

NORDIC ELECTRICITY MARKET

25.3.2019 Markus Herranen, Gasum Portfolio Services Oy

WEATHER TYPE CONTINUES TO BE WETTER THAN NORMAL

| Forecast to week 13: | |
|----------------------|-----------------|
| ENOFUTBLQ2-19 | 📉 Bearish (<0%) |
| ENOYR-20 | 📉 Bearish (<0%) |
| NP System | 📉 Bearish (<0%) |
| NEDEC9 | 📉 Bearish (<0%) |

FORECAST TO WEEK 13

ELECTRICITY DERIVATIVES

The nearest quarter

The weather forecasts have turned slightly wetter during the weekend. The weather type is wetter than normal and there are no clear signs of the weather type change to dry. The hydrobalance continues to increase. The downward pressure to front contract has eased so far, despite of the weak fundamentals, but technically the market is still weak. We expect the front contracts to decrease.

Annual products

The wet and mild weather forecasts and weak fuel prices maintain the downward pressure in annual contract prices. However, the strong technical support level in annual contracts have limited the additionally downward pressure. The gas and coal supply is still fairly strong and high stocks and seasonal decreasing demand keep the demand low. Due to weak fundamentals we think the decreasing development is more likely than increasing. High uncertainty in emission price and strong price fluctuation also fluctuates the annual contract prices.

SPOT MARKET

At the beginning of the week the temperatures and the precipitation are close to normal, but after Tuesday the temperatures start to rise clearly and the weather during the rest of the week is clearly warmer than normal. Also the precipitation increases at the second half of the week to clearly higher than normal. At the same time the inflows increase towards the end of the week. Also in Finland the wind power production increases after Tuesday to clearly higher than normal. During the weekend the transmission line between Finland and Southern Sweden is under maintenance. We expect the system price to decrease at the weekly level and to realize at about 38,0 €/MWh. We expect the Finnish area price to decrease also and to realize slightly lower than system price at the weekly level.

EMISSIONS

Downward pressure to CO2 market is caused by still decreasing gas price. The wind power situation in the Central Europe weakens after the beginning of the week, which supports slightly the emission allowance demand. The political uncertainty remains to be high due to ongoing Brexit negotiations. During this week the Britain is supposed to vote on Brexit agreement again. We expect the emission price fluctuation to continue to be strong, but following the trend, the emission price is heading towards the support level of 18,4 €/t.

Market signals

| | spot | Q2-19 | YR-20 |
|-----------------------------------|------|-------|-------|
| Hydrologic balance | ↓ | ↓ | ↓ |
| Precipitation forecast | ↓ | ↓ | ↓ |
| Temperature forecast | ↓ | → | → |
| Spot | ↓ | ↓ | → |
| Production and transmission exch. | ↓ | → | → |
| Emissions allowance | ↓ | ↓ | ↓ |
| Coal price | ↓ | ↓ | ↓ |
| German prices | ↓ | → | ↑ |
| Technical analysis | ↓ | ↓ | ↓ |

| Product | Date | Value | % chg | Chg (EUR) |
|---------------|-----------|-------|-------|-----------|
| ENOFUTBLQ2-19 | 22.3.2019 | 35.25 | -7.1% | -2.70 |
| ENOFUTBLQ3-19 | 22.3.2019 | 33.80 | -9.0% | -3.35 |
| ENOFUTBLQ4-19 | 22.3.2019 | 38.80 | -5.7% | -2.35 |
| ENOFUTBLQ1-20 | 22.3.2019 | 40.80 | -4.0% | -1.70 |
| ENOYR-20 | 22.3.2019 | 33.70 | -1.3% | -0.45 |
| ENOYR-21 | 22.3.2019 | 32.00 | 1.3% | 0.40 |
| ENOYR-22 | 22.3.2019 | 31.80 | 1.1% | 0.35 |
| ENOYR-23 | 22.3.2019 | 31.66 | -0.4% | -0.14 |
| ENOYR-24 | 22.3.2019 | 31.23 | -0.9% | -0.27 |
| NEDEC9 | 22.3.2019 | 20.65 | -8.1% | -1.83 |
| NEDEC20 | 22.3.2019 | 20.97 | -8.3% | -1.89 |

