptable financial instruments,
- the method of assessing financial risk management,
- limits within risk management,
- the reporting method,
- credit limits,
- documentation and operating standards,

- division of responsibilities for execution of transactions, risk analysis and control, as well as documentation of and accounting for transactions, among various corporate units.

The Parent monitors and reports all managed market risks on an ongoing basis. Grupa LOTOS S.A. uses liquid derivatives which can be measured by applying commonly used valuation models. Valuation of derivative financial instruments is performed based on market inputs provided by reliable sources. Opening positions with respect to risks which do not arise as part of the Group's core business is prohibited.

In 2016, the Parent continued to apply the hedge accounting policies implemented in 2011 and 2012 with respect to its cash flows (i.e. foreign-currency facilities used to finance the 10+ Programme, designated as hedges of future USD-denominated petroleum product sale transactions).

28.1 Risk related to raw material and petroleum product prices

The Group considers risk related to prices of raw materials and petroleum products to be particularly important.

The following risk factors are identified in this area:

- volatility of the refining margin, measured as the difference between liquid indices of a reference petroleum product basket (e.g. aviation fuel, gasoline, diesel oil, fuel oil) and a liquid index of a reference raw material (e.g. Urals crude),
- volatility of prices with respect to the raw material and product inventory volumes deviating from the required levels of emergency and operational stocks,
- volatility of differentials between the reference indices and indices used in commercial contracts (e.g. Urals-Brent differential, i.e. the difference between different types of crude oil),
- use of non-standard pricing formulae in commercial contracts.

On February 16th 2015, the Parent's Management Board approved the "rupa LOTOS S.A.'s raw material and petroleum products price risk management policy, which introduced the classification system for transaction portfolios, defined their business functions, described how risk is understood and how portfolio exposures are set, specified permitted financial instruments, limitations on their use, and transaction execution standards, and also provided guidelines on how to evaluate risk management performance and set relevant limits. Transaction limits falling within the scope of that policy are delegated by the Management Board to lower-level decision-makers.

To support the achievement of the policy objectives, the Company uses a leading ETRM system available on the market.

Under the approved policy, the Company may continue to offer its customers petroleum products at fixed prices. The transactions executed in 2016 covered bitumen components. To preserve the original price risk profile the Group entered into commodity swaps.

Acting within the framework of its approved policy, in order to take advantage of the contango environment on the futures market, improve the operating margin and get prepared for the maintenance shutdown in 2017, the Company entered into commodity swaps based on the ULSD 10 ppm CIF NWE index and purchased additional volumes of diesel oil (carried as inventory).

Open commodity swaps as at December 31st 2016

				Fair value	
Type of contract	Underlying index	Valuation period	Amount in tonnes in the valuation period	Financial assets	Financial liabilities
Commodity swap	3.5 PCT Barges FOB Rotterdam	Mar 2017-Nov 2018	181,526	58,532	(4,791)
Commodity swap	Gasoil 0.1 pct Crg CIF NWE_ARA	Mar 2017-Nov 2018	(16,201)	202	(6,649)
Commodity swap	ULSD 10 ppm CIF NWE	Apr 2017	(16,050)	-	(6,962)

			Total	58,734	(18,402)

The above swap transactions for a total of 181,526 tonnes based on the 3.5 PCT Barges FOB Rotterdam liquid index in the period from March 2017 to November 2018 and (16,201) tonnes based on the Gasoil 0.1 pct Crg CIF NWE ARA liquid index in the period from March 2017 to November 2018 were entered into to reverse the risk profile relating to the prices of raw materials and petroleum products in connection with sales of bitumen components at fixed prices. The swap transaction for (16,050) tonnes based on the ULSD 10 ppm CIF NWE index in April 2017 was entered into to benefit from contango.

Open commodity swaps as at December 31st 2015

				Fair value	
Type of contract	Underlying index	Valuation period	Amount in tonnes in the valuation period	Financial assets	Financial liabilities
Commodity swap	3.5 PCT Barges FOB Rotterdam	Mar 2016-Nov 2017	92,845	22	(58,042)
Commodity swap	Gasoil 0.1 pct Crg CIF NWE_ARA	May 2016-Nov 2017	(2,603)	839	(13)
Commodity swap	Brent (Dtd)	Mar 2016-May 2016	(249,931)	197,730	-
			Total	**198,591**	**(58,055)**

The above swaps for a total of 92,845 tonnes based on the 3.5 PCT Barges FOB Rotterdam liquid index in the period from March 2016 to November 2017 were entered into to reverse the risk profile relating to the prices of raw materials and petroleum products in connection with sales of bitumen components at fixed prices. The swap transactions for a total of (249,931) tonnes based on the Brent (Dtd) index in the period from March to May 2016 were entered into tp benefit from contango.

