



# Energy & environmental markets

8 April 2008

## Energy weekly

### Energy and Carbon Market Analysis

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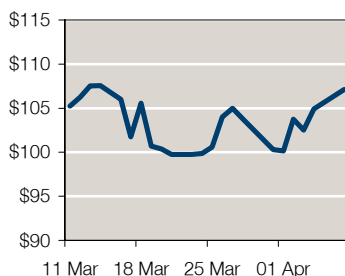
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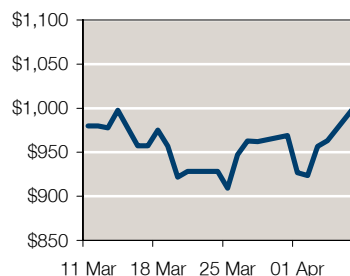
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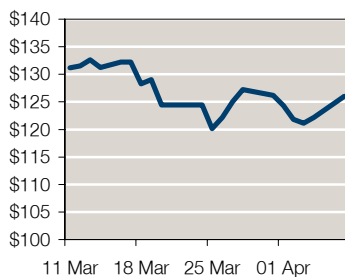
### Energy at the blink of an eye



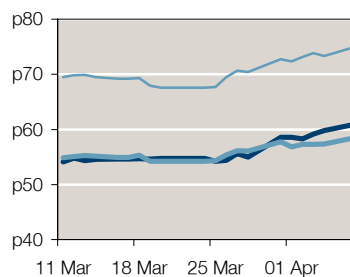
— Brent IPE, 1st Month (\$/bbl)



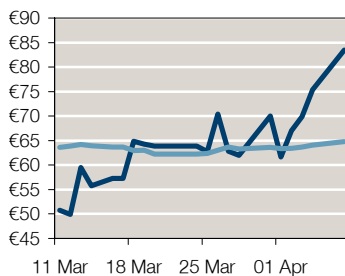
— GasOil IPE, 1st Month (\$/ton)



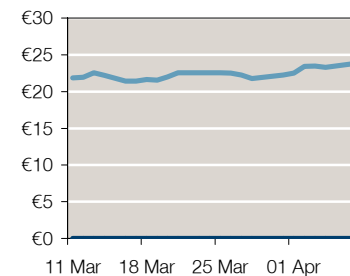
— Coal API#2, Cal9 (\$/ton)



— Gas NBP, day ahead [p/therm]  
— Gas NBP, SUM9 [p/therm]  
— Gas NBP, WIN9 [p/therm]



— Ge Power, day ahead [€/MWh]  
— Ge Power, Cal9 [€/MWh]



— EUA ECX, Phase One [€/ton]  
— EUA ECX, Dec8 [€/ton]

Source: Reuters, Fortis

## Crude oil and oil products

	07-04	01-04	04-03
Brent Crude [\$]/bbl			
IPE 1st Contract	107.1	100.2	97.5
WTI Crude [\$]/bbl			
NYMEX 1st Contract	109.1	101.0	99.5
Fuel Oil 3.5%S, spot [\$]/ton			
FOB Barge ARA	490	458	461
Fuel Oil 1.0%S, spot [\$]/ton			
FOB Barge ARA	564	510	522
ULSD 50ppm, spot [\$]/ton			
Cargo NWE	1060	966	960
ULSD 10ppm, spot [\$]/ton			
Barge ARA	1058	976	963
GO 0.2% spot [\$]/ton			
FOB Barge ARA	502	925	905
Jet Fuel, spot [\$]/ton			
GIF Cargo NWE	1111	1020	980

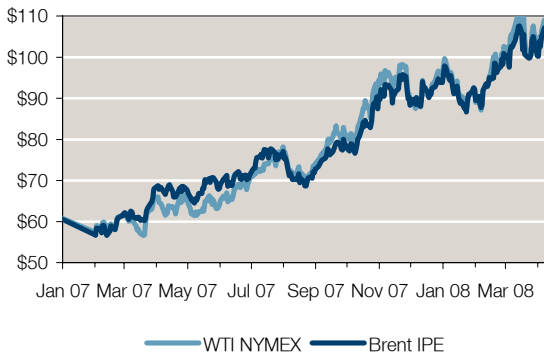
Source: Reuters, Fortis

Crude Oil prices decreased the first half of last week after tensions in Basra, Iraq, relieved last Monday. Throughout the week, fear of economic slowdown in the US and therefore decreasing energy demand again took the upper hand. US crude oil traded at \$104.42/bbl and Brent Crude at \$103/bbl.

