

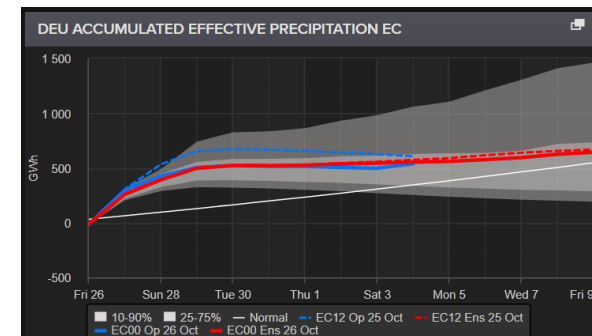
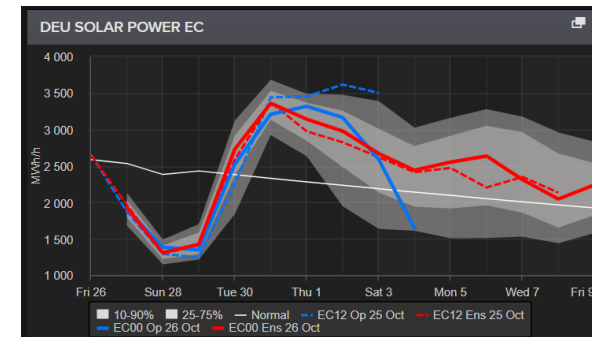
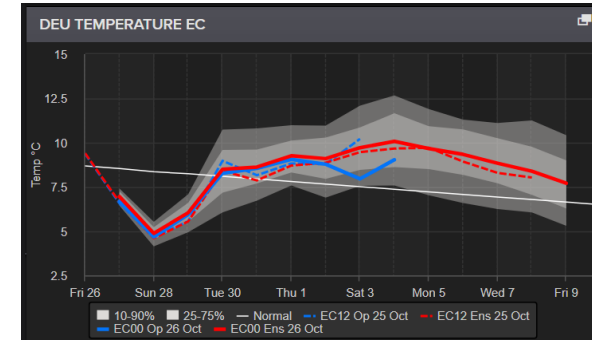
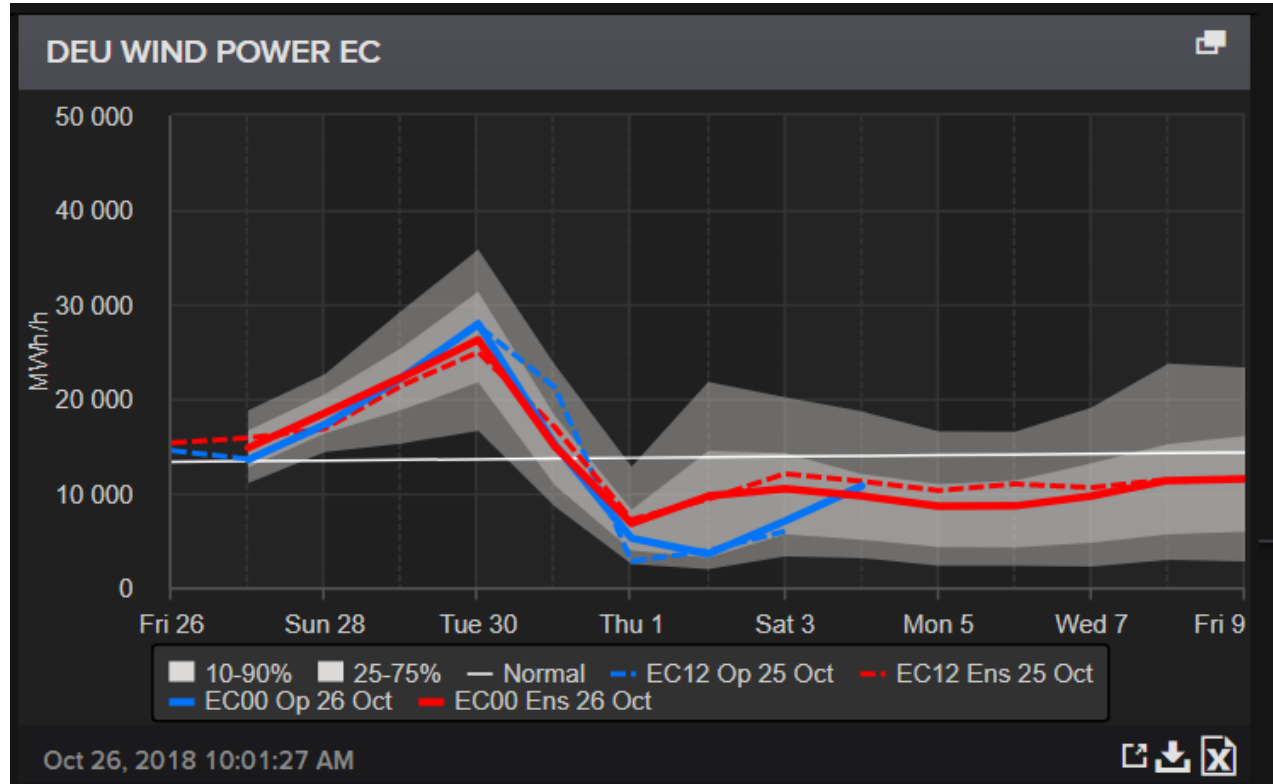


