



Operational experience

5TH OF FEBRUARY 2025
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Agenda



Why is good information key to optimal use of hydro resources in the Nordic market?



Use of information in the NTC world – which we now miss with FBMC



UMM - example from short-term forecasting after go-live



Impact on production optimization and bidding in reserve markets



Concluding remarks on information needs

Good information about what impacts the **future value** of the water is key for optimal use of the hydro power resource



*To optimize the hydropower resources of Statkraft and society we need good price and weather forecasts for tomorrow and up to **five years a head***



WHY

Because the hydropower resource can be stored – depending on the size of the reservoir the alternative value of the water can be the price from producing tomorrow or waiting for later



Different reservoirs may have different water values

Examples

RESERVOIR 1

Small reservoir + high reservoir level

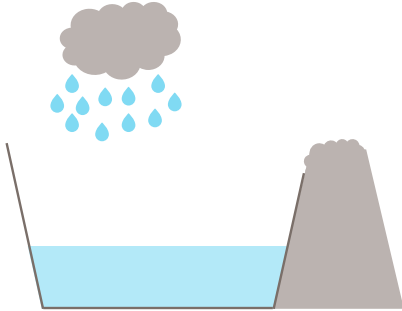


Risk of overflow if we don't produce now – spilled water gives no income

➔ Low water value

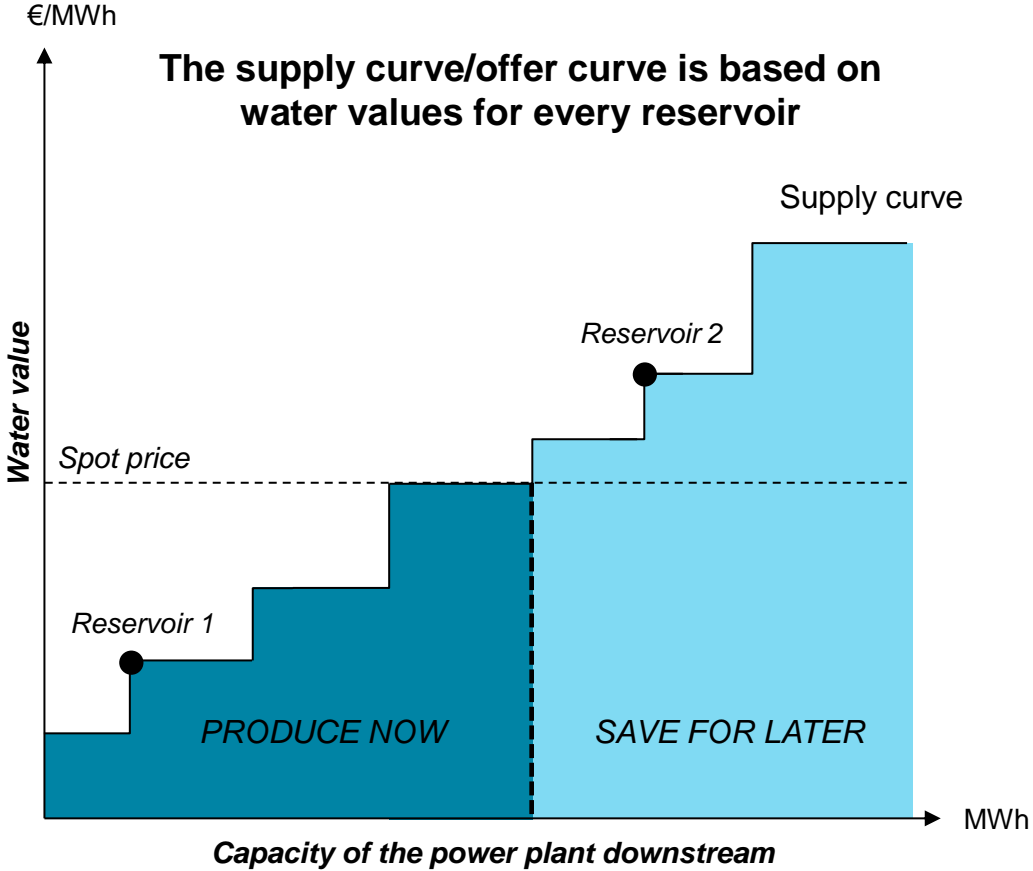
RESERVOIR 2

Large reservoir + low reservoir level



Able to save the water without the risk of overflow in expectancy of a period with high prices