On 4<sup>th</sup> of April, the US published data showing a decrease of payrolls for the third consecutive month, after which the US dollar dropped heavily versus the dollar and Crude oil prices again picked up last Friday as investors tried to hedge against inflation.

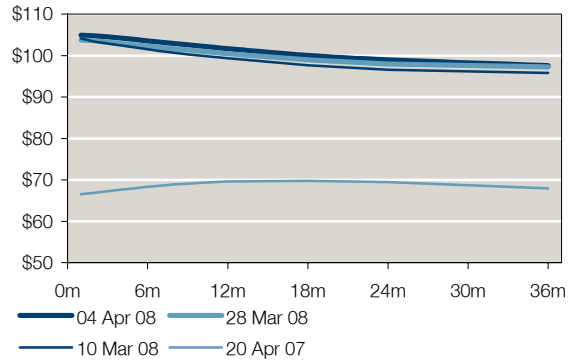
Additional bullish news came from fires at US and European refineries, stirring concern about refined products supply before the start of the driving season. Gasoil moved up to all-time highs trading up almost 50 dollars from last week's close and the crudes appear to be heading in the same direction.

Crude Oil Futures IPE, First Month [\$]/bbl



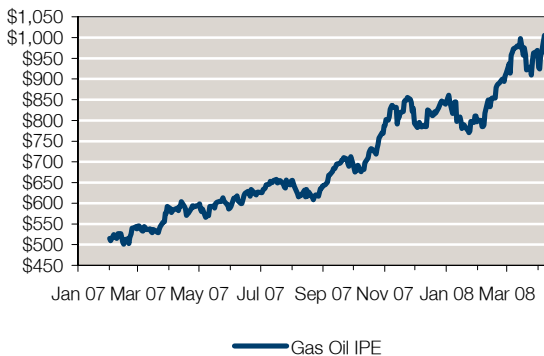
Source: Reuters, Fortis

Brent Futures IPE [\$]/bbl



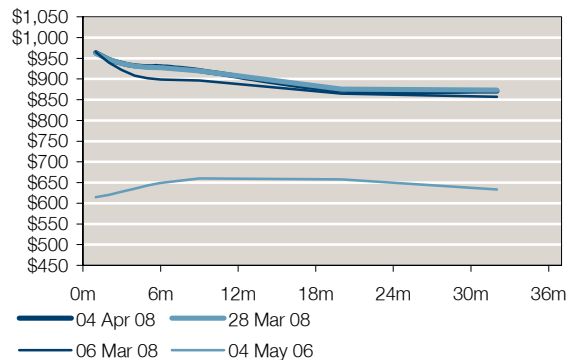
Source: Reuters, Fortis