Open commodity options as at December 31st 2016

				Fair value	
Type of contract	Underlying index	Valuation period	Amount in tonnes in the valuation period	Financial assets	Financial liabilities
Commodity options	3.5 PCT Barges FOB Rotterdam	Mar 2017-Oct 2018	10,646	411	-

The above options for a total of 10,646 tonnes based on the 3.5 PCT Barges FOB Rotterdam liquid index in the period from March 2017 to October 2017 were entered into to reverse the risk profile relating to the prices of raw materials and petroleum products in connection with sales of bitumen components at fixed prices.

Open commodity options as at December 31st 2015

				Fair value	
Type of contract	Underlying index	Valuation period	Amount in tonnes in the valuation period	Financial assets	Financial liabilities
Commodity options	3.5 PCT Barges FOB Rotterdam	Mar 2016-Oct 2017	27,105	363	-

The above options for a total of 27,105 tonnes based on the 3.5 PCT Barges FOB Rotterdam liquid index in the period from March 2016 to October 2017 were entered into to reverse the risk profile relating to the prices of raw materials and petroleum products in connection with sales of bitumen components at fixed prices.

28.1.1 Sensitivity analysis: market risk related to raw material and petroleum product price movements

Below is presented an analysis of the sensitivity of the Group's financial transactions to the risk of fluctuations in prices of raw materials and petroleum products as at December 31st 2016 and December 31st 2015, assuming price increase/decrease corresponding to the implied annual volatility of the underlying index.

	Dec 31 2016			Dec 31 2015		
		Change*		Carrying	Change**	
	Carrying amount	+ implied volatility	- implied volatility	amount	+imp. vol.	-imp. vol.
Financial assets (1)	59,145	75,061	(72,911)	198,954	(93,473)	95,080
Financial liabilities (1)	(18,402)	(4,631)	4,631	(58,055)	27,125	(27,131)
Total	**40,743**	**70,430**	**(68,280)**	**140,899**	**(66,348)**	**67,949**

(1) Total commodity swaps and options.
* With respect to instruments held as at December 31st 2016, the above deviations of underlying index prices were calculated based on the implied annual volatility of the underlying index for December 31st 2016, as published by SuperDerivatives. The volatility was +/- 34.85% for the 3.5 PCT Barges FOB Rotterdam index, +/- 27.44 for the Gasoil 0.1 pct Crg CIF NWE_ARA index, and +/- 29.18% for the Brent (Dtd) index.
** With respect to instruments held as at December 31st 2015, the above deviations of underlying index prices were calculated based on the implied annual volatility of the underlying index for December 31st 2015, as published on the SuperDerivatives website. The volatility was +/- 43.48% for the 3.5 PCT Barges FOB Rotterdam index, +/- 32.9% for the Gasoil 0.1 pct Crg CIF NWE_ARA index, and +/- 35.65% for the Brent (Dtd) index.

The effect of the underlying index price changes on the fair value was examined assuming that the currency exchange rates remain unchanged.

28.2 Risk related to prices of carbon (CO_2) allowances

The risk related to prices of carbon dioxide emissions allowances is managed by the Parent on an ongoing basis in line with the assumptions set forth in the strategy for managing the risk related to prices of carbon dioxide (CO_2), approved by the Grupa LOTOS Management Board. The Group balances its future CO_2 emission allowance deficits and surpluses depending on the market situation and within defined limits. In line with the approved strategy and limits, the Parent executes the following transactions for emission units:

- EUA (Emission Unit Allowance) – representing an allowance to emit one tonne of CO_2,
- CER (Certified Emission Reduction unit) – representing one tonne of CO_2 equivalent (tCO_2e) effectively reduced; CERs are obtained in connection with investment projects implemented in developing countries where no CO_2 emission limits have been defined,
- ERU (Emission Reduction Unit) – representing one tonne of CO_2 equivalent (tCO_2e) effectively reduced; ERUs are certified emission units obtained through investment projects implemented in countries where the CO_2 reduction costs are lower.

As at December 31st 2016, the Parent's deficit of allowances in the 2013–2020 trading period (Phase III) was 1,231,057 tonnes. However, taking into account derivative transactions for a total of 1,752,000 tonnes, the Parent had surplus emission allowances for 520,943 tonnes, which were purchased in view of the market situation and the strategic nature of the emission allowances deficit expected after 2020.

As at December 31st 2015, the Parent's deficit of allowances in the 2013–2020 trading period (Phase III) was 1,095,003 tonnes. Taking into account derivative transactions for a total of 1,715,000 tonnes, the Parent had surplus emission allowances for

619,997 tonnes, purchased in view of the market situation and the anticipated strategic deficit in emission allowances after 2020.

To manage risk related to carbon dioxide emission allowances, the Group evaluates the risk of deficit of free emission allowances allocated under the National Allocation Plan on a case-by-case basis.

The CO_2 emission allowances for 2013-2020 presented below include allowances granted pursuant to the Regulations of the Polish Council of Ministers, as well as other free allowances allocated by the European Commission.