➔ High water value

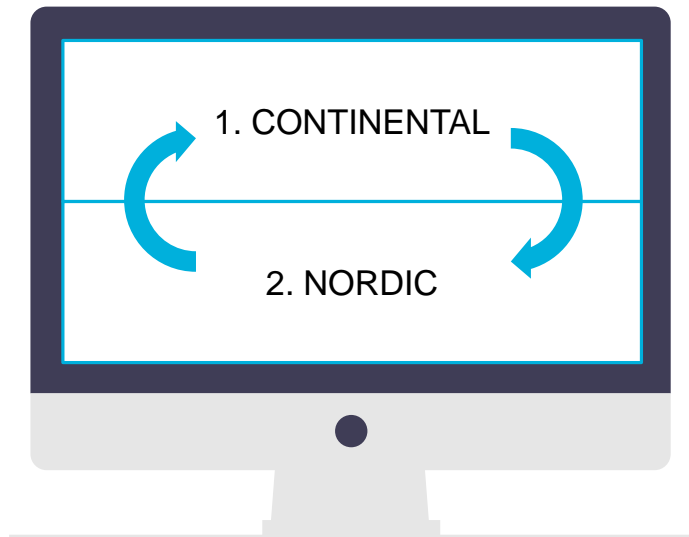


We use our market models to produce important forecasts for prices, production and power flow

INPUT

- » Demand
- » Production from wind, solar, hydro (intermittent)
- » Production capacity from coal, nuclear, stored water (dispatchable)
- » Availability on power stations in Europe
- » Transmission
- » Fuel prices
- » Inflow

MARKET MODELS



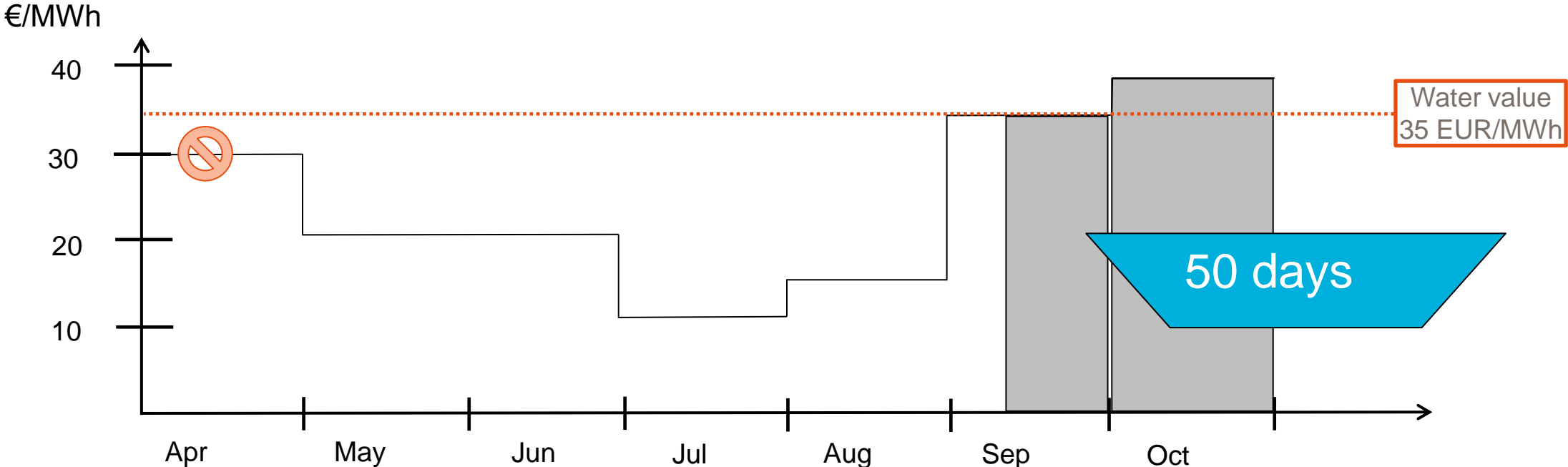
OUTPUT

- » Price forecasts short and long term
- » Production forecasts for different power stations in Europe
- » Power flow between countries

Information and input along the whole dispatch horizon is crucial for optimal dispatch of the hydro resource