Gas Oil Futures IPE, First Month [\$]/bbl



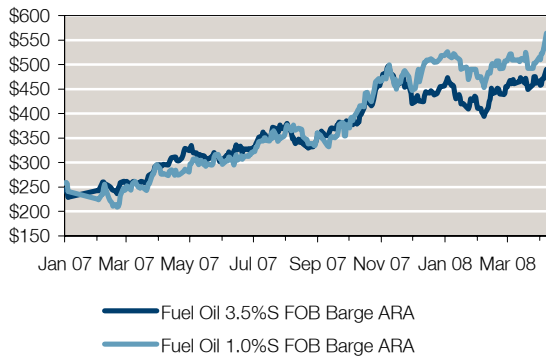
Source: Reuters, Fortis

Gas Oil Futures IPE [\$]/bbl

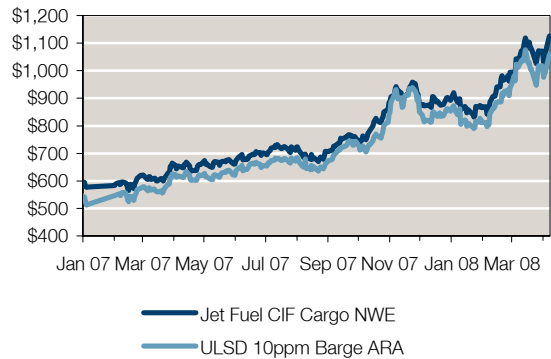


Source: Reuters, Fortis

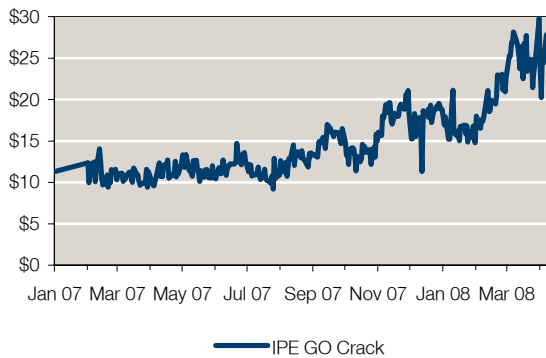
**Oil Products Spot, Fuel Oil [\$/ton]**



**Oil Products Spot, Middle Distillates [\$/ton]**

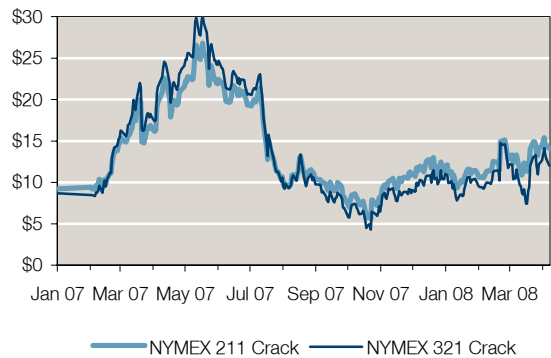


**IPE Gasoil Crack, first month futures [\$/bb]**



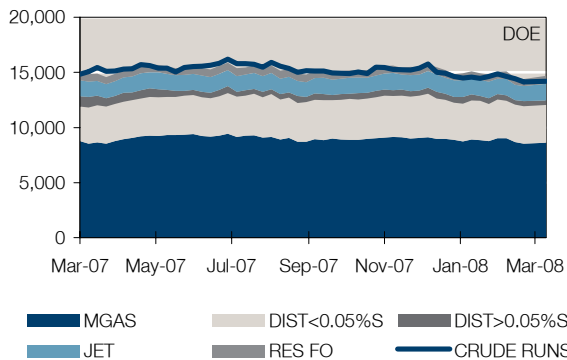
IPE GO Crack = LGO/7.45 - LCO  
 LGO Gas Oil IPE [\$/ton], 7.45bb/ton  
 LCO Brent IPE [\$/bb]

**NYMEX 211 and 321 Cracks, first month futures [\$/ton]**

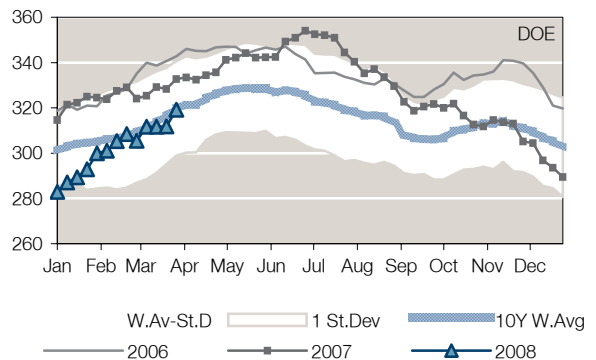


211 Crack = ((HU\*42+HO\*42)/2) - CL; 321 Crack = ((2\*HU\*42+HO\*42)/3) - CL  
 HU Unleaded Gasoline NYMEX [\$/gallon]  
 HO No.2 Heating Oil NYMEX [\$/gallon], 42gallons/bbl