Danske
Commodities

WHAT IS NORMAL IN A WORLD OF CHANGE ?

Use of the term “meteorological normal” in energy trading

In power trading everything compares to normal



Normal to what ?

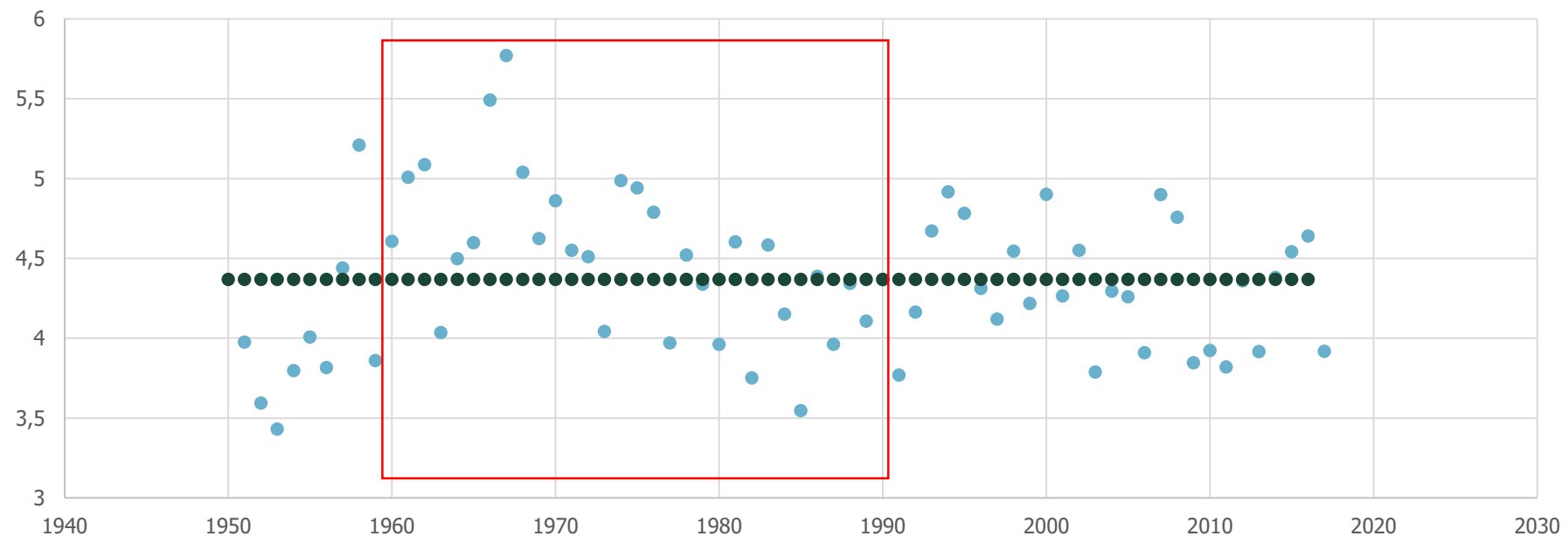
Commercial providers of weather data use latest 20 – 30 years (Refinitiv, Bloomberg, etc.)

