

Visions for future forecasts at Energinet.dk

Gitte Agersbæk

Energinet.dk



Agenda

- Why do forecasting
- Status for forecasting at Energinet.dk
 - Wind power
 - Other forecasts (Demand, exchange on interconnectors, PV eg)
- Utilization of forecasts
- Future forecasting
 - Wind power
 - PV
 - Other forecasts (Demand, exchange on interconnectors eg)
- Cooperation between TSO's

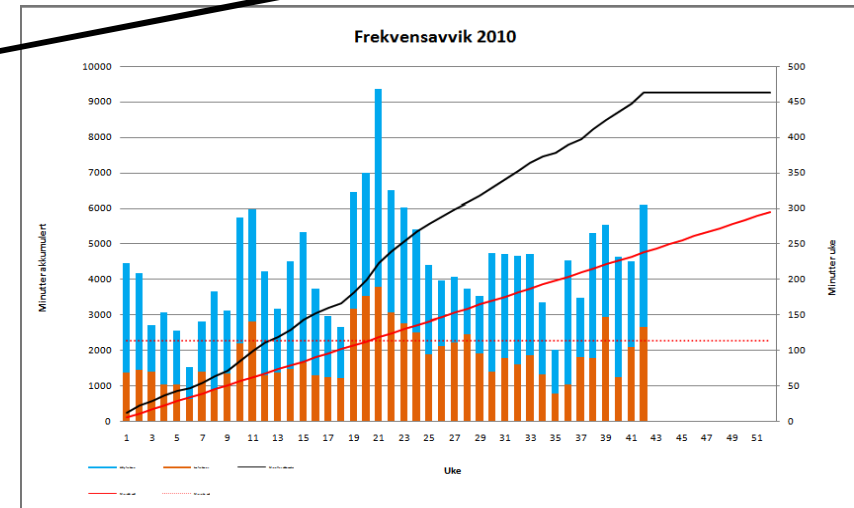


Why do forecasting ?

- To use in sales
 - Sending bids to the power exchange
 - Bilateral trades
- Use the grid more comprehensive
- Balance management
 - Using control actions
 - React on frequency or **Area Control Error**
 - Using automatic reserves
 - Being proactive
 - Predicting imbalances
 - Using manual reserves og market bids



Why balance management?



- To reduce Risk of Disturbances
- To provide the society with a stable power supply
- To use all resources as good as possible



Status for forecasting at Energinet.dk

- Wind power

	Kombineret
mae [%]	5.6322
rmse [%]	7.9856
bias [MWh]	-34.1120

- Other forecasts (Demand, exchange on interconnectors, PV eg)

Demand

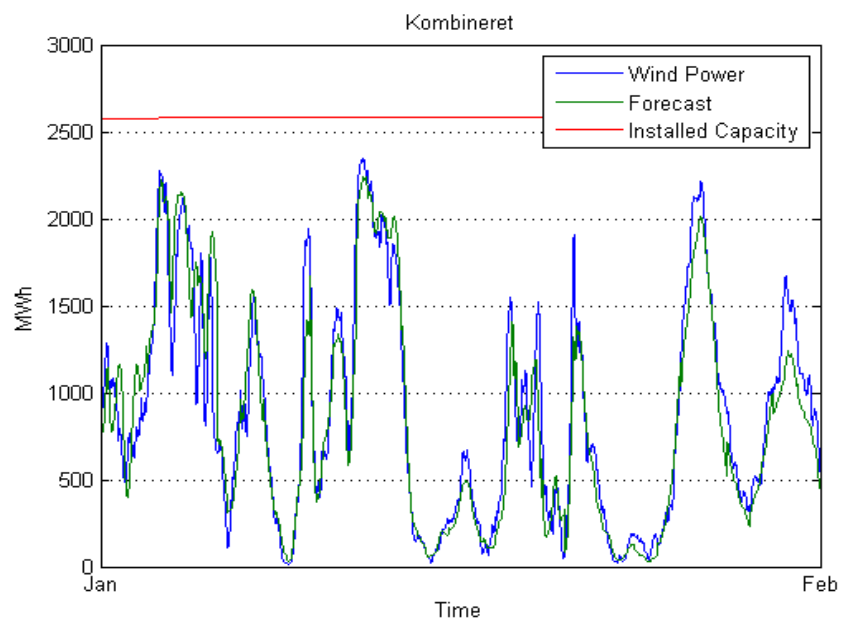
mae [MWh]	93.2481
rmse [MWh]	117.6084
mape [%]	3.6987
bias [MWh]	72.9786