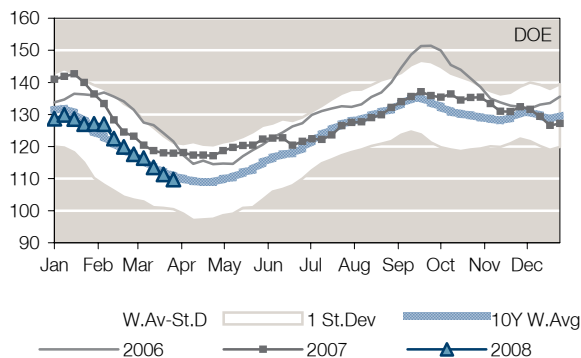
**US Refinery Production [bbl/day]**



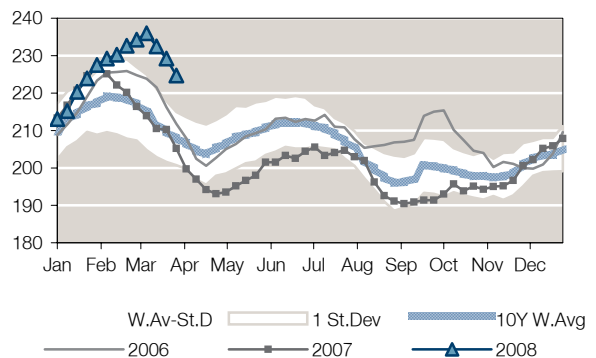
**US Crude Stocks [million bbl]**



**US Distillates Stocks [million bbl]**



**US Gasoline Stocks [million bbl]**



Source: Bloomberg, Reuters, Fortis

## Natural gas

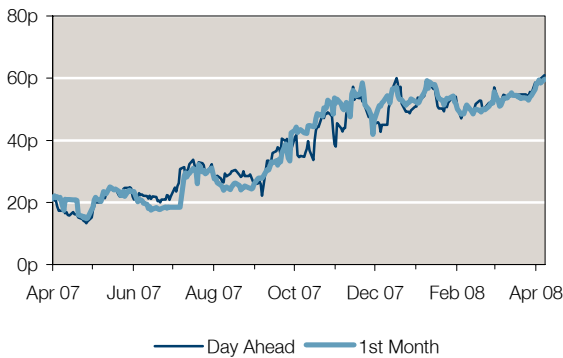
Gas OTC	07-04	01-04	04-03
NBP day ahead [£p/therm]	61.0	58.6	53.0
NBP summer [£p/therm]	58.6	56.9	53.8
NBP winter [£p/therm]	75.1	72.4	66.2
TTF day ahead [€/MWh]	25.4	25.1	23.5
TTF 1st summer [€/MWh]	25.2	24.5	29.2
TTF 1st winter [€/MWh]	31.1	30.0	29.2

Source: Reuters, Fortis

NBP gas prices increased throughout the week on high oil prices and supply concerns. On Friday though, day ahead prices dropped on warm weather and decreasing instant demand.

For this week, prices are expected to stay high due to colder weather. Supply fears, oil and an expected bullish spot market support the front end of the curve.

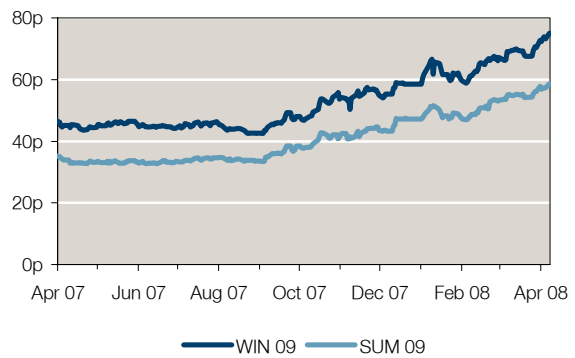
NBP gas front end prices [£pence/therm]



