

NORDIC ELECTRICITY MARKET

25.11.2019 Toni Sjöblom, Gasum Portfolio Services Oy

WE EXPECT A SLIGHTLY BEARISH MARKET

Forecast to week 48:

| | |
|---------------|-----------------|
| ENOFUTBLQ1-20 | 📉 Bearish (<0%) |
| ENOYR-20 | 📉 Bearish (<0%) |
| NP System | 📈 Bullish (>0%) |
| NEDEC9 | 📉 Bearish (<0%) |

FORECAST TO WEEK 48

ELECTRICITY DERIVATIVES

Front quarter

For this week ahead, the weather will be drier than normal, but next week will see precipitation rates rise above the normal level. On the whole over the two-week forecast period, precipitation rates will be very close to normal and the hydro balance will remain unchanged. Temperatures will take a downturn on Wednesday and remain clearly below normal from the end of this week until the middle of next week but will then return close to normal again. We expect quarterly products to fall as the colder and drier period appears to end.

Annual products

The change towards rainier and warmer weather in the end period of the forecast also softens annual product prices. In the fuel markets, oil, coal and emission allowances were rising last week, which was also reflected in German and Nordic electricity. We expect the rise to calm in emission allowances and the German electricity market this week. Of course there is a week-long cold period in Central Europe, too, which will probably prevent any major downtrend. We expect a slight fall in annual product prices.

SPOT MARKET

In the first days of the week, Nordic wind power production will be very low. The dry weather has also caused a downturn in flow rates, which are clearly below normal. Temperatures will be above normal for the first days of the week but will take a downturn on Wednesday, falling clearly below normal for the rest of the week and increasing consumption slightly. We expect the system price to rise clearly at the weekly level. In Finland, wind power production will be very low on Tuesday and Wednesday. We expect the Finnish area price to rise, too, and to settle above the system price.

EMISSIONS

Emission allowance prices have been rather weak for a long time and it appears that last week's rise will not continue directly into this week. European weather forecasts are also showing milder conditions again after the week's colder period. We expect emission allowance prices to calm after last week's rise.

Market signals

| | spot | Q1-20 | 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) |
|---------------|------------|-------|-------|-----------|
| ENOFUTBLQ1-20 | 22.11.2019 | 43.80 | 2.9% | 1.25 |
| ENOFUTBLQ2-20 | 22.11.2019 | 36.00 | 1.8% | 0.65 |
| ENOFUTBLQ3-20 | 22.11.2019 | 33.20 | 1.7% | 0.55 |
| ENOFUTBLQ4-20 | 22.11.2019 | 38.40 | 1.1% | 0.40 |
| ENOYR-20 | 22.11.2019 | 37.81 | 1.8% | 0.66 |
| ENOYR-21 | 22.11.2019 | 34.75 | 1.3% | 0.44 |
| ENOYR-22 | 22.11.2019 | 33.15 | 1.2% | 0.38 |
| ENOYR-23 | 22.11.2019 | 32.90 | 0.7% | 0.22 |
| ENOYR-24 | 22.11.2019 | 32.18 | -0.3% | -0.10 |
| NEDEC9 | 22.11.2019 | 24.56 | 3.0% | 0.72 |
| NEDEC20 | 22.11.2019 | 24.70 | 3.0% | 0.71 |

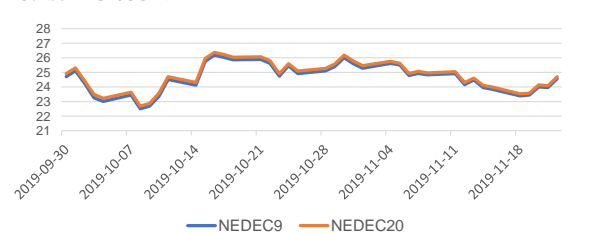
EPAD settlements

| 22.11.2019 (€/MWh) | 2020 | 2021 | 2022 | 2023 |
|--------------------|-------|-------|-------|-------|
| SYHEL | 6.50 | 4.08 | 3.43 | 3.75 |
| SE1-NP System | -0.75 | -1.50 | -2.25 | -2.25 |
| SE2 - NP System | -0.75 | -1.50 | -2.25 | -2.25 |
| SE3 - NP System | 1.30 | 1.25 | 1.35 | 1.35 |
| SE4 - NP System | 3.25 | 2.60 | 2.60 | 2.60 |