- Updating every 5 years (next update 2020)

Official sources use 1961 – 1990 (defined by WMO)

- Next update 2020 to 1991-2020

Hamburg 10m wind yearly winter average (NDJFM)



Impact on long term contracts



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POWER PURCHASE AGREEMENTS

As a leading European energy trader with 5000 MW of renewable energy under management, we support renewable asset owners with competitive solutions that manage their risk and lower their costs, while meeting the needs of their investors and banking partners.

HIGHLY COMPETITIVE PPAs

The growing share of renewable energy creates new types of risks and opportunities for participants in the energy market. Danske Commodities offers attractive Power Purchase Agreements (PPAs) on both standard fixed or floating prices and individually structured settlements. We build lasting relationships with our customers, and offer contracts from one to 15 years.

We understand that flexibility is the key to success and that is why our team is available to assist you from the beginning to the end of the PPA process.

Price of a PPA – Power Purchase Agreement

Simplified calculation of the price of a PPA:

$$\text{Expected Normal} + \text{Expected Risk} = \text{Price}$$

Risk

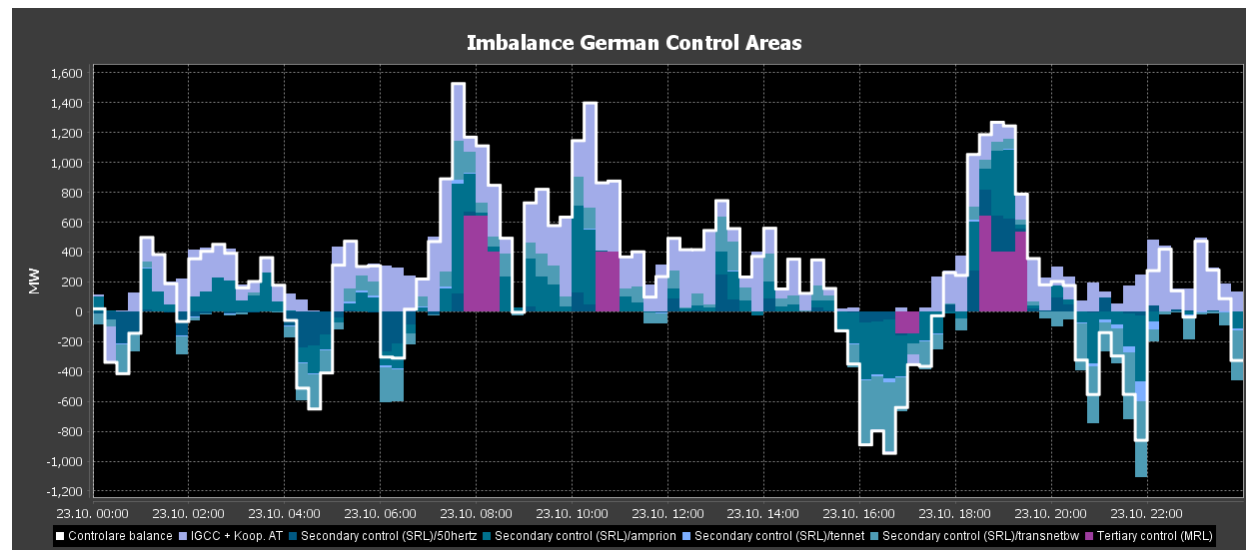
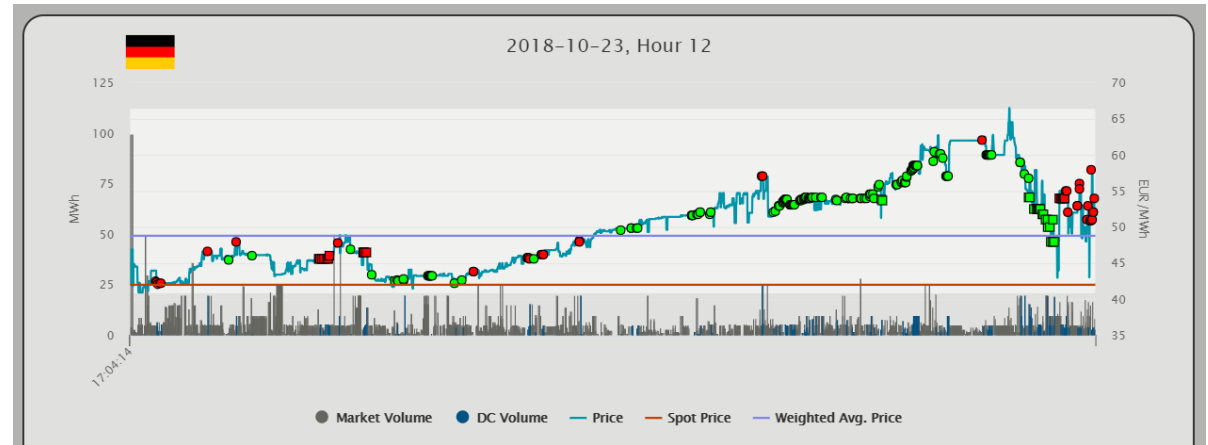
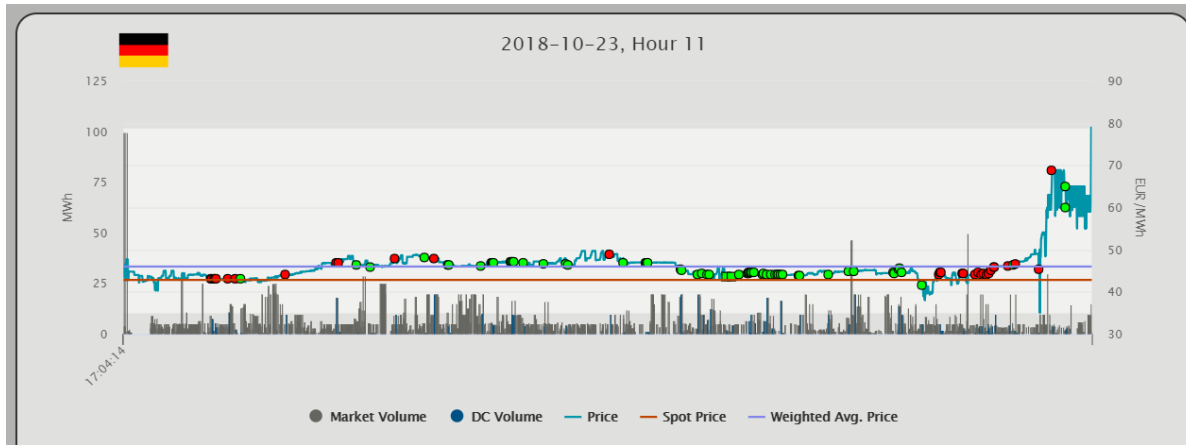
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Weather related risk:

- Changes from current normal
- Enhanced volatility due to convection
- Cuts storm
- Cuts TSO