1therm = 10-5Btu = 29.3kWh = 105.5MJ

Source: Reuters, Fortis

NBP gas summer and winter prices [£pence/therm]



1therm = 10-5Btu = 29.3kWh = 105.5MJ

Source: Reuters, Fortis

## Coal

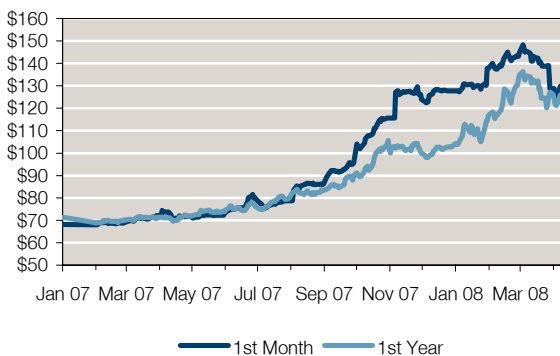
Coal OTC	07-04	01-04	04-03
API#2 first month [\$/ton]	129.9	128.8	146.8
API#2 first quarter [\$/ton]	130.0	129.2	145.0
API#2 first year [\$/ton]	126.0	124.4	133.8
API#4 first month [\$/ton]	103.8	102.1	117.8
API#4 first quarter [\$/ton]	103.7	102.5	116.6
API#4 first year [\$/ton]	102.5	100.4	108.3

Source: Reuters, Fortis

Last week the coal market followed the trend in oil, first trading down till Thursday and then again rising with API#2 Cal09 contract going to \$122.20/t. Yesterday it closed even higher at \$126/t.

News that China faces another coal shortage is pushing prices upwards.

API#2 coal prices [\$/ton]



1ton coal = 6.98MWh = 25.1GJ

Source: Reuters, Fortis

Implied Freight API#2 (R'dam) - API#4 (S.Africa) [\$/ton]



1ton coal = 6.98MWh = 25.1GJ

Source: Reuters, Fortis

## Power

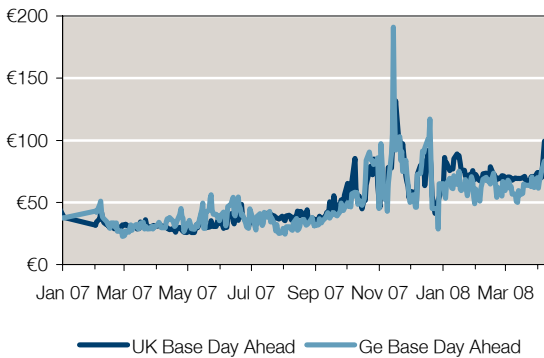
Base Load OTC	07-04	01-04	04-03
UK day ahead [€/MWh]	78.5	57.8	54.0
UK summer [€/MWh]	56.2	55.0	52.6
UK winter [€/MWh]	67.5	65.4	61.5
Ge day ahead [€/MWh]	74.8	66.1	61.4
Ge summer [€/MWh]	59.9	58.2	60.7
Ge winter [€/MWh]	70.3	68.7	70.6

Source: Reuters, Fortis

European Power prices surged to their highest level this year as unexpected cold temperatures overlap with maintenance work on power plants as well as on crossborder interconnections. Alone, RWE cut its overall crossborder capacity from 8500MW to 7000MW. Moreover, France is doing heavy maintenance work on its nuclear power plants for the moment.

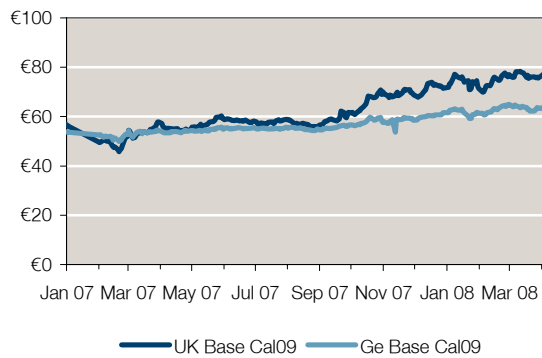
Supply scarcity should ease as milder weather is expected for the second half of the week.