Number of free CO_2 emission allowances for 2013-2020 and actual CO_2 emissions:

'000 tonnes	2013	2014	2015	2016	2017	2018	2019	2020	Total
Allowances allocated under the National Allocation Plan (1)	1,766	1,688	1,652	1,613	1,576	1,540	1,505	1,461	12,801
Actual CO_2 emissions (2)	1,745	1,875	1,947	1,956	-	-	-	-	7,523

(1) Number of free CO_2 allowances in 2013–2020 as per the National Allocation Plan (NAP), based on the Regulation of the Polish Council of Ministers of March 31st 2014 (Dz.U. of 2014, item 439) and the Regulation of the Polish Council of Ministers of April 8th 2014 (Dz.U. of 2014, item 472), containing a list of installations covered by the greenhouse gas emission allowance trading scheme along with the number of allowances allocated to them. The figures also account for additional free emission allowances from the European Commission reserve, allocated in connection with the expansion of the refinery's production capacities following from the use of natural gas in hydrogen production.
(2) (CO_2) emissions, calculated based on the production data for the installations covered by the emission trading scheme. The data for 2016 was verified in accordance with Art. 59 of the Act on Trading in Greenhouse Gas Emission Allowances of April 28th 2011.

As at December 31st 2016, considering the proposed amount of allowances to be allocated under the European Union Emissions Trading Scheme for 2016 and the actual volume of emissions, the Group reported a deficit of allocated CO_2 emission allowances, and therefore recognised a PLN 9,790 thousand provision as at December 31st 2016 (December 31st 2015: PLN 1,059 thousand). The PLN 8,731 thousand effect of the provision on EBIT (see Note 9.3) is presented under other expenses (2015: PLN 1,059 thousand; see Note 9.4).

If required, futures contracts to purchase carbon (CO_2) allowances open as at the last day of the reporting period are settled by the Group through physical delivery, with the intention to potentially use the allowances to offset the Group's actual CO_2 emissions. The valuation of contracts settled through physical delivery is not disclosed under financial assets/liabilities in the financial statements. However, the Group internally monitors and performs the valuation of such contracts as part of an overall assessment of the effectiveness of its CO_2 risk management (off balance sheet).

EUA futures contracts open as at December 31st 2015 which the Group considered likely to be settled through physical delivery and used for the Group's own purposes were not disclosed in the financial statements as at the last day of the reporting period, and their fair value was recorded only as an off-balance sheet item.

Contract position as at December 31st 2016 and 2015:

Open CO_2 allowances contracts as at December 31st 2016:

				Fair value*	
Type of contract	Contract settlement period	Number of allowances in the period	Phase	Financial assets	Financial liabilities
EUA Futures	Dec 2017–Dec 2019	1,752,000	Phase III	5,639	(5,255)

* Off-balance-sheet value, used exclusively for statistical purposes and as part of monitoring in risk management.

Open CO_2 allowances contracts as at December 31st 2015:

				Fair value*	
Type of contract	Contract settlement period	Number of allowances in the period	Phase	Financial assets	Financial liabilities
EUA Futures	Dec 2016–Dec 2019	1,715,000	Phase III	5,857	(191)

* Off-balance-sheet value, used exclusively for statistical purposes and as part of monitoring in risk management.

28.2.1 Sensitivity analysis: market risk related to movements in prices of carbon dioxide (CO_2) emission allowances

As at December 31st 2016 and December 31st 2015, the Group held futures for the purchase of carbon dioxide (CO_2) emission allowances.

The Group does not perform a sensitivity analysis for the fair value of futures contracts to purchase CO_2 emission allowances held by it as at the end of the reporting period if it intends to settle the contracts through physical delivery and use them to cover its own allowance deficits under the carbon emission reduction system. Therefore, no sensitivity analysis was performed with reference to the EUA futures held as at December 31st 2016 and 2015.

28.3 Currency risk

In its operations the Group is exposed to currency risks related to:

- trading in raw materials and petroleum products and other merchandise,
- investment cash flows,
- cash flows from financing activities, including deposits and borrowings,
- valuation of derivative instruments,

indexed to or denominated in a currency other than the Group's functional currency.

Since August 20th 2015, currency risk has been managed in line with the assumptions stipulated in the Grupa LOTOS S.A.'s currency risk management policy. Under the new policy, exposure is understood as material positions exposed to currency risk and affecting the liquidity in the management horizon in accordance with the scheduled payment dates. The central risk metric is Cash-Flow-at-Risk (CFaR), computed based on the CorporateMetrics™ methodology, with the CFaR value limit and the maximum hedge ratio being the key limits.

The exposure management horizon is linked with the budget forecast horizon, which varies from three to five consecutive quarters depending on the time of the year.

The Group actively manages its currency exposure by optimising the expected values of cash flows and risk within applicable limits, taking into account expected market developments.

As USD is used in market price quotations for crude oil and petroleum products, it was decided that it is the most appropriate currency for contracting and repaying long-term credit facilities to finance the 10+ Programme, as this would reduce the structural long position, and consequently also the strategic currency risk.