exchange on interconnectors

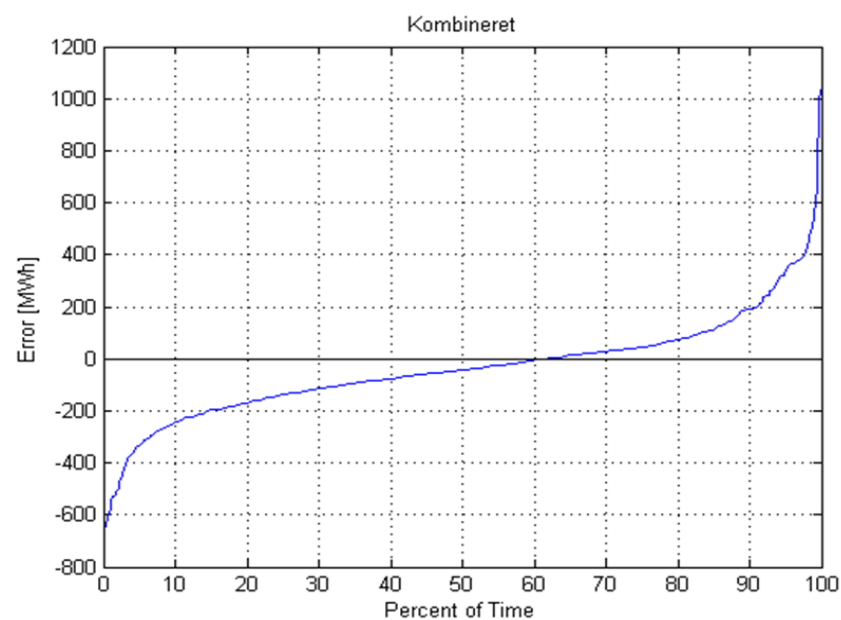
mae [MWh]	218.8125
rmse [MWh]	266.2974
bias [MWh]	14.9778