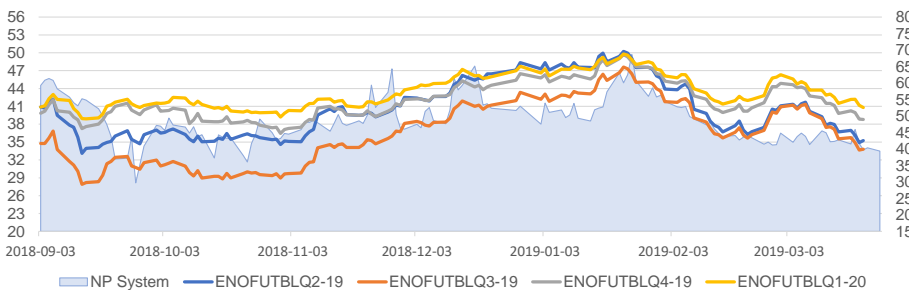
EPAD settlements

| 22.3.2019 (€/MWh) | 2019 | 2020 | 2021 | 2022 |
|-------------------|-------|-------|-------|-------|
| SYHEL | 4.38 | 3.13 | 3.45 | 3.53 |
| SE1-NP System | -1.00 | -1.25 | -1.25 | -1.25 |
| SE2 - NP System | -1.00 | -1.25 | -1.25 | -1.25 |
| SE3 - NP System | 1.85 | 1.90 | 1.75 | 1.90 |
| SE4 - NP System | 3.25 | 3.25 | 3.25 | 3.25 |

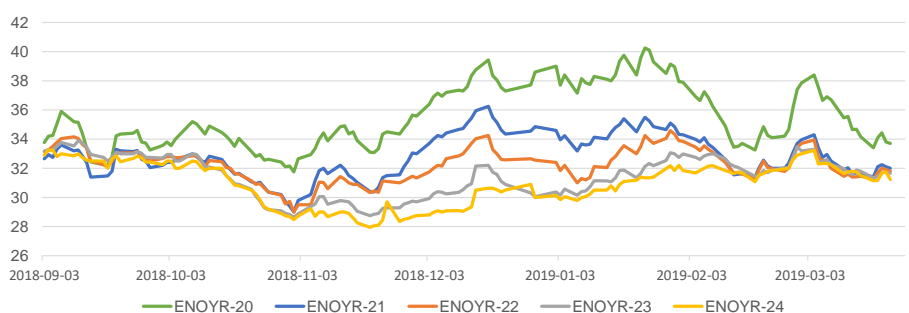
Week's spot price change

| Price area (€/MWh) | Date | Value | % chg | Chg (EUR) |
|--------------------|-----------|-------|-------|-----------|
| NP System | 24.3.2019 | 40.22 | -4.5% | -1.88 |
| NP Area FI | 24.3.2019 | 39.20 | -6.7% | -2.82 |
| NP Area SE1 | 24.3.2019 | 38.89 | -6.5% | -2.69 |
| NP Area SE2 | 24.3.2019 | 38.89 | -6.5% | -2.69 |
| NP Area SE3 | 24.3.2019 | 38.91 | -6.4% | -2.67 |
| NP Area SE4 | 24.3.2019 | 38.91 | -6.4% | -2.67 |

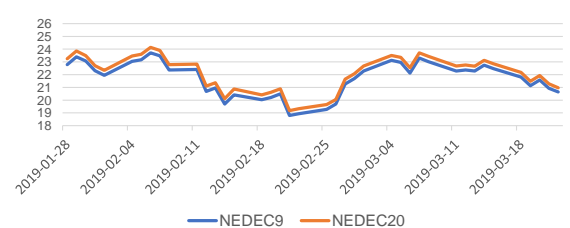
Quarters EUR/MWh (left), NP System EUR/MWh (right)



Years EUR/MWh



Carbon EUR/CO2 t



COMMENTS ON WEEK 12

ELECTRICITY DERIVATIVES

The nearest quarter

Last week the front contracts continued sharply bearish, when the weather was wet and the hydrobalance continued increasing. Also the coal and gas prices continued decreasing. Additionally, the emission price decreased and the weak technical trend strengthened the downward pressure.

Annual products

Last week the annual contracts continued on Monday sharply bearish with the front contracts and weak fuels and emission price. However, after Monday the annual contract prices recovered close to strong support levels. Additionally, also the coal price decrease settled. At the weekly level the closest annual contract was slightly lower, but the following two annual contracts closed slightly higher at the weekly level.

SPOT MARKET

Last week the spot prices decreased. Downward pressure to spot prices was caused by higher temperatures and rainy weather. Due to wet weather the inflows increased strongly at the end of the week. In addition, the wind power production was mainly higher than normal. Also in Finland the wind power production was higher than normal except for the beginning of the week. Finnish area price realized close to Swedish area prices at the weekly level and therefore the Finnish area price realized lower than system price.

