19 Financial instruments - derivatives

Non-current assets and liabilities							
		31 December 17			31 December 16		
Underlying	**Fair Value Hierarchy**	**Notional**	**Fair Value Assets**	**Fair Value liabilities**	**Notional**	**Fair Value Assets**	**Fair Value liabilities**
Interest rate derivatives							
Loans	2	1,000 mn	60.8		1,000 mn	83.6	
Loans	2	571.7 mn		34.5	168.3 mn		44.1
Total interest rate derivatives			**60.8**	**34.5**		**83.6**	**44.1**
Exchange rate derivatives							
Loans	2	20 bn Jpy	5.3		20 bnJpy	25.9	
Total non-current derivatives			**66.1**	**34.5**		**109.5**	**44.1**

Current assets and liabilities							
		31 December 17			31 December 16		
Underlying	**Fair Value Hierarchy**	**Notional**	**Fair Value Assets**	**Fair Value liabilities**	**Notional**	**Fair Value Assets**	**Fair Value liabilities**
Commodity derivatives							
Foreign Gas Hub	3	1,894,963 MWh	3.8		790,348 MWh	1.9	-
Formule Energia Elettrica	2	8,298,664 MWh	36.4		8,944,992 MWh	54.6	-
Foreign Gas Hub	3	115,358 MWh		0.2	405,383 MWh	-	0.8
Crude oil	2	7,000 Bbl		0.1	12,400 Bbl	-	0.2
Refined oil/coal	2	4,100 Ton		0.2	9,100 Ton	-	0.7
Formule Energia Elettrica	2	7,892,951 MWh		45.5	8,676,054 MWh	-	63.1
Total commodity derivatives			**40.2**	**46.0**		**56.5**	**64.8**

Financial instruments reported as current assets and liabilities represent derivative contracts whose execution is expected to take place within the next financial year. During the 2017 financial year, there were no transfers between the different levels of fair value indicated above.

With regard to derivatives on current and long-term interest rates in the form of Interest Rate Swaps (IRS) as at 31 December 2017, the Group's net exposure was positive by 26.4 million euros, compared with a positive exposure of 39.5 million Euros as at 31 December 2016. The slight decrease in the fair value as compared to the previous year, in view of interest rate curves that were depressed and mainly stable rates over the financial periods, is due to the achievement of the positive differential of the derivatives for that period.

The fair value of derivatives set up to hedge the exchange rate and the fair value of foreign currency loans in the form of Cross Currency Swaps (CCS) is positive in the amount of 5.3 million euros as at 31 December 2017, as compared to a positive assessment, amounting to 25.9 million euros, as at 31 December 2016. The positive change in fair value in the amount of 20.6 million euros is due prevalently to the exchange rate, since the Japanese yen depreciated considerably on the euro during 2017 (approximately 12 basis points from the beginning of the year).

At 31 December 2017 the net fair value of commodity and currency derivatives was negative for 5.8 million euros, as compared to a negative fair value of 8.3 million euros at 31 December 2016. The decrease in absolute terms of the fair value of assets and liabilities, compared to 31 December 2016, was linked - especially in relation to the contracts related to special price arrangements ("Formule Energia Elettrica"), which constitute the absolute majority of the company's contracts - to a change in the Group's procurement dynamics, also due to the absence of extraordinary events that by contrast affected procurement during the previous financial period following the crisis of French nuclear plants.

Interest rate and foreign exchange derivative instruments held as at 31 December 2017, subscribed in order to hedge loans, can be classed into the following categories:

Interest rate and foreign exchange derivatives (financial operations)						
Type	**31 December 17**			**31 December 16**		
	Notional	**Fair Value Assets**	**Fair Value liabilities**	**Notional**	**Fair Value Assets**	**Fair Value liabilities**
- Cash Flow Hedge	421.9 mn	-	0.9	18.5 mn	-	1.2
- Fair Value Hedge	149.8 mn	5.3	25.7	149.8 mn	25.9	31.5
- Non Hedge Accounting	1,000 mn	60.8	7.9	1,000 mn	83.6	11.4
Total fair value		**66.1**	**34.5**		**109.5**	**44.1**
Type	**31 December 17**			**31 December 16**		
	Income	**Expenses**	**net effect**	**Income**	**Expenses**	**net effect**
- Cash Flow Hedge		(0.9)	(0.9)	-	(1.0)	(1.0)
- Fair Value Hedge	10.4	(28.9)	(18.5)	15.9	(10.8)	5.1
- Non Hedge Accounting	38.9	(38.8)	0.1	37.6	(37.0)	0.6
Total income/expenses	**49.3**	**(68.6)**	**(19.3)**	**53.5**	**(48.8)**	**4.7**