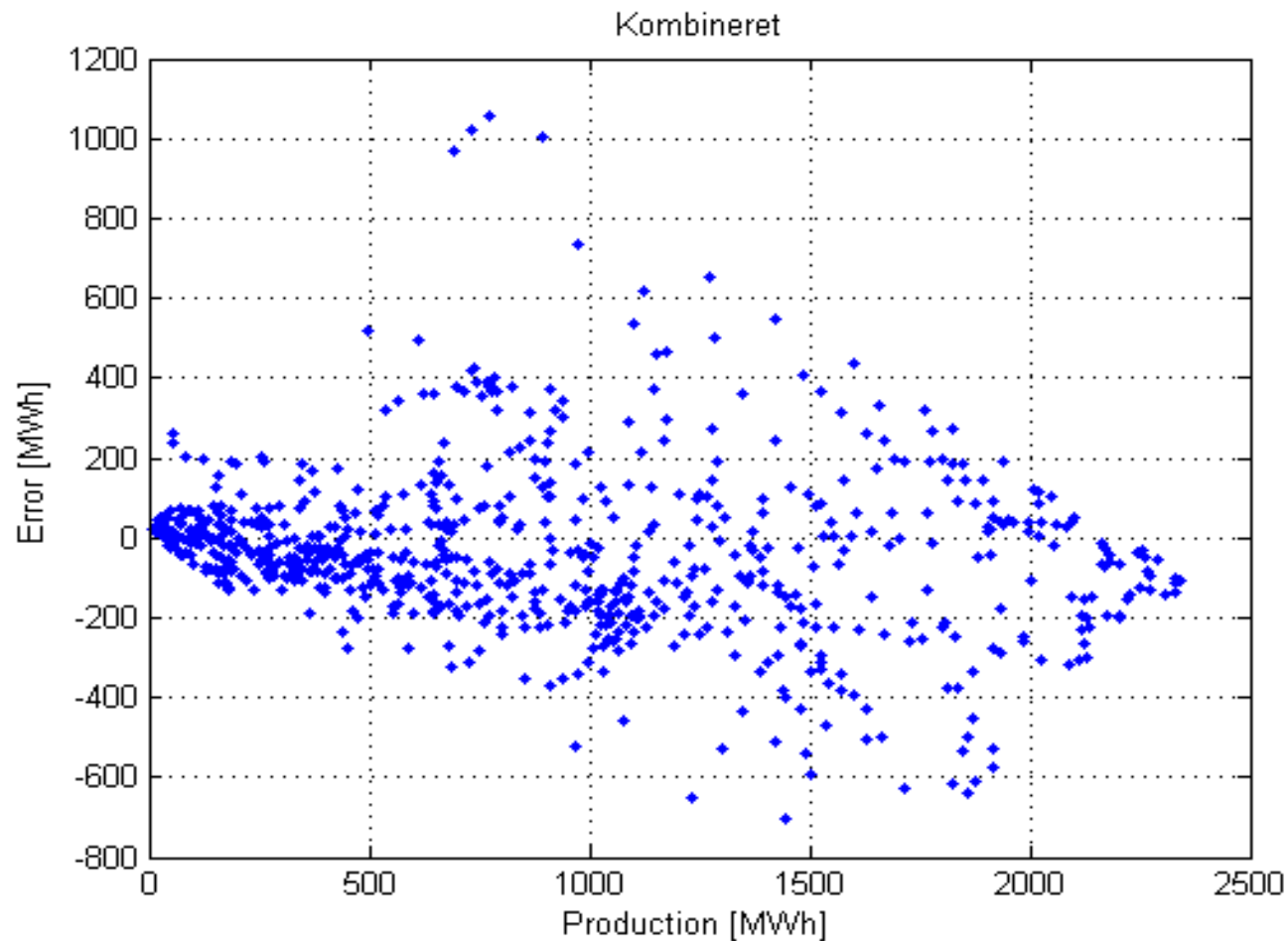
Wind forecast January 2012, onshore



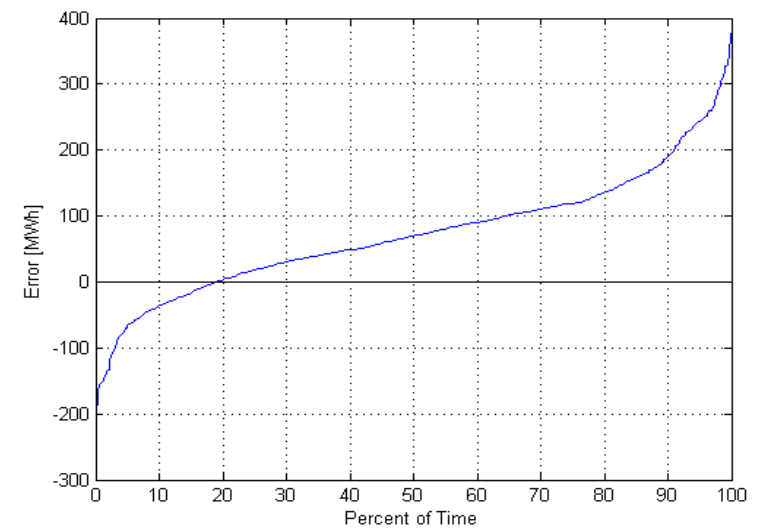
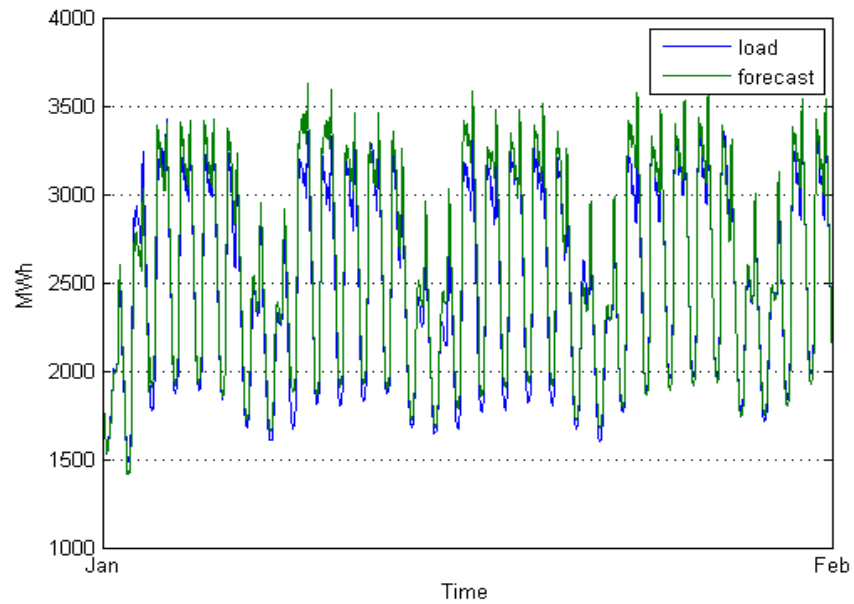
Duration curve Error