The Group has a structural long position in USD (it benefits from a rise in the USD/PLN exchange rate) as its cash inflows dependent on the USD exchange rate (mainly revenue from sale of petroleum products) are higher than the corresponding cash outflows (e.g. on purchase of crude oil, credit facility repayments).

Under the EFRA Project, the Group concluded EUR/USD currency contracts designed to hedge EUR-denominated capital expenditure against USD as the main financing currency.

Open currency contracts as at December 31st 2016

Type of contract	Purchase/sale	Contract settlement period	Currency pair (base/quote)	Amount in base currency	Fair value	
					Financial assets	Financial liabilities
Currency forward	Purchase	Jan-Mar 2017	USD/PLN	53,000	8,618	(581)
Currency forward	Purchase	Jan 2017–Jun 2018	EUR/USD	215,200	-	(27,741)
Currency forward	Sale	Apr–Oct 2017	USD/PLN	(230,000)	-	(73,284)
Currency forward	Sale	Jan 2017	EUR/PLN	(4,600)	49	(36)
Currency swap	Purchase	Dec 2017	USD/PLN	70,000	26,157	-
Currency swap	Purchase	Jan 2017	EUR/USD	2,000	113	-
Currency swap	Sale	Jan-Dec 2017	USD/PLN	(267,064)	3,017	(33,240)
Currency swap	Sale	Jan 2017-Jul 2017	EUR/PLN	(19,054)	55	(825)
				Total	**38,009**	**(135,707)**

Open currency contracts as at December 31st 2015

Type of contract	Purchase/sale	Contract settlement period	Currency pair (base/quote)	Amount in base currency	Fair value	
					Financial assets	Financial liabilities
Currency spot	Purchase	Jan 2016	USD/PLN	13,000	227	-
Currency spot	Purchase	Jan 2016	EUR/PLN	500	-	-
Currency forward	Purchase	Oct 2016–Jun 2018	EUR/USD	186,700	8,663	(6)
Currency forward	Sale	Jan–Sep 2016	USD/PLN	(128,000)	5,192	(903)
Currency swap	Purchase	Feb 2016	USD/PLN	100,000	2,088	-
Currency swap	Sale	Jan–Jul 2016	USD/PLN	(362,000)	1,063	(33,924)
				Total	**17,233**	**(34,833)**

28.3.1 Sensitivity analysis: market risk related to currency exchange movements

Currency structure of selected financial instruments as at December 31st 2016

Dec 31 2016 (PLN '000)	Note	USD '000	USD translated into PLN	EUR '000	EUR translated into PLN	Carrying amount in foreign currency translated into PLN
Classes of financial instruments						
Financial assets						
Trade receivables		86,971	363,485	5,141	22,743	386,228

Cash and cash equivalents		12,964	54,191	10,637	47,059	101,250
Derivative financial instruments		-	-	-	-	-
Notes		85,542	357,504	-	-	357,504
Other financial assets:		178,922	749,403	9,122	40,355	789,758
Loans advanced to related entities		152,687	639,458	4,654	20,589	660,047
Deposits		7,564	31,612	-	-	31,612
Security deposit (margin)		-	-	4,467	19,763	19,763
Cash for removal of the MOPU from the YME field	16	17,941	75,284	-	-	75,284
Other		730	3,049	1	3	3,052
Total		**364,399**	**1,524,583**	**24,900**	**110,157**	**1,634,740**
Financial liabilities						
Borrowings		1,284,740	5,325,141	-	1	5,325,142
Notes		136,526	571,965	-	-	571,965
Finance lease liabilities		-	-	13,473	59,603	59,603
Trade payables		281,376	1,175,952	12,916	57,132	1,233,084
Other financial liabilities		4,706	19,710	17,815	78,750	98,460
Total		**1,707,348**	**7,092,768**	**44,204**	**195,486**	**7,288,254**

Currency structure of selected financial instruments as at December 31st 2015

Dec 31 2015 (PLN '000)	Note	USD '000	USD translated into PLN	EUR '000	EUR translated into PLN	Carrying amount in foreign currency translated into PLN
Classes of financial instruments						
Financial assets						
Trade receivables		61,664	240,553	5,917	25,043	265,596
Cash and cash equivalents		33,184	129,511	16,415	69,957	199,468
Notes		71,567	279,191	-	-	279,191
Other financial assets:		250,322	976,577	43,791	186,604	1,163,181
Loans advanced to related entities		200,776	783,232	-	-	783,232
Deposits		7,750	30,238	42,934	182,965	213,203
Security deposit (margin)		-	-	745	3,176	3,176

Cash for removal of the MOPU from the YME field	16	27,808	108,540	-	-	108,540
Other		13,988	54,567	112	463	55,030
Total		**416,737**	**1,625,832**	**66,123**	**281,604**	**1,907,436**
Financial liabilities						
Borrowings		1,601,594	6,268,236	2,257	9,620	6,277,856
Notes		127,465	497,410	-	-	497,410
Finance lease liabilities		-	-	16,170	68,907	68,907
Trade payables		208,414	813,054	7,855	34,100	847,154
Other financial liabilities		6,915	26,368	9,472	40,364	66,732
Total		**1,944,388**	**7,605,068**	**35,754**	**152,991**	**7,758,059**

For the purposes of sensitivity analysis, the currency structure presented above also accounts for intercompany foreign currency transactions sensitive to changes in foreign exchange rates, which affect the Group's currency risk in accordance with IAS 21 *The Effects of Changes in Foreign Exchange* Rates with respect to recognition of relevant foreign exchange gains or losses in the Group's net profit or loss.