Interest rate derivatives identified as cash flow hedges show a residual notional amount of 421.9 million Euros (18.5 million Euros as at 31 December 2016) against variable rate loans of the same amount. With regard to the notional increase, it should be noted that during March 2017 four new derivatives on interest rates were subscribed for a notional value of 100 million euro each. These derivatives, with a negative fair value of 0.3 million euros as of 31 December 2017, have been hedged to cover a future highly probable financing operation with a total nominal value of 400 million euros and expected to be issued in 2020. These derivatives do not provide for the settlement of the differentials before the underlying issue transaction has been carried out, therefore they do not produce effects in the form of effective expenses or income. Furthermore, in May 2017, a derivative with an original notional amount of 11.7 million euros (11.3 million euros of 31 December 2017) was subscribed to hedge a loan originally amounting to 13.3 million euros disbursed by Cassa Depositi e Prestiti to the subsidiary Hera Luce Srl, functional to the investments in the public lighting systems managed by the Group.
Charges associated with this class of derivatives predominantly refer to cash flows realised, or to the recording of shares of flows, which shall have a financial impact in the following period. As at 31 December 2017, the breakdown of net charges relating to derivatives classified as cash flow hedge amount to 0.9 million Euros (1 million euros as of 31 December 2016).
All hedge relationships between the above derivative contracts and their current or future underlying liabilities resulted in recording net income in the amount of 0.4 million euros to the income statement, net of the relevant tax effect for the Group (0.6 million euros as of 31 December 2016). These revenues can be broken down as follows:

Cash Flow Hedge	**31 December 17**			**31 December 16**		
	Positive component	**Negative component**	**Total**	**Positive component**	**Negative component**	**Total**
Changes in expected financial flows		(0.3)	(0.3)	0.1		0.1
Amount transferred to the income statement	0.7		0.7	0.5		0.5
Effect of derivatives comprehensive income statement Cash Flow Hedge	**0.7**	**(0.3)**	**0.4**	**0.6**	**-**	**0.6**

The derivatives on interest rates and exchange rates, identified as fair value hedges of liabilities reported in the balance sheet have an overall negative fair value of 20.4 million euros as compared to a negative fair value of 5.6 million euros, as at 31 December 2016. The negative change in fair value for this period is due prevalently to the exchange rate associated with the Cross Currency Swap (CSS) outline above.

The table below provides a breakdown at 31 December 2017 of financial income and expense associated with derivatives designated as fair value hedges and related underlying liabilities, as adjusted for the income and losses attributable to the hedged risk:

Fair Value Hedge	31 December 17			31 December 16		
	Income	Expenses	Total	Income	Expenses	Total
- Valuation of derivatives	5.7	(20.5)	(14.8)	10.9	(2.6)	8.3
- Accrued Interest		(0.2)	(0.2)	0.2	-	0.2
- Cash flow achieved	4.7	(8.2)	(3.5)	4.8	(8.2)	(3.4)
Derivatives financial impact Fair Value Hedge	**10.4**	**(28.9)**	**(18.5)**	**15.9**	**(10.8)**	**5.1**

Underlying	31 December 17			31 December 16		
	Income	Expenses	Total	Income	Expenses	Total
Financial liabilities valuation	20.5	(5.7)	14.8	2.6	(10.9)	(8.3)

The derivatives on interest rates, identified as non-hedge accounting hedges, have an overall fair value of 52.9 million euros (72.2 million euros as of 31 December 2016). In this regard, it should be noted that, during 2015 the Group decided to restructure its portfolio of derivatives as part of a move to review the balance between debt at fixed rates and debt at variable rates. This restructuring resulted in revoking certain hedging relationships and signing new derivative contracts that do not qualify for hedge accounting under IAS 39. The new derivative contracts, despite being classified as non-hedge accounting, have as their main objective to provide coverage from interest rate fluctuations and have no impact on the income statement (mirroring).

The breakdown as at 31 December 2017 of financial income and expense associated with derivatives designated as non-hedge accounting is as follows:

Non Hedge Accounting	31 December 17			31 December 16		
	Income	Expenses	Total	Income	Expenses	Total
- Valuation of derivatives	3.6	(22.8)	(19.2)	1.8	(20.4)	(18.6)
- Accrued Interest		(0.1)	(0.1)	0.2	(0.2)	-
- Cash flow achieved	35.3	(15.9)	19.4	35.6	(16.4)	19.2
Derivatives financial impact Non Hedge Accounting	**38.9**	**(38.8)**	**0.1**	**37.6**	**(37.0)**	**0.6**

The economic effect associated with the assessment of this type of hedge as compared to the previous financial year, reflects changes in the fair value of the financial instruments described above. No significant ineffective portions were found in the financial year.