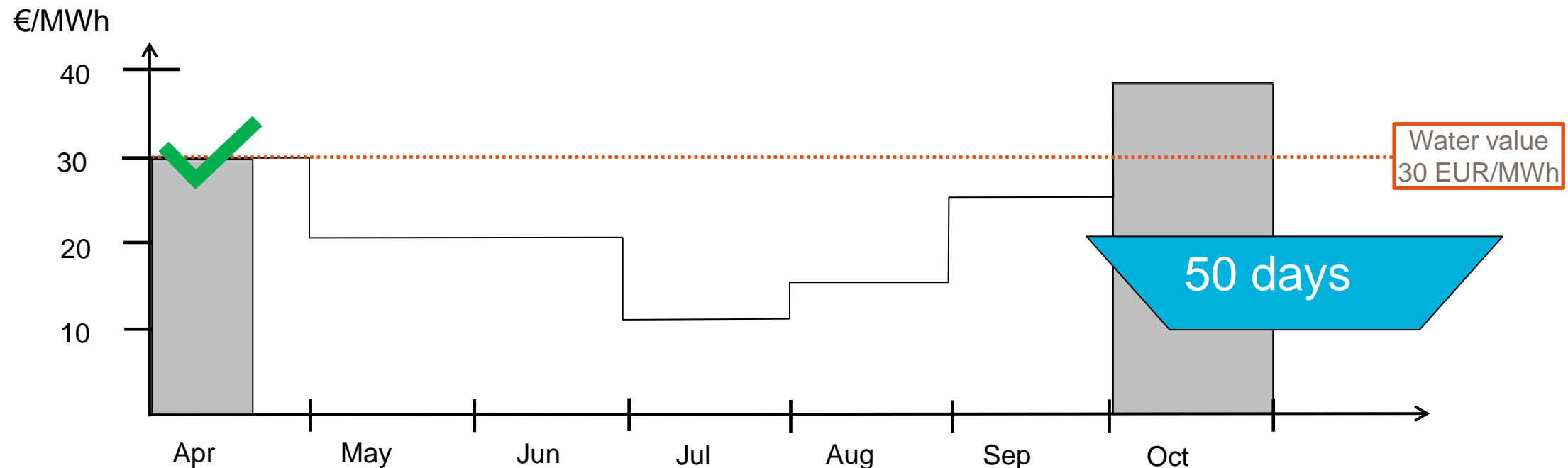
Simplified case: Find the best use of the water resource – the water value

- Water for 50 days full production: reservoir content + expected inflow from April – October, can be freely distributed throughout the period
- Expect low demand and prices during summer
- What is the water value? (30 days / month)
- Do you want to sell your water now at 30 €/MWh?



Updated forecast: Price lowered in September due to work on the transmission line – lower exports

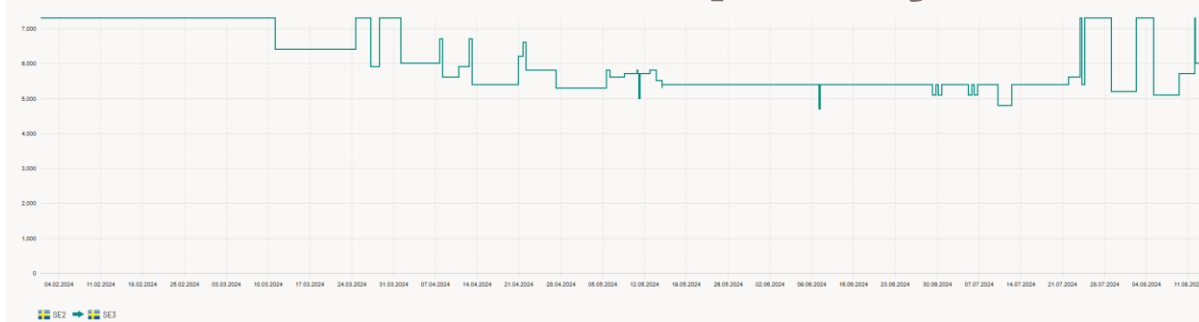
- Analyst: New UMM about work on the transmission line lowers the price forecast for September.
- What is your new water value?
- Do you want to sell your water now at 30 €/MWh?