Apart from currency spots, forwards and swaps, the Group held foreign-currency derivatives, including commodity swaps, commodity options, interest-rate swaps and futures. Depending on the type of derivative, the Group applies the appropriate method of fair value measurement, which also determines the method of calculating the effect of changes of foreign exchange rates on the value of individual derivatives (for more detailed information on the derivative measurement methods, see Note 7.24). The tables below, presenting sensitivity of financial instruments to currency risk as at December 31st 2016 and December 31st 2015, also present the effect of currency rate movements on the carrying amounts of the derivative financial instruments.

Analysis of the sensitivity to currency risk as at December 31st 2016, showing the effect of a +/- 12.9% change in the USD/PLN exchange rate and a +/- 7.375% change in the EUR/PLN exchange rate on net profit or loss

	Effect of exchange rate increase/decrease on profit/loss for the year			
	+12.9%	**+7.375%**	**-12.9%**	**-7.375%**
Dec 31 2016	**USD**	**EUR**	**USD**	**EUR**
Classes of financial instruments				
Financial assets				
Derivative financial instruments	15,761	(1,729)	(15,374)	1,729
Trade receivables	46,890	1,677	(46,890)	(1,677)
Cash and cash equivalents	6,991	3,471	(6,991)	(3,471)
Notes	46,118	-	(46,118)	-
Other financial assets:	96,673	2,976	(96,673)	(2,976)
Loans advanced to related entities	82,490	1,518	(82,490)	(1,518)
Deposits	4,078	-	(4,078)	-

Security deposits (margins)	-	1,458	-	(1,458)
Cash for removal of the MOPU from the YME field	9,712	-	(9,712)	-
Other	393	-	(393)	-
Total financial assets	**212,433**	**6,395**	**(212,046)**	**(6,395)**
Financial liabilities				
Borrowings	202,245 [1]	-	(202,245) [1]	-
Notes	73,783	-	(73,783)	-
Finance lease liabilities	-	4,396	-	(4,396)
Derivative financial instruments	345,801	(65,050)	(345,801)	65,050
Trade payables	151,698	4,213	(151,698)	(4,213)
Other financial liabilities	2,543	5,808	(2,543)	(5,808)
Total financial liabilities	**776,070**	**(50,633)**	**(776,070)**	**50,633**
Total	**(563,637)**	**57,028**	**564,024**	**(57,028)**

[1] The calculation of the effect of an exchange rate movement on the balance-sheet item takes into account the effect of cash flow hedge accounting. Assuming a +/- 12.9% change in the USD/PLN exchange rate, the effect of cash flow hedge accounting would potentially lead to a change of PLN (489,521) thousand/PLN 489,521 thousand in the fair value of borrowings. Furthermore, the calculation takes into account the effect of paid front-end arrangement fees (measured at the exchange rate effective on the payment date), reducing financial liabilities under borrowings, which would potentially result in a change of PLN 4,823 thousand/PLN (4,823) thousand in the fair value of borrowings, assuming a +/- 12.9% change in the USD/PLN exchange rate.

The above deviations of carrying amounts in the złoty that are dependent on currency exchange rates were calculated on the basis of the implied annual exchange rate volatility for December 31st 2016, which was 12.9% for USD/PLN and 7.375% for EUR/PLN, as published by Reuters. The sensitivity analysis was performed with reference to the balance of instruments held as at December 31st 2016.

Analysis of the sensitivity to currency risk as at December 31st 2015, showing the effect of a +/- 10.675% change in the USD/PLN exchange rate and a +/- 6.9% change in the EUR/PLN exchange rate on net profit or loss

	Effect of exchange rate increase/decrease on profit/loss for the year			
	+10.675%	**+6.9%**	**-10.675%**	**-6.9%**
Dec 31 2015	**USD**	**EUR**	**USD**	**EUR**
Classes of financial instruments				
Financial assets				
Derivative financial instruments	(58,908)	54,659	59,510	(54,659)
Trade receivables	25,679	1,728	(25,679)	(1,728)
Cash and cash equivalents	13,825	4,827	(13,825)	(4,827)
Notes	29,804	-	(29,804)	-