UK and German day ahead power prices [€/MWh]



Source: Reuters, Fortis

UK and German first year power prices [€/MWh]



Source: Reuters, Fortis

## CO<sub>2</sub> emission allowances

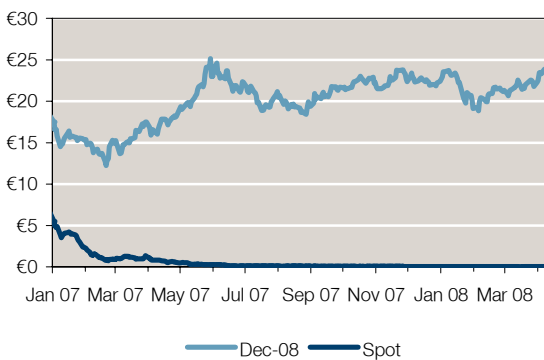
CO <sub>2</sub> allowances	07-04	01-04	04-03
PowerNext spot [€/tCO <sub>2</sub> ]	0.02	0.02	0.02
EUA fut Dec08 [€/tCO <sub>2</sub> ]	23.8	22.5	20.7
EUA fut Dec12 [€/tCO <sub>2</sub> ]	26.9	25.5	23.6
sCER Dec08 [€/tCO <sub>2</sub> ]	15.9	15.4	15.1

Source: Reuters, Fortis

The week was dominated by the release of the verified emissions data for 2007. The European Commission decided to make the numbers publicly available once it received 93% of the data, which was the case on April 2nd. For the whole of the EU-ETS, excluding Bulgaria and Romania, 2007 emissions are estimated almost 1% higher than in 2006.

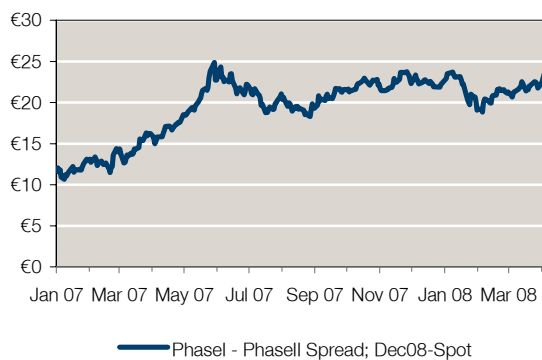
As the dominant market vision prior to the release of the data was that 2007 emissions would be lower than in 2006, this report had a bullish effect on Phase Two prices, rising more than EUR 1/tCO<sub>2</sub> the same day.

EUA prices [€/tCO<sub>2</sub>]



Source: Reuters, Fortis

EUA Phase I / Phase II Spread [€/tCO<sub>2</sub>]

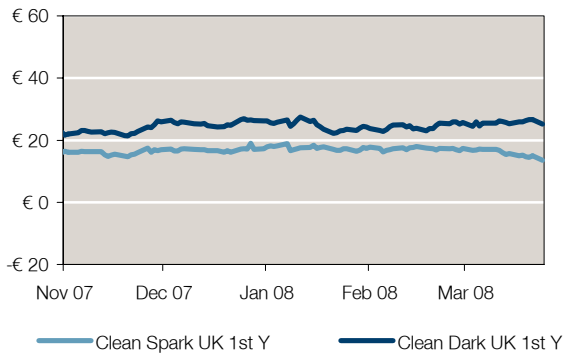


Source: Reuters, Fortis

## Spark and dark spreads

### Clean Spark and Dark Spread [€/MWh]

UK (based on UK power, EUA 1st yr, NBP gas and API#2 coal)