Commodity derivative instruments held as at 31 December 2017 can be classed into the following categories:

Interest rate and foreign exchange derivatives (financial operations)						
Type	**31 December 17**			**31 December 16**		
	Fair Value Assets	**Fair Value liabilities**	**net effect**	**Fair Value Assets**	**Fair Value liabilities**	**net effect**
- Hedge Accounting	6.2		6.2			
- Non Hedge Accounting	34,0	46.0	(12.0)	56.5	64.8	(8.3)
Total fair value	**40.2**	**46.0**	**(5.8)**	**56.5**	**64.8**	**(8.3)**
Type	**31 December 17**			**31 December 16**		
	Income	**Expenses**	**net effect**	**Income**	**Expenses**	**net effect**
- Non Hedge Accounting	115.1	(106.2)	8.9	84.1	(81.6)	2.5

Commodity derivatives identified as cash flow hedges are associated with planned future purchase of electricity highly likeable. All hedge relationships between the above derivative contracts comprised in the "Formule Energia Elettrica" and their underlying liabilities resulted in recording net income in the amount to 4.3 million euros to the income statement, net of the relevant tax effect for the Group.
The commodity derivatives classified as non-hedge accounting mainly include contracts put in place substantially for hedging purposes, but which, on the basis of the strict requirements set forth by international accounting standards, cannot be formally classified under hedge accounting. In any event, these contracts generate income and charges referring to higher/lower purchase prices of raw materials and, as such, are recognised as operating costs.
Overall, these derivatives, in the 2017 financial year, generated a net income of 8.9 million euros, which essentially correspond to respective changes in the opposite direction in the costs of raw materials (gas and electricity) and in all respects form an integral part of this.

Interest rate risk and currency risk on financing transactions

The cost of financing is affected by interest rate fluctuations. In the same way, the fair value of financial liabilities is also subject to interest rate and exchange rate fluctuations.
At the same time, to mitigate exchange rate volatility risk, the Group has stipulated foreign exchange derivatives (Fair Value Hedge) to fully hedge loans in foreign currency. At the same time, to mitigate exchange rate volatility risk, the Group has stipulated foreign exchange derivatives (Fair Value Hedges) to fully hedge loans in foreign currencies.
This Risk Mitigation policy is detailed in the management report, which can be consulted for further information on this topic (see in particular the section "Rate Risk" and "Exchange rate risk not connected to the commodity risk")

Sensitivity Analysis - Financial transactions

In conjecturing an instant shift of -25 basis points in the interest rate curve with respect to the interest rates effectively applied for the assessments as at 31 December 2017, at like-for-like exchange rates, the potential increase in fair value of the existing derivative financial instruments on interest rates and exchange rates would amount to roughly 6.1 million euros. Likewise, conjecturing an instant shift of +25 basis points in the interest rate curve, there would be a potential decrease in fair value of about 5.8 million euros.
These changes in fair value of financial instruments accounted for as hedges would have no effect on the income statement if it were not for their potential ineffective portion, which moreover is not significant.-
As to derivatives designated as fair value hedges, any change in fair value would not have any effect on the income statement, other than for the credit adjustment part, as any such change would be essentially offset by a movement in the opposite direction of the hedged liability.
Assuming an instant change of 10% in the euro/yen exchange rate, given the same interest rates, the potential decrease in fair value of the derivative financial instruments in place at 31 December 2017 would amount to approximately 16.3 million euros. Likewise, assuming an instant reduction of the same amount, the potential fair value increase would be approximately 19.9 million euros. As exchange rate derivatives related to borrowing transactions are treated as fair value hedges, any change in these fair values would not have any effect on the income statement, other than for the credit

adjustment part, as any such change would be offset by a movement in the opposite direction of the hedged liability.

Market risk and currency risk on commercial transactions

Concerning the wholesale business carried on by Hera Trading S.R.L., the Group manages risks related to the misalignment between indexation formulas related to the purchase of gas and electric energy and the indexation formulas related to the sales of the same commodities (including contracts entered into at fixed prices) as well as exchange rate risks in case the trading contracts for the commodities are denominated in currencies other than the euro U.S. dollar).

With reference to these risks, the Group has set up a number of commodities derivatives aimed at pre-establishing the effects on sales margins irrespective of changes in market conditions.

Although they do not formally fall under the IAS 39 criteria to be accounted for under hedge accounting, these derivatives effectively serve the function of simply hedging for fluctuations in prices and exchange rates on raw materials purchased, and fall within the Risk Mitigation Policy detailed in the management report; please refer to this report for further information (see in particular the section "risks associated with the macroeconomic environment").

Sensitivity Analysis - Commercial transactions

In assuming an instant 10 dollar-per-barrel rise in the Brent price, with no change in the Euro/Dollar exchange rate, and no change in the curve of the national standard price, the potential increase in the fair value of derivative financial instruments held as at 31 December 2017 would amount to approximately Euro 5.2 million. On the contrary, an instant fall in the same amount would bring about a potential decrease in the fair value of the instruments of approximately 5.2 million euros.

In assuming an instant +5 Euro/MWh change in the national standard price curve, with no change in the Euro/Dollar exchange rate, and no change in the Brent price, the potential increase in the fair value of derivative financial instruments held as at 31 December 2017 would amount to approximately 9.8 million euros. On the contrary, an instant change of -5 Euro/MWh would bring about a potential decrease in the fair value of the instruments of around 9.8 million euros.