A trend to under estimate with high wind

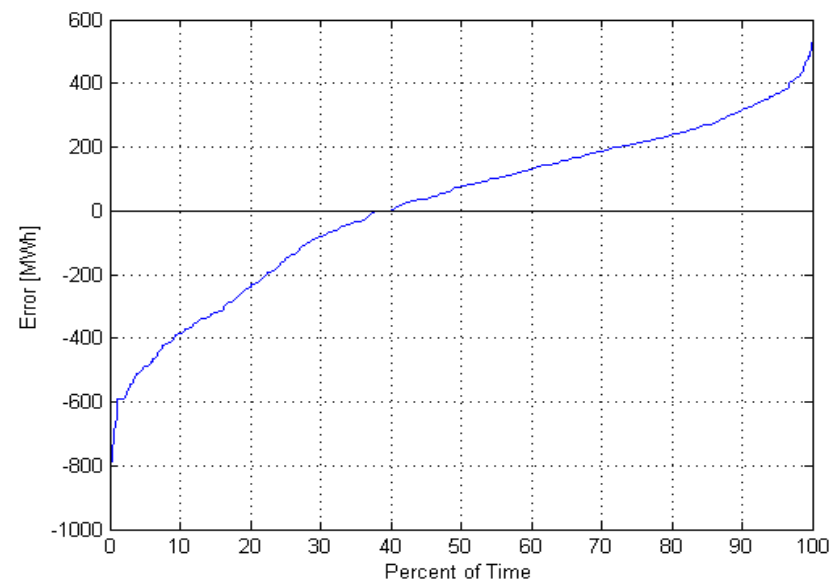
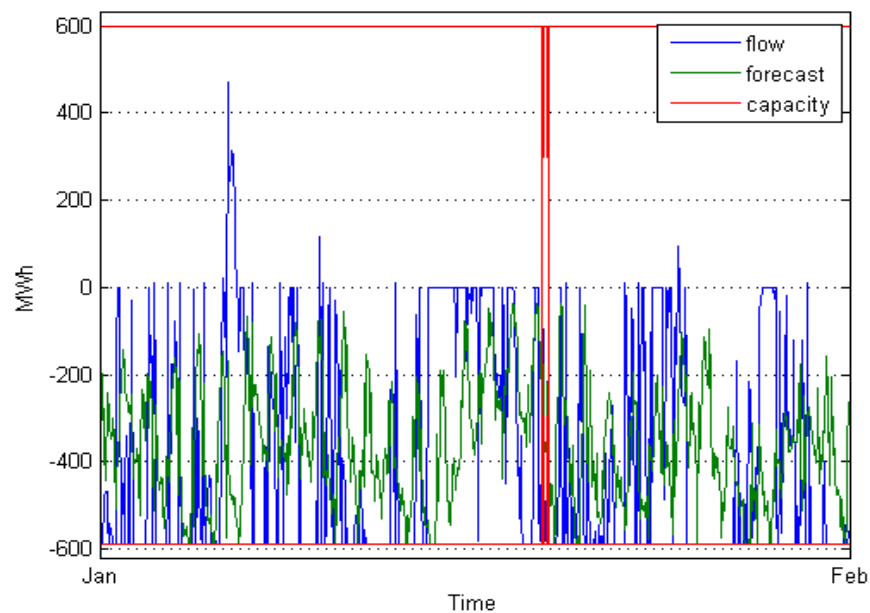