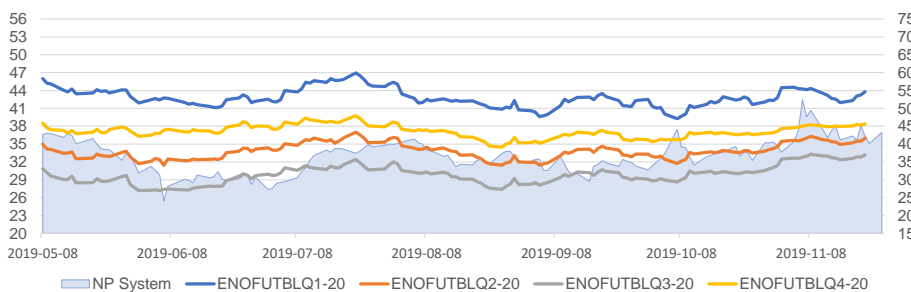
Week's spot price change

| Price area (€/MWh) | Date | Value | % chg | Chg (EUR) |
|--------------------|------------|-------|-------|-----------|
| NP System | 24.11.2019 | 40.97 | -2.8% | -1.19 |
| NP Area FI | 24.11.2019 | 43.20 | -5.6% | -2.59 |
| NP Area SE1 | 24.11.2019 | 40.19 | -2.1% | -0.86 |
| NP Area SE2 | 24.11.2019 | 40.19 | -2.1% | -0.86 |
| NP Area SE3 | 24.11.2019 | 40.30 | -5.4% | -2.29 |
| NP Area SE4 | 24.11.2019 | 40.30 | -5.4% | -2.29 |

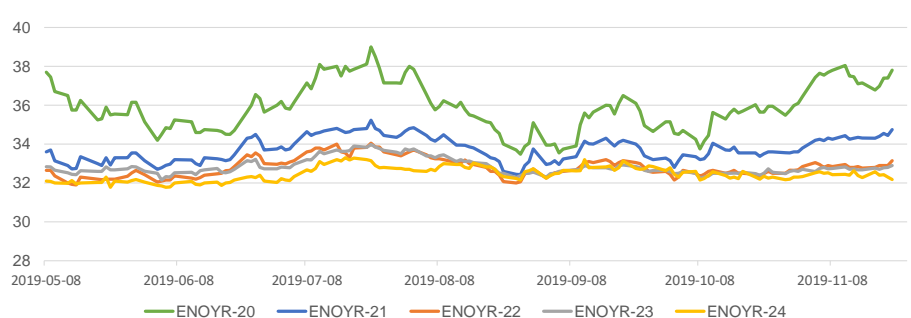
Carbon EUR/CO2 t



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



Years EUR/MWh



COMMENTS ON WEEK 47

ELECTRICITY DERIVATIVES

Front quarter

Last week, quarterly products were bearish on Monday as the weather forecasts had still in the first days of the week been rainier than normal for the current week and the temperature forecast was mild. On Tuesday, the market still opened bearish, but the prices turned bullish during the day. Towards the end of the week, quarterly product prices took a clearer upturn: although the weather forecasts were still for rainier conditions on Wednesday, the temperature forecast got colder and towards the end of the week the rain forecasts dried up, too. Emission allowance and coal prices also climbed in the first days of the week. At the weekly level, the front products ended up clearly on an upward trajectory.

Annual products

Last week, the front-year product opened bearish due to emission allowances, coal and the wetter-than-normal weather forecasts. Annual products did, however, take an upturn right after Monday in the wake of emission allowances and coal. The strong coal annual product support level at USD 62 was still not broken. There were no significant changes in coal-fired profit margins at the weekly level.

SPOT MARKET

Last week, Nordic wind power production was close to the normal level but weakened from Wednesday onwards. Towards the end of the week, wind output rose again. Due to milder weather and precipitation rates that turned out to be slightly above normal, flow rates increased from a low to the normal level. Imports from Russia increased for Thursday and Friday from the low level seen in the first days of the week. The system price dropped at the weekly level due to milder weather. Finnish wind power production increased clearly after Monday's low level but calmed again for the rest of the week. The Finnish area price also dropped clearly due to milder weather and high wind power production. At the weekend, the Finnish area price settled slightly below the system price. At the weekly level the area price difference decreased and turned out to be around €2.2/MWh.

