NORDIC ELECTRICITY MARKET

6.5.2019 Markus Herranen, Gasum Portfolio Services Oy

CHANCES FOR DRIER WEATHER NEXT WEEK

Forecast to week 19:	
ENOFUTBLQ3-19	Bullish (>0%)
ENOYR-20	Bullish (>0%)
NP System	Bullish (>0%)
NEDEC9	Bullish (>0%)

Market signals	spot	Q3-19	YR-20
Hydrologic balance	→	→	→
Precipitation forecast	→	→	→
Temperature forecast	→	→	→
Spot		↑	→
Production and transmission exch.	↑	→	→
Emissions allowance	↑	↑	↑
Coal price	↑	↑	↑
German prices	→	→	→
Technical analysis		↓	↓

FORECAST TO WEEK 19

ELECTRICITY DERIVATIVES

The nearest quarter

The weather is rather cold for the time of year, but there will be an upturn in temperatures, taking them close to the early-to-mid-May normal towards the end of the week. Next week, the temperatures are likely to remain close to the normal level. Above-normal precipitation will be seen throughout the current week, and the hydro balance will go up. There is, however, considerable uncertainty regarding next week's precipitation levels as weather forecasts indicate the chance of high pressure and a consequent turn to dry weather. We expect the uncertainty relating to the weather type to result in fluctuation in quarterly products in the weeks ahead, but precipitation is likely to decrease after the current week and the improvement of the hydro balance will stall. Spot prices will rise from preceding weeks. We expect a slight rise in quarterly product prices.

Annual products

The broad European weather pattern is considerably colder than normal for the time of year, providing support for fuel and emission allowance prices. However, the general market mood turned pessimistic on Sunday as Trump threatened to raise Chinese import tariffs. This means the market is yet again concerned about the escalation of the trade war following a period of high market confidence in a deal being reached. Despite the threat of trade war and the general mood of the market, emission allowance prices have taken another upturn. We expect a slight rise in annual product prices.

SPOT MARKET

The weather is clearly colder than normal for the time of year, but the latter half of the week will see a clear upturn in temperatures. Towards the end of the week, a near-normal level will be reached in temperatures. Melting has slowed considerably, and flow rates have decreased to a below-normal level. Hydropower producers have regained control and we expect a clear rise in spot prices from last week. Upward pressure is, however, curbed by wind power production being mainly high. We expect the system price to settle at an average of €41.5/MWh. We expect the Finnish area price to differ from the system price due to the maintenance of the Olkiluoto 2 nuclear power plant unit. In addition, maintenance of the interconnection between Southern Sweden and Lithuania is also increasing the Baltic price level and has an upward impact also on the Finnish area price. Finnish wind power generation will, however, rise to a high level after Monday, reducing the area price risk. We expect the Finnish area price to settle at an average of €44.5/MWh.

EMISSIONS

Emission allowance prices have undergone a downward correction, but the long-term trend is still rising and now the trend is showing signs of an end to the corrective move also in the short term. In addition to the long upward trend and scant auction supply, emission allowance prices are supported by the cold weather type prevailing in Europe. At the same time, downward pressure is created by the weak price of natural gas and the trade tensions. We expect a moderate rise in emission allowance prices.

Product	Date	Value	% chg	Chg (EUR)
ENOFUTBLQ3-19	3.5.2019	41.40	0.7%	0.30
ENOFUTBLQ4-19	3.5.2019	44.18	0.8%	0.33
ENOFUTBLQ1-20	3.5.2019	45.00	0.9%	0.40
ENOFUTBLQ1-21	3.5.2019	40.30	0.7%	0.30
ENOYR-20	3.5.2019	36.50	-0.5%	-0.20
ENOYR-21	3.5.2019	33.00	0.4%	0.13
ENOYR-22	3.5.2019	32.20	0.5%	0.15
ENOYR-23	3.5.2019	32.28	0.6%	0.20
ENOYR-24	3.5.2019	32.00	1.6%	0.50
NEDEC9	3.5.2019	25.18	-2.6%	-0.68
NEDEC20	3.5.2019	25.45	-2.7%	-0.71