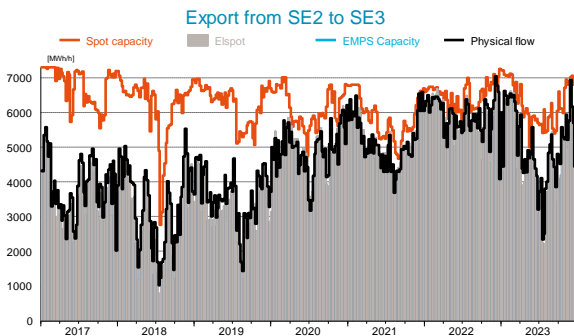
Use of information in the NTC world – which we now miss with FBMC

In the NTC world there were meaningful sources of information to make capacity forecasts – now missing

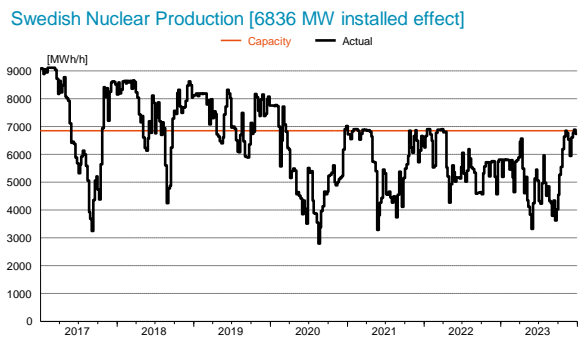
NUCS information



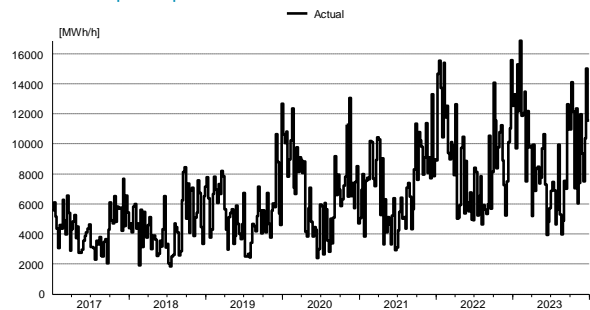
Historical NTC capacities



Scenario dependent capacity modelling



Wind power production in the Nordic countries



- NUCS messages in NTC terms practically useless w/FBMC
- Anticipate the results from the LTCC and NUCS project, however worried information will quickly turn outdated
 - And a form of NTC information would still be in need
- Value of EPR results limited for analysis purposes, and so far, also limited experience to base future forecasts on
- Anonymized Swedish CNE/CNECs add another layer of challenges and makes learning from history very difficult

UMM - example

SHORT-TERM FORECASTING AFTER GO-LIVE

UMM

| Published | Event Start | Event Stop | Duration | Type of Unavailability | Reason Code | Reason for the Unavailability | Remarks |
|---------------------|-----------------------|---------------------|-------------------|------------------------|----------------------|-------------------------------|---------|
| 2024-11-08T13:57:11 | from 2024-11-18T08:00 | to 2024-11-22T16:00 | 4 days 8 hours | Planned | Foreseen maintenance | Temperature upgrade of line. | |

Transmission Units

| Unit Name | Unit EIC | Area | Installed Capacity | Available Capacity | Unavailable Capacity | Fuel Type | Power Feed-In | From | To |
|-----------|----------|---|--------------------|--------------------|----------------------|-----------|---------------|------------------|------------------|
| N05 → N01 | |  N05 →  N01 | 3900 MW | 3300 MW | 600 MW | | | 2024-11-18T08:00 | 2024-11-22T16:00 |

Assets

50TL00000001168C : 420AURLAND_3-HOL_1

Market Participants

Publisher
Statnett SF

Related Messages

2024-11-21T19:11
2024-11-08T13:57 (currently viewing)

Messages from the same connection(s)