Other financial assets:	104,250	12,876	(104,250)	(12,876)
Loans advanced to related entities	83,610	-	(83,610)	-
Deposits	3,228	12,625	(3,228)	(12,625)
Security deposits (margins)	-	219	-	(219)
Cash for removal of the MOPU from the YME field	11,587	-	(11,587)	-
Other	5,825	32	(5,825)	(32)
Total financial assets	**114,650**	**74,090**	**(114,048)**	**(74,090)**
Financial liabilities				
Borrowings	177,753 [1]	664	(177,753) [1]	(664)
Notes	53,099	-	(53,099)	-
Finance lease liabilities	-	4,755	-	(4,755)
Derivative financial instruments	173,924	(305)	(173,918)	305
Trade payables	86,794	2,353	(86,794)	(2,353)
Other financial liabilities	2,815	2,785	(2,815)	(2,785)
Total financial liabilities	**494,385**	**10,252**	**(494,379)**	**(10,252)**
Total	**(379,735)**	**63,838**	**380,331**	**(63,838)**

[1] The calculation of the effect of an exchange rate movement on the balance-sheet item takes into account the effect of cash flow hedge accounting. Assuming a +/- 10.675% change in the USD/PLN exchange rate, the effect of cash flow hedge accounting would potentially lead to a change of PLN (434,990) thousand/PLN 434,990 thousand in the fair value of borrowings. Furthermore, the calculation takes into account the effect of paid front-end arrangement fees (measured at the exchange rate effective on the payment date), reducing financial liabilities under borrowings, which would potentially result in a change of PLN 4,968 thousand/PLN (4,968) thousand in the fair value of borrowings, assuming a +/- 10.675% change in the USD/PLN exchange rate.

The above deviations of carrying amounts in the złoty that are dependent on currency exchange rates were calculated on the basis of the implied annual exchange rate volatility for December 31st 2015, which was 10.675% for USD/PLN and 6.9% for EUR/PLN), as published by Reuters. The sensitivity analysis was performed with reference to the balance of instruments held as at December 31st 2015. The purpose of taking a different approach to calculating the percentage change in exchange rates in 2015 was to better reflect the fluctuations in exchange rates on financial markets.

28.4 Interest rate risk

The Parent is exposed to the risk of changes in cash flows caused by interest rate movements as interest income and interest expense related to certain assets and liabilities accrue based on floating interest rates, including in particular investment credit facilities under the 10+ Programme and the EFRA Project, as well as the financing and refinancing credit facility where the amount of interest is computed by reference to the floating LIBOR USD rate. The Parent manages the interest rate risk within the granted limits using interest rate swaps.

In a long-term perspective, a partial risk mitigation effect was achieved through the choice of the fixed interest rate for a tranche of the term facility contracted to finance the 10+ Programme.

Open interest rate contracts as at December 31st 2016

Type of contract	Period	Notional amount (USD '000)	Company receives	Financial assets	Financial liabilities

Interest rate swap (IRS)	Jul 2011-Jun 2019	212,500	6M LIBOR	82	(43,711)
Interest rate swap (IRS)	Jan 2015-Dec 2021	494,000	3M LIBOR	3,640	(11,416)
Total			**Total**	**3,722**	**(55,127)**

In the table above, IRS contracts are aggregated according to the currency of the notional amount and the reference rate. The "Period" column shows the earliest start date and the latest end date of the period for contracts classified in a given group.

Open interest rate contracts as at December 31st 2015

Type of contract	Period	Notional amount (USD '000)	Company receives	Financial assets	Financial liabilities
Interest rate swap (IRS)	Jul 2011-Jan 2018	200,000	6M LIBOR	-	(61,260)
Interest rate swap (IRS)	Jan 2015-Jan 2019	50,000	3M LIBOR	992	(11,003)
			Total	**992**	**(72,263)**

28.4.1 Sensitivity analysis: market risk related to interest rate movements

Analysis of the sensitivity to interest rate risk as at December 31st 2016, assuming a +/- 0.35% change in interest rates

			Change	
Dec 31 2016	**Note**	**Carrying amount**	**+0.35%**	**-0.35%**
Classes of financial instruments				
Financial assets				
Derivative financial instruments (1)	24	3,722	2,660	(2,700)
Cash and cash equivalents	18	744,616	2,606	(2,606)
Other financial assets:		509,256	1,782	(1,782)
Oil and Gas Extraction Facility Decommissioning Fund	16	33,195	116	(116)
Deposits	16	189,196	662	(662)
Security deposits (margins)	16	19,564	68	(68)
Cash securing contractual obligations related to future decommissioning of assets	16	192,017	672	(672)
Cash for removal of the MOPU from the YME field	16	75,284	264	(264)
Total		**1,257,594**	**7,048**	**(7,088)**
Financial liabilities				
Bank borrowings	23.1	5,082,926	14,512 (1)	(14,512) (1)
Non-bank borrowings	23.2	81,833	286	(286)

Notes	23.3	213,014	746	(746)
Finance lease liabilities	23.4	179,503	628	(628)
Derivative financial instruments [2]	24	55,127	(15,158)	15,401
Total		**5,612,403**	**1,014**	**(771)**

[1] Net of fixed-rate borrowings and paid arrangement fees reducing liabilities under borrowings.
[2] Interest rate swap (IRS). The difference between the change in the valuation amount when the interest rate curve moves up or down 0.35% arises at the time of calculating and discounting future cash flows (relating to the contract settlement) as at the valuation date. The cash flows are discounted at different interest rates (in the first case the interest rate curve movement increases the interest rate by 0.35%, in the second case reduces the interest rate by 0.35%).