EMISSIONS

Last week, emission allowance prices opened bearish on Monday and also took a momentary dip on Tuesday as the lowest trading was below the €23.2/t level. During the rest of the week, emission allowance prices turned bullish and closed on Friday at around €24.6/t, i.e. up almost one euro at the weekly level. The price hike was attributed to the weather having turned colder in Europe over the week, which also pushed fuel prices up.

| Indicator | ENOFUTBLQ1-20 | ENOYR-20 |
|-----------------------|---------------|----------|
| Coal-fired production | 35 % | 21 % |
| Coal price | 9 % | 3 % |
| Gas price (NBP) | 7 % | 0 % |
| German price level | 17 % | 32 % |
| Spot | 7 % | 18 % |
| Crude oil Brent | 25 % | 17 % |
| Water reservoirs | 0 % | 1 % |
| EUR/USD FX rate | 8 % | 3 % |
| 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)

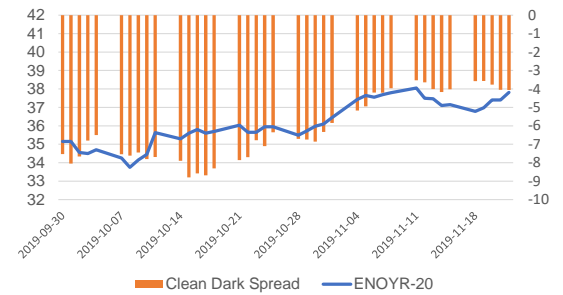
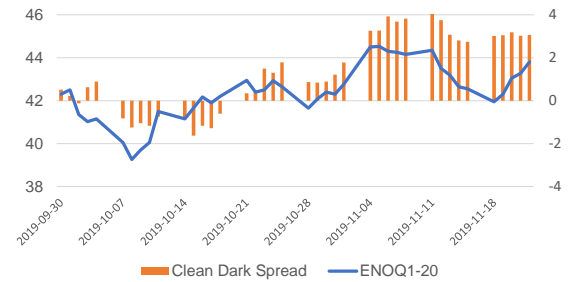
| Forecast history | 47 | Chg | 46 | Chg |
|------------------|----|-------|----|--------|
| ENOFUTBLQ1-20 | ↘ | 2.9% | ↗ | -3.6% |
| ENOYR-20 | ↘ | 1.8% | ↗ | -1.7% |
| NP System | ↻ | -2.8% | ↘ | -16.8% |
| NEDEC9 | ↘ | 3.0% | ↗ | -4.0% |

DETERMINANTS AFFECTING THE MARKET ON WEEK 48

RESTRICTIONS IN PRODUCTION AND TRANSMISSION CAPACITY

Ringhals 2 (852 MW), maintenance 7.9.-30.12.2019, in use 300 MW

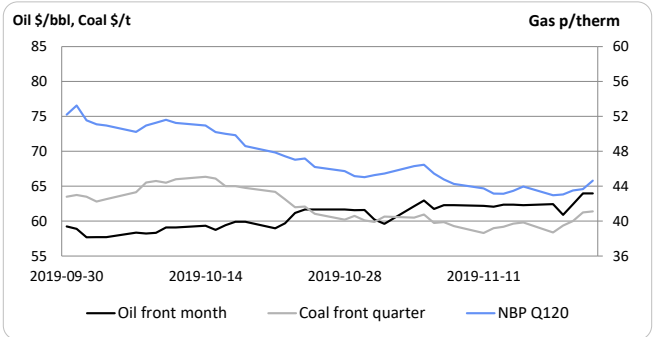
- Nordic nuclear power plants are currently operating at a capacity utilization rate of 95%
- RU-FI transmission profile varies due to capacity payments, average imports from Russia last week were 56% of the maximum



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 | 39.10 |
| NP Area FI - NP System | 5.50 | 3.10 | 6.40 | 8.70 | 5.54 | 3.78 | 2.81 | 5.43 |
| NP Area SE1 - NP System | 0.50 | 1.10 | 1.80 | 0.20 | 2.04 | 1.43 | 0.24 | -0.94 |
| NP Area SE2 - NP System | 0.60 | 1.10 | 1.80 | 1.00 | 2.04 | 1.43 | 0.24 | -0.94 |
| 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 | 0.97 |

*Average for period between 1.1.2019-25.11.2019.



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Source for data: intStream, Tilastokeskus

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