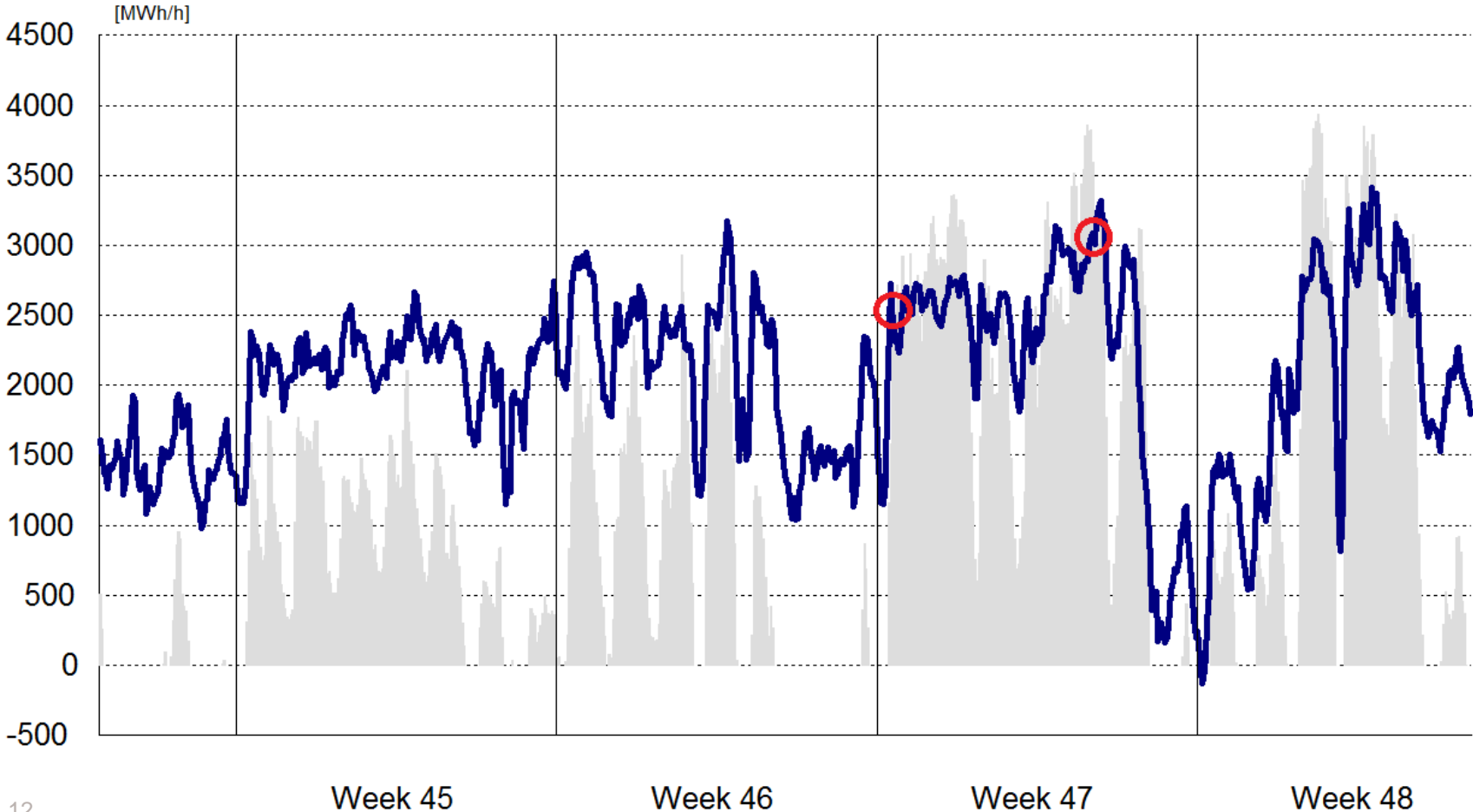
Planned, Foreseen maintenance: 2025-01-30T09:13
from 2025-02-18T08:00 to 2025-02-19T15:00