Analysis of the sensitivity to interest rate risk as at December 31st 2015, assuming a +/- 1.14% change in interest rates

			Change	
Dec 31 2015	**Note**	**Carrying amount**	**+1.14%**	**-1.14%**
Classes of financial instruments				
Financial assets				
Derivative financial instruments [1]	24	992	(33,397)	36,285
Cash and cash equivalents	18	859,699	9,801	(9,801)
Other financial assets:		677,978	7,728	(7,728)
Oil and Gas Extraction Facility Decommissioning Fund	16	31,794	362	(362)
Deposits	16	85,519	975	(975)
Security deposits (margins)	16	3,176	36	(36)
Cash earmarked for the EFRA Project	16	438,329	4,997	(4,997)
Cash for removal of the MOPU from the YME field	16	108,540	1,237	(1,237)
Cash for other capital expenditure commitments	16	10,620	121	(121)
Total		**1,538,669**	**(15,868)**	**18,756**
Financial liabilities				
Bank borrowings	23.1	6,481,034	61,685 [1]	(61,685) [1]
Non-bank borrowings	23.2	92,146	1,050	(1,050)
Notes	23.3	218,100	2,486	(2,486)
Finance lease liabilities	23.4	208,028	2,372	(2,372)
Derivative financial instruments [2]	24	72,263	(25,352)	26,330
Total		**7,071,571**	**42,241**	**(41,263)**

[1] Net of fixed-rate borrowings and paid arrangement fees reducing liabilities under borrowings.

(2) Interest rate swap (IRS). The difference between the change in the valuation amount when the interest rate curve moves up or down 1.14% arises at the time of calculating and discounting future cash flows (relating to the contract settlement) as at the valuation date. The cash flows are discounted at different interest rates (in the first case the interest rate curve movement increases the interest rate by 1.14%, in the second case reduces the interest rate by 1.14%).

The sensitivity analysis was performed for the balance of instruments held as at December 31st 2016 and December 31st 2015. The effect of the interest rate changes on the fair value was examined assuming that the currency exchange rates remain unchanged. In the case of derivative instruments held as at December 31st 2016 and December 31st 2015, for the purpose of the interest rate sensitivity analysis the interest rate curve was moved up or down by the historical annual volatility for December 31st 2016 and December 31st 2015, calculated based on historical volatility data for interest rates on interest rate swaps expiring in two years and three years, respectively, as published by Reuters.

28.5 Liquidity risk

The liquidity risk management process at the Group consists in monitoring projected cash flows and the portfolio of financial assets and liabilities, matching maturities of the assets and liabilities, analysing working capital, and optimising cash flows within the Group. This process requires that units operating in different business areas closely cooperate in activities undertaken in order to ensure safe and effective allocation of the liquidity.

The majority of the Group's Polish subsidiaries participate in a real cash-pooling arrangement, whereby the Parent manages the structure on an on-going basis to optimise liquidity and interest balances.

In the period covered by the budget, liquidity is monitored on an ongoing basis across the Group as part of the financial risk management. In the mid- and long term, it is monitored as part of the planning process, which helps to develop a long-term financial strategy.

In the area of financial risk, in addition to active management of market risk, the Group observes the following liquidity management rules:

- no margins in derivative financial instrument trading on the OTC market,
- limited possibility of early termination of financial transactions,
- limits for low-liquidity spot financial instruments,
- credit limits for counterparties in financial and trade transactions,
- ensuring adequate quality and diversification of available financing sources,
- internal control processes and organisational efficiency facilitating prompt contingency response.

Contractual maturities of financial liabilities as at December 31st 2016 and December 31st 2015 are presented below.

Contractual maturities of financial liabilities

Dec 31 2016	Note	Carrying amount	Contractual cash flows	Up to 6 months	6-12 months	1-2 years	2-5 years	Over 5 years
Borrowings (other than overdraft facilities)	23.1	5,069,068	6,167,739	(305,473)	1,108,058	790,299	3,641,138	933,717
Overdraft facilities	23.1	13,858	13,858	13,858	-	-	-	-
Non-bank borrowings	23.2	81,833	83,153	6,257	6,534	11,895	56,014	2,453
Notes	23.3	213,014	213,080	79,770	133,310	-	-	-
Finance lease liabilities	23.4	179,503	235,835	28,759	29,012	56,728	116,991	4,345
Trade payables	26	1,718,178	1,718,178	1,718,178	-	-	-	-