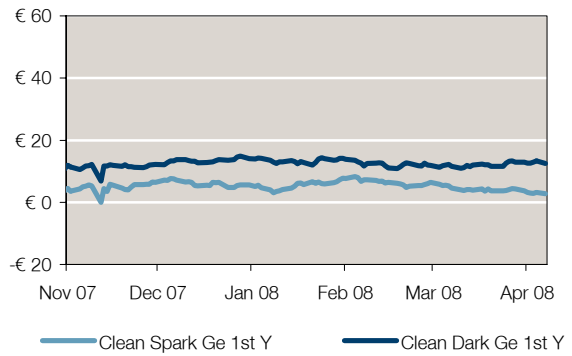
$$\text{Spark\_Spread} = \text{Power\_Price} - \text{Gas\_Price} / 53\% - \text{EUA\_Price} * 380$$

$$\text{Dark\_Spread} = \text{Power\_Price} - \text{Coal\_Price} / 38\% - \text{EUA\_Price} * 900$$

Source: Reuters, Fortis

### Clean Spark and Dark Spread [€/MWh]

Germany (based on Ge power, EUA 1st yr, TTF gas and API#2 coal)



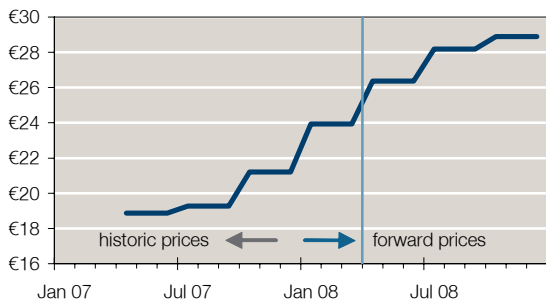
$$\text{Spark\_Spread} = \text{Power\_Price} - \text{Gas\_Price} / 53\% - \text{EUA\_Price} * 380$$

$$\text{Dark\_Spread} = \text{Power\_Price} - \text{Coal\_Price} / 38\% - \text{EUA\_Price} * 900$$

Source: Reuters, Fortis

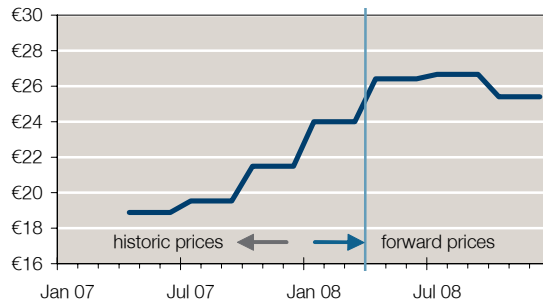
## Gproxy and GasUnie

### GProxy-S



Source: Reuters, Fortis

### GasUnie



Source: Reuters, Fortis

## Price indications, mid market

07 Apr (01 Apr)

### Crude Oil & Oil Products

	Brent [\$/bb]	3.5%S Fuel Oil FOB Barges ARA [\$/ton]	1% Fuel Oil FOB Cargo NWE [\$/ton]	Gasoil FOB Cargo NWE [\$/ton]	ULSD 10ppm FOB Barges ARA [\$/ton]	Jet CIF Cargo NWE [\$/ton]
Spot	106.08 (98.79)	490.0 (457.5)	541.0 (497.5)	1006.5 (943.5)	1058.0 (976.0)	1125.5 (1029.5)
Swap May 08	107.07	490.0 (454.8)	531.0 (500.0)	986.9 (919.5)	(968.5)	1112.9 (1018.0)
Swap Q3 08	106.85 (99.73)	492.0 (462.5)	530.0 (500.3)	975.6	1015.6 (952.3)	1069.6 (1006.3)
Swap Q4 08	105.97 (98.83)	493.0 (468.5)	529.0 (502.5)	960.4 (902.2)	998.4 (940.2)	1055.9 (986.7)
Swap Q1 09	105.06 (98.16)	495.0 (473.3)	533.0 (507.0)	952.4 (897.4)	996.4 (941.4)	1047.4 (983.2)
Swap Q2 09	103.83 (97.26)	496.0 (477.8)	530.0 (513.0)	930.6 (879.0)	972.6 (921.0)	1023.6 (967.5)
Swap Y 2009	102.54 (96.31)	493.0 (473.0)	426.0 (506.0)	908.2 (859.2)	951.2 (902.2)	999.2 (950.2)
Swap Y 2010	100.07 (94.74)	-	-	876.3 (832.8)	-	-