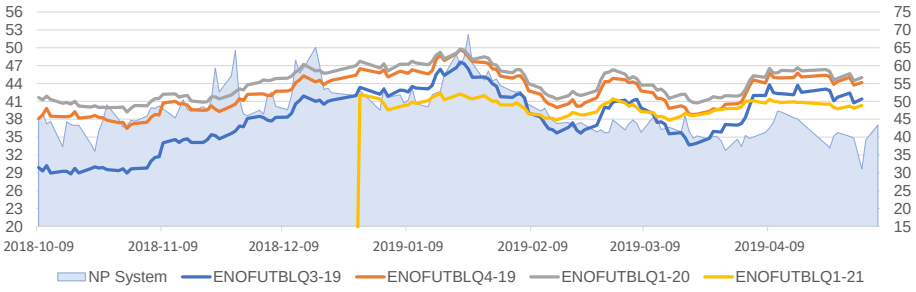
EPAD settlements

3.5.2019 (€/MWh)	2019	2020	2021	2022
SYHEL	4.25	3.05	2.90	3.00
SE1-NP System	-1.00	-1.50	-1.50	-1.50
SE2 - NP System	-1.00	-1.50	-1.50	-1.50
SE3 - NP System	1.40	1.50	1.75	1.75
SE4 - NP System	3.25	3.00	3.00	3.00

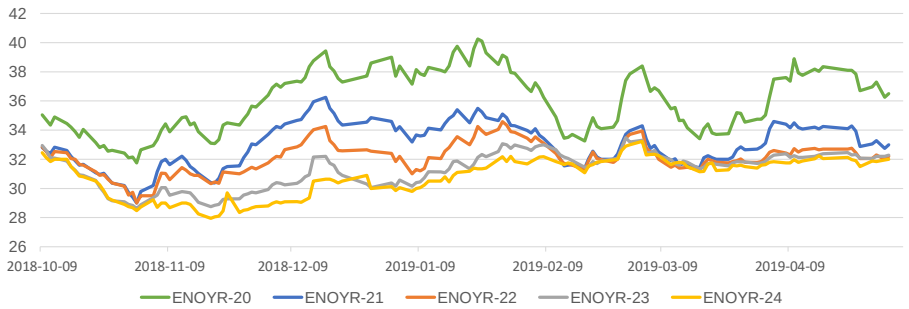
Week's spot price change

Price area (€/MWh)	Date	Value	% chg	Chg (EUR)
NP System	5.5.2019	37.16	0.9%	0.35
NP Area FI	5.5.2019	35.59	-0.6%	-0.21
NP Area SE1	5.5.2019	33.27	-3.3%	-1.13
NP Area SE2	5.5.2019	33.27	-3.3%	-1.13
NP Area SE3	5.5.2019	33.27	-3.3%	-1.13
NP Area SE4	5.5.2019	33.27	-3.3%	-1.13

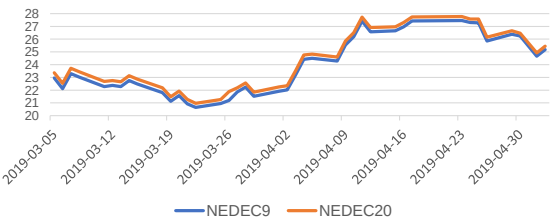
Quarters EUR/MWh (left), NP System EUR/MWh (right)



Years EUR/MWh



Carbon EUR/CO2 t



COMMENTS ON WEEK 18

ELECTRICITY DERIVATIVES

The nearest quarter

Quarterly products were seeking direction last week. The dry and warm weather type ended, but the early part of the week saw a rise in front-quarter prices following slightly drier weather forecasts and forecasts not indicating precipitation levels other than those slightly above normal. After May 1, quarterly products fell in the wake of soft emission allowance prices but recovered on Friday as fuel and emission allowance prices went up. At the weekly level, quarterly products showed a slight increase.

Annual products

Last week saw annual product prices pulled up slightly by quarterly products. After the first half of the week, however, emission allowance prices took a clear downturn, which also took annual products into a downturn. On Friday, coal and natural gas prices rose and emission allowance prices recovered. Support for fuel and emission allowance prices was provided towards the end of the week by the weather picture with clearly colder than normal temperatures seen across Europe.

SPOT MARKET

At the beginning of last week, spot prices were supported by weak wind power generation, but after the first days of the week wind power production rose very high, particularly on Thursday. Very low levels were seen in night-time sport prices due to high flow rates and abundant wind power generation. Demand for electricity was also reduced by the impact of the May 1 public holiday. However, after the early part of the week, temperatures took a clear downturn and the latter half of the week saw the weather get colder than normal for the time of year. The cold temperatures slowed down melting considerably and flow rates took a sharp plunge. Reduced flow rates and increased electricity demand pushed spot prices up again towards the end of the week. At the weekly level, the system price rose slightly but the Finnish area price slipped a little. The Olkiluoto 2 nuclear power plant unit was down for annual maintenance, but imports of electricity from Russia increased from the level of the week before last.