Demand





Exchange on Interconnectors DK1-DK2



Predicting balance

Balance = Demand + Wind Power + CHP + Conventional Power + Exchange,

- Demand is negative
- Production is positive
- Exchange is calculated with sign
 - import is positive
 - export is negative

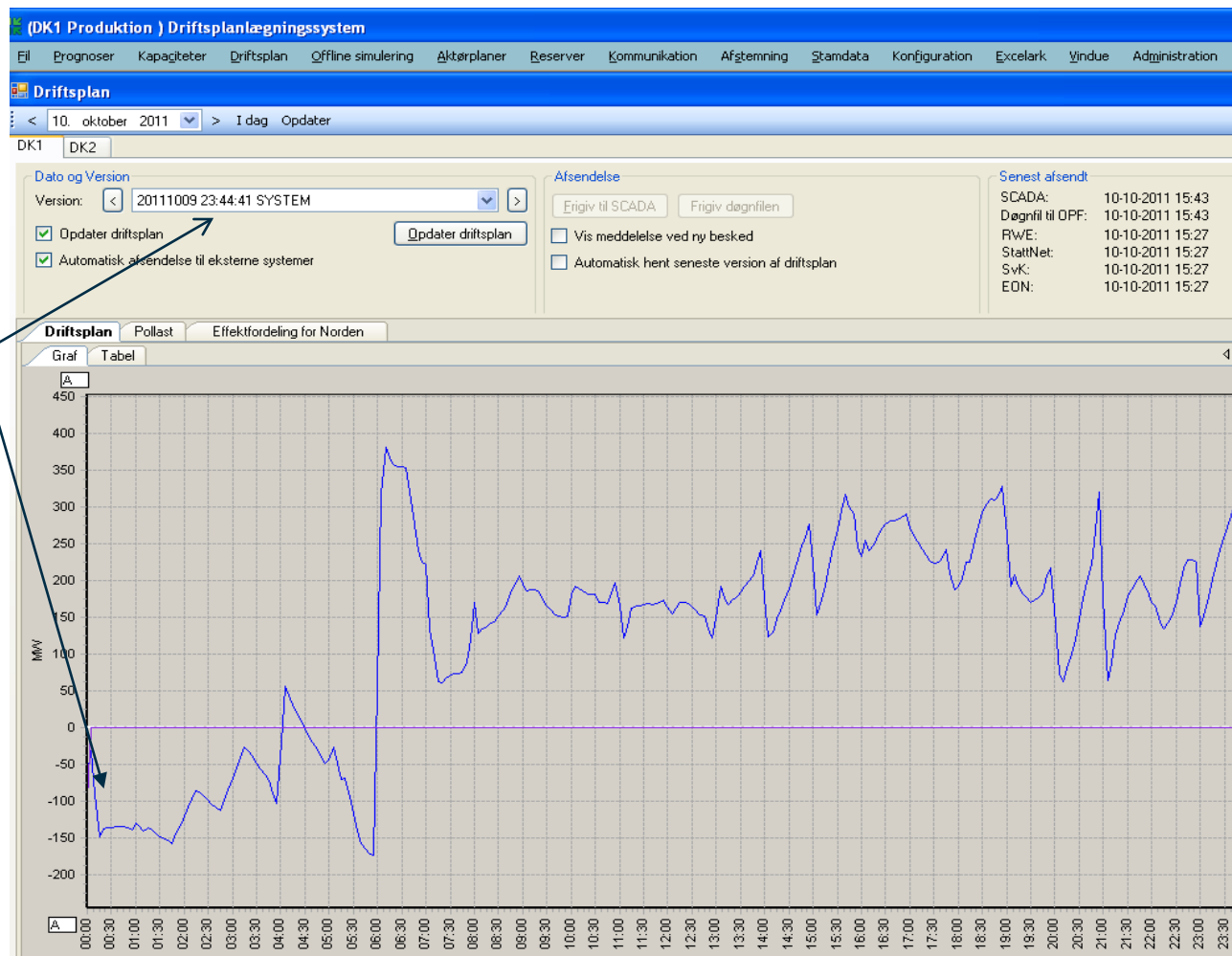
Demand, Wind Power and a part of CHP is based on predictions. The rest: CHP, Conventional power and exchange is scheduled by the market players. The schedules is updated if they deviates more than 10 MW. Schedules is encourage by a speciel power settlement.

The goal for balance is ~ 0