Source: Reuters, Fortis

### Gas

	NBP OTC close [p/therm]	Zeebrugge OTC close [p/therm]	TTF OTC close [€/MWh]	GProxy-S [€/MWh]	GasUnie [€/MWh]	Coal	API#2 CIF ARA [\$/ton]	EUAs [€/tCO <sub>2</sub> ]
Day Ahead	61.00 (58.60)	60.45 (59.40)	25.40 (25.10)	-	-	May 08	129.88 (128.78)	Spot PwrNxt 0.02 (0.02)
May 08	59.65 (58.25)	58.38 (58.78)	25.18 (24.59)	26.37	26.42	Q3 08	129.98 (129.23)	ECX Dec 08 23.82 (22.52)
Jun 08	58.65 (57.90)	59.18 (58.50)	25.19 (24.61)	26.37	26.42	Q4 08	130.25 (129.50)	ECX Dec 09 24.48 (23.10)
SUM 09	58.60 (56.85)	65.91 (64.53)	25.18 (24.51)	28.80	24.08	Q1 09	129.80 (129.15)	ECX Dec 12 26.85 (25.53)
WIN 09	75.05 (72.35)	66.99 (73.00)	31.14 (30.02)	28.93	24.96	Y 2009	119.80 (118.05)	Spot PwrNxt 0.02 (0.02)

1therm = 29.31kWh

API#2 coal: 25.12GJ/ton

Source: Reuters, Fortis

### Power

	UK ICE [€/MWh]	Germany RWE [€/MWh]	France PowerNext [€/MWh]	Belgium EnDex [€/MWh]	Netherlands APX/EnDex [€/MWh]	Carbon Adjusted Spreads	UK Spark (NBP) [€/MWh]	UK Dark (API#2) [€/MWh]	Ge Spark (TTF) [€/MWh]	Ge Dark (API#2) [€/MWh]
Day Ah.	78.50 (57.75)	83.50 (61.63)	98.50 (75.53)	-	81.28 (67.15)	Day Ah.	49.7	68.2	35.6	52.3
May 08	58.60 (58.03)	55.43 (55.00)	55.31 (55.25)	58.91 (59.58)	61.20 (61.17)	May 08	25.6	43.0	7.9	24.2
Jun 08	58.96 (57.80)	62.10 (60.63)	61.93 (61.13)	63.90 (63.76)	68.04 (66.58)	Y 2009	13.6	25.2	2.8	12.6
SUM 09	56.20 (54.95)	59.89 (58.17)	68.42 (66.48)	69.11 (67.88)	64.39 (64.39)					
WIN 09	67.50 (65.40)	70.34 (68.69)	78.65 (76.72)	78.38 (76.85)	74.33 (74.33)					

Gas: efficiency 53%, emissions 0.38t/MWh

Coal: efficiency 38%, emissions 0.90t/MWh

Source: Reuters, Fortis

GasUnie:  $1.967 + 0.01692 * FOE(603) + 0.03388 * GOE(603)$ GProxy-S:  $0.024 * FOE(703) + 0.023 * GOE(703) + 0.1 * BRIE(703)$ Nc\* (Fortis calculation):  $0.422 + 0.01116 * API2E(311) + 0.09231 * ZEE(311) + 0.00907 * BRIE(311)$ 

FO: Monthly Average, Fuel Oil 1% FOB Barge ARA

GO: Monthly Average, GasOil 0.2% FOB Barge ARA

GOI: Monthly Average, GasOil IPE Swap, first contract

BRI: Monthly Average, Brent IPE Swaps, first contract

EUR: EUR/USD Exchange Rate

Subscript E means that prices are in EUR

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