EMISSIONS

Emission allowance prices fell last week. Downward pressure on the price was created by the end of the periodic demand due to the end-of-April deadline for the surrender of emission allowances. The weak price of natural gas and the downward correction going on in the German electricity market also created downward pressure. Later in the week, fuel prices recovered, and the fall of emission prices also halted. Support for fuel and emission allowance prices was provided by the weather picture getting colder across Europe.

DETERMINANTS AFFECTING THE MARKET ON WEEK 19

RESTRICTIONS IN PRODUCTION AND TRANSMISSION CAPACITY

Olkiluoto 2 (890 MW), yearly maintenance 1.-26.5.2019 available 0 MW
Ringhals 3 (1063 MW), yearly maintenance 30.4.-25.5.2019, available 0 MW
Forsmark 1 (984 MW), yearly maintenance 22.4-7.6.2019, available 0 MW

SE3-FI (1200 MW), maintenance 11.-19.5.2019, available 350 MW

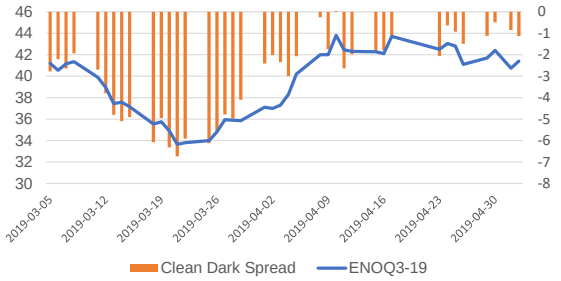
-The utilization rate of Nordic nuclear power plants is currently 75%
-RU-FI transfer profile varies due to capacity charges, average import from Russia last week was 61% of maximum

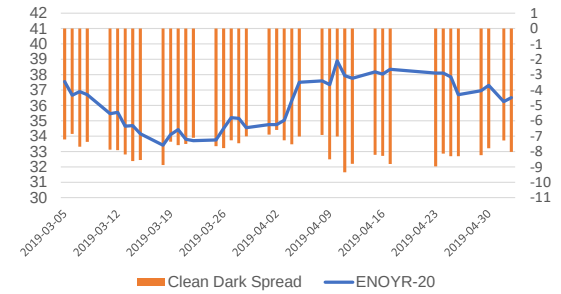
Indicator	ENOFUTBLQ3-19	ENOYR-20
Coal-fired production	23 %	42 %
Coal price	0 %	2 %
Gas price (NBP)	0 %	2 %
German price level	1 %	2 %
Spot	12 %	17 %
Crude oil Brent	5 %	8 %
Water reservoirs	2 %	6 %
EUR/USD FX rate	1 %	4 %
Temperature	8 %	5 %
Precipitation	16 %	13 %

Definition

The above figures measure the ability of market determinants to describe the price changes occured in last 6 months.The affect is measured as Coefficient of Determination*. Each variable is evaluated independently. We use a color scale to demonstrate efficacy, green (strong), yellow (moderate), red (weak)

Forecast history	18	Chg	17	Chg
ENOFUTBLQ3-19	↘	0.7%	↘	#N/A
ENOYR-20	↘	-0.5%	↘	#N/A
NP System	↘	0.9%	↘	-2.0%
NEDEC9	↘	-2.6%	↗	#N/A





AVERAGE SPOT PRICE AND EPAD

Price area (€/MWh)	2012	2013	2014	2015	2016	2017	2018	2019*
NP System	31.20	38.10	29.60	21.00	26.91	29.41	43.99	44.97
NP Area FI - NP System	5.50	3.10	6.40	8.70	5.54	3.78	2.81	0.53
NP Area SE1 - NP System	0.50	1.10	1.80	0.20	2.04	1.43	0.24	-0.89
NP Area SE2 - NP System	0.60	1.10	1.80	1.00	2.04	1.43	0.24	-0.89
NP Area SE3 - NP System	1.10	1.40	2.00	1.00	2.33	1.83	0.55	-0.56
NP Area SE4 - NP System	3.00	1.80	2.30	1.90	2.62	2.77	2.37	-0.20

*Average for period between 1.1.2019-6.5.2019.