Other financial liabilities	26	246,790	246,790	221,011	2,301	9,237	7,271	6,970
Total		**7,522,244**	**8,678,633**	**1,762,360**	**1,279,215**	**868,159**	**3,821,414**	**947,485**
Dec 31 2015								
Borrowings (other than overdraft facilities)	23.1	5,899,405	6,993,805	437,891	1,353,819	132,216	2,797,770	2,272,109
Overdraft facilities	23.1	581,629	581,629	581,629	-	-	-	-
Non-bank borrowings	23.2	92,146	106,994	7,698	7,687	15,586	42,838	33,185
Notes	23.3	218,100	218,100	-	218,100	-	-	-
Finance lease liabilities	23.4	208,028	287,491	25,901	28,747	57,162	141,546	34,135
Trade payables	26	1,232,510	1,232,510	1,232,494	16	-	-	-
Other financial liabilities	26	181,731	181,731	168,498	4,325	6,360	956	1,592
Total		**8,413,549**	**9,602,260**	**2,454,111**	**1,612,694**	**211,324**	**2,983,110**	**2,341,021**

Maturity structure of derivative financial instruments

Dec 31 2016	**Note**	**Carrying amount***	**Contractual cash flows**	**Up to 6 months**	**6-12 months**	**1-2 years**	**2-5 years**	**Over 5 years**
Commodity swap	24	40,332	40,842	(360)	25,918	15,284	-	-
Commodity options	24	411	411	58	353	-	-	-
Currency forward and spot contracts	24	(92,975)	(93,463)	(52,147)	(38,535)	(2,781)	-	-
Interest rate swap (IRS)	24	(51,405)	(51,878)	(30,542)	3,830	(19,452)	(5,714)	-
Currency swap	24	(4,723)	(4,545)	(23,938)	19,393	-	-	-
Total		**(108,360)**	**(108,633)**	**(106,929)**	**10,959**	**(6,949)**	**(5,714)**	**-**
Dec 31 2015								
Commodity swap	24	140,536	140,559	191,269	(42,405)	(8,305)	-	-
Commodity options	24	363	363	3	46	314	-	-
Currency forward and spot contracts	24	13,173	13,875	(629)	6,878	6,815	811	-
Interest rate swap (IRS)	24	(71,271)	(72,032)	(30,911)	3,946	(20,963)	(25,944)	1,840
Currency swap	24	(30,773)	(30,915)	(30,915)	-	-	-	-
Total		**52,028**	**51,850**	**128,817**	**(31,535)**	**(22,139)**	**(25,133)**	**1,840**

* Carrying amount (positive fair value of derivative financial instruments plus negative fair value of derivative financial instruments) represents the fair value of derivative financial instruments disclosed in the statement of financial position (excluding CO_2 emission allowance futures purchased with the intention of settlement through physical delivery).

28.6 Credit risk

Management of credit risk related to counterparties in financial transactions consists in the verification of creditworthiness of the current and potential counterparties and monitoring of the credit exposure against the granted limits. The credit exposure is attributable to bank deposits and derivatives measurement.

The counterparties must have an appropriate credit rating assigned by leading rating agencies or hold guarantees from institutions meeting the minimum rating requirement. The Group enters into financial transactions with reputable firms with sound credit standing, and diversifies the group of institutions with which it maintains relationships.

As at December 31st 2016 and December 31st 2015, the concentration of credit risk exposure to any single counterparty in financial transactions of the Group did not exceed PLN 575,847 thousand (8.15% of the Parent's equity) and PLN 839,799 thousand (13.95% of the Parent's equity), respectively.

As regards management of counterparty risk in non-financial transactions, all customers who request trading on credit terms are subject to credit assessment, whose results determine the level of possible credit limits. In 2016, the Parent completed development of a rating model which supports assigning credit limits to counterparties. The Parent defines guidelines for managing counterparty risk in non-financial transactions to ensure that appropriate standards of credit analysis and operational security are observed across the entire Group.

As at December 31st 2016 and December 31st 2015, the concentration of credit risk exposure to any single counterparty in trade transactions of the Group did not exceed PLN 238,895 thousand and PLN 163,009 thousand, respectively (or 3.38% and 2.71% of the Parent's equity, respectively).

Credit risk is measured by the maximum exposure to risk of individual classes of financial assets. Carrying amounts of financial assets represent the maximum credit risk exposure.

Maximum financial assets credit risk exposures	**Note**	**Dec 31 2016**	**Dec 31 2015**
Derivative financial instruments	24	100,876	217,179
Trade receivables	16	2,251,727	1,550,900
Cash and cash equivalents	18	744,616	859,699
Other financial assets	16	624,816	818,457
Total		**3,722,035**	**3,446,235**

In the Management Board's opinion, the risk related to non-performing financial assets is reflected in the recognised impairment losses. For information on impairment of financial assets, see Notes 9.4 and 16.1.

For information on concentrations of trade receivables credit risk, see Note 16.1.

For ageing analysis of unimpaired past due receivables, see Note 16.1.