EMISSIONS

Last week the emission price continued decreasing. Downward pressure in emission price was maintained by weak gas price and the continuous weak development at the electricity market. The political uncertainty remained high, when the Brexit negotiations continued.

| Indicator | ENOFUTBLQ2-19 | ENOYR-20 |
|-----------------------|---------------|----------|
| Coal-fired production | 5 % | 5 % |
| Coal price | 5 % | 5 % |
| Gas price (NBP) | 1 % | 2 % |
| German price level | 2 % | 3 % |
| Spot | 48 % | 36 % |
| Crude oil Brent | 62 % | 46 % |
| Water reservoirs | 0 % | 2 % |
| EUR/USD FX rate | 2 % | 1 % |
| Temperature | 8 % | 5 % |
| Precipitation | 16 % | 13 % |

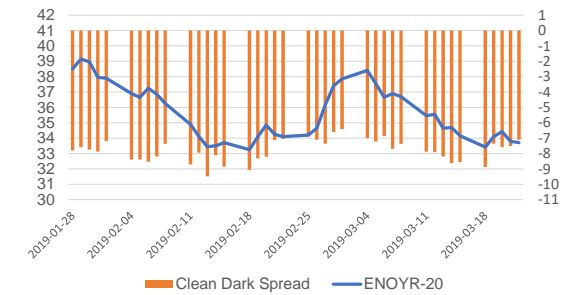
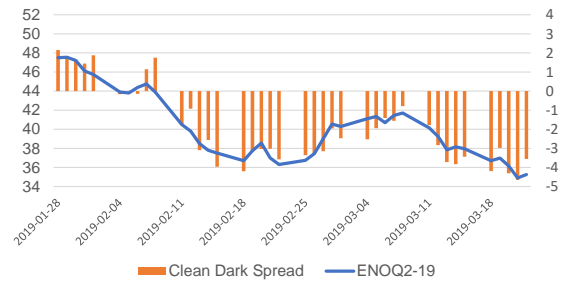
Definition
The above figures measure the ability of market determinants to describe the price changes occurred in last 6 months. The affect is measured as Coefficient of Determination*. Each variable is evaluated independently. We use a color scale to demonstrate efficacy, green (strong), yellow (moderate),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

| Forecast history | 12 | Chg | 11 | Chg |
|------------------|----|-------|----|-------|
| ENOFUTBLQ2-19 | ⬇️ | -7.1% | ⬇️ | -9.0% |
| ENOYR-20 | ⬇️ | -1.3% | ⬇️ | -6.9% |
| NP System | ⬇️ | -4.5% | ⬆️ | 3.4% |
| NEDEC9 | ⬇️ | -8.1% | ⬇️ | -2.3% |

DETERMINANTS AFFECTING THE MARKET ON WEEK 13

RESTRICTIONS IN PRODUCTION AND TRANSMISSION CAPACITY

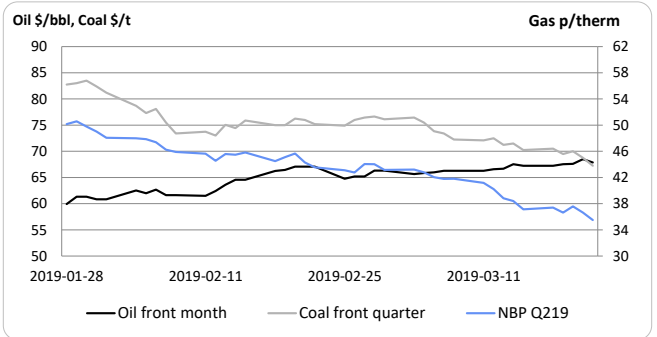
- Oskarshamn 3 (1400 MW), test 30.3.2019, available 650 MW
- Ringhals 2 (904 MW), failure 27.12.-30.4.2019, available 452 MW
- Ringhals 3 (1063 MW), maintenance 5.3.-30.4.2019 available 770 MW
- SE3 - FI (1200 MW), maintenance 30.-31.3.2019, available 0 MW
- Nordic nuclear power plants are currently operating at 94%
- RU-FI transfer profile varies due to capacity charges, on average imports from Russia last week were 69 % of the maximum.



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 | 47.52 |
| NP Area FI - NP System | 5.50 | 3.10 | 6.40 | 8.70 | 5.54 | 3.78 | 2.81 | 0.98 |
| NP Area SE1 - NP System | 0.50 | 1.10 | 1.80 | 0.20 | 2.04 | 1.43 | 0.24 | -0.62 |
| NP Area SE2 - NP System | 0.60 | 1.10 | 1.80 | 1.00 | 2.04 | 1.43 | 0.24 | -0.62 |
| NP Area SE3 - NP System | 1.10 | 1.40 | 2.00 | 1.00 | 2.33 | 1.83 | 0.55 | -0.16 |
| NP Area SE4 - NP System | 3.00 | 1.80 | 2.30 | 1.90 | 2.62 | 2.77 | 2.37 | 0.23 |

*Average for period between 1.1.2019-25.3.2019.



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Source for data: intStream, Tilastokeskus

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