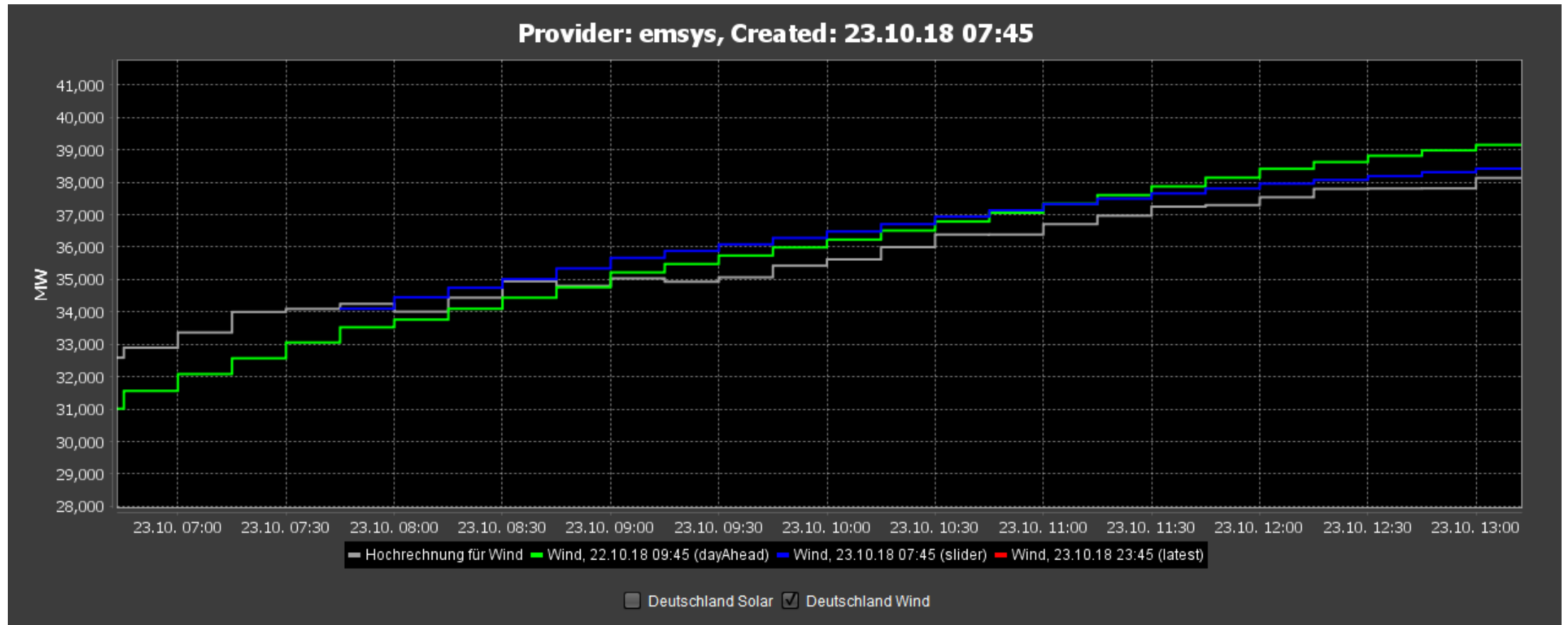
Case, Germany October 23, 2018

German power price:



Case, Germany October 23, 2018

German wind – Forecasted vs. Delivered:



Effects from the expected climate changes

EFFECTS FROM CLIMATE CHANGE

- Enhanced convection
- More extreme scenarios
- More/less wind on average?
- Change in temperature, water level, etc.

MARKET EFFECT

- Lower quality of forecasts due to additional convective influence
- Lower wind power production due to TSO-cuts
- Lower wind power production due to Storm force winds (storm cuts)
- All changes means enhanced risk

COMMERCIAL EFFECT

- Price of power rising due to the need of flexibility (conventional power production)
- Price of Power Purchase Agreements rising due to enhanced risk



**Challenge.
Compete.
Repeat.**

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