Nord Pool - UMM Platform

Flow

Import to NO1 from NO5

■ Elspot — Physical flow



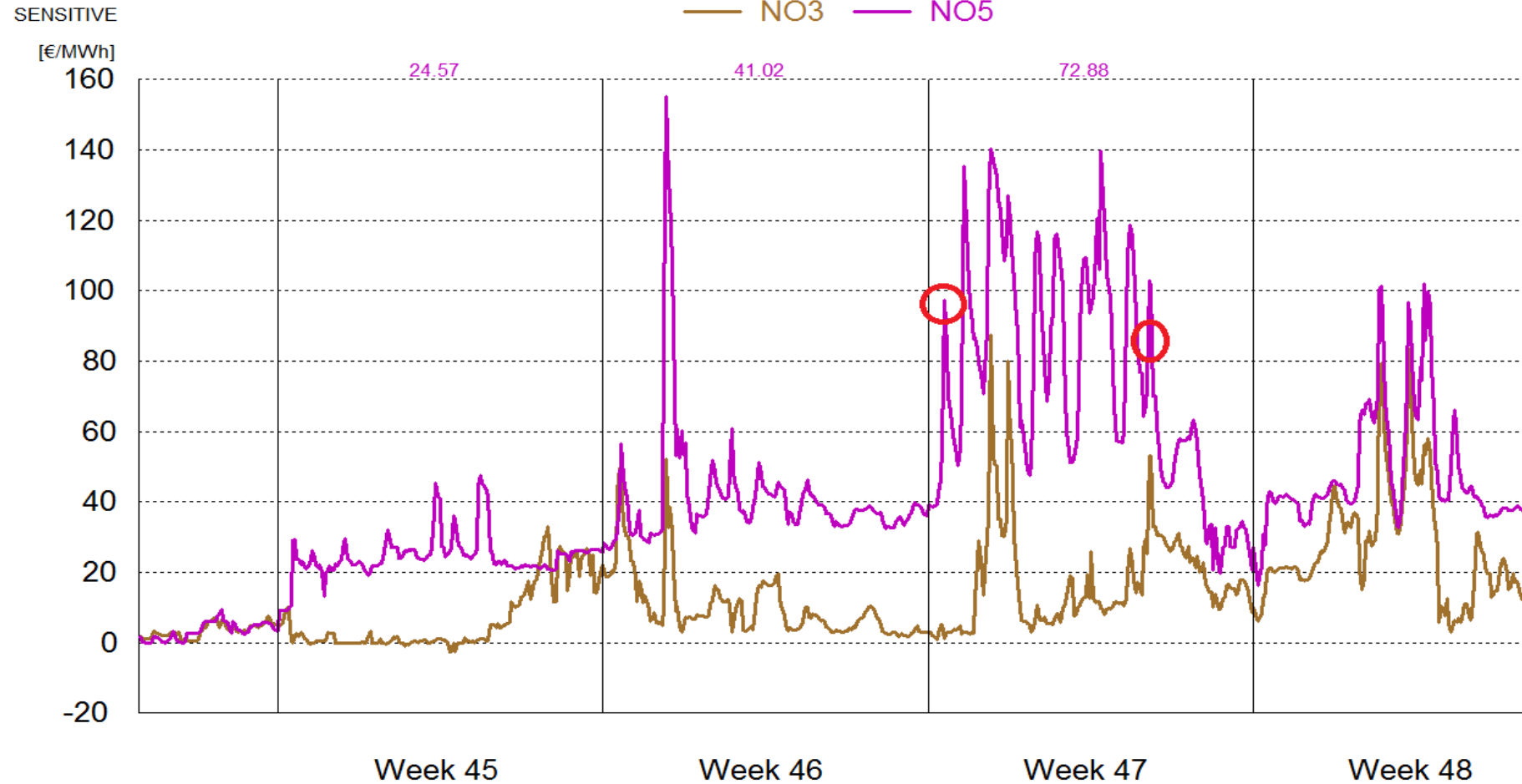
CNEC

| | | | | |
|------------------------|--|----------|---|---|
| 2024-11-18 08:00:00 | L1034_325.437 65% 420 Aurland 1- Usta + 65% 420 Aurland1-Sima + 300 Sogndal-Hove | STATNETT | 300HOVE-SOGNDAL - Terminal: 300HOVE-SOGNDAL_T2 | Contingency S 420 Aurland 1-Usta + S 420 Sima-Aurland1 |
|------------------------|--|----------|---|---|

- Appears when the UMM starts, and disappears when the UMM ends
- Strongly restricts the problem throughout the whole period
- Causes a price difference between southern Norway and the other areas

Spot price

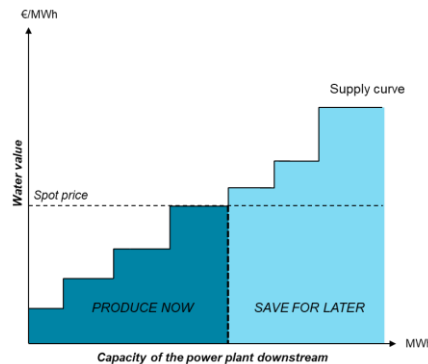
Spot price NO5, NO3



Impact on value

DISPATCH CENTRE

Main take-away from experience since go-live: optimal use of the hydropower resource is more challenging



More challenging to make price and production forecasts (everything else equal)

Optimal use of the hydro resource becomes more difficult (wrongly positioned in the reservoirs)

Bidding in reserve markets requires a higher risk premium (with less information available)

Information needs

ROUND OF REFLECTIONS



Burning need for information to continue optimizing the hydropower resource as before

- In the short-term we ask for:
 - **PTDF** and **RAM** values from RCC for the **next 10 days**
 - Static **grid model** for the Nordic market area
 - **UMMs** connected to elements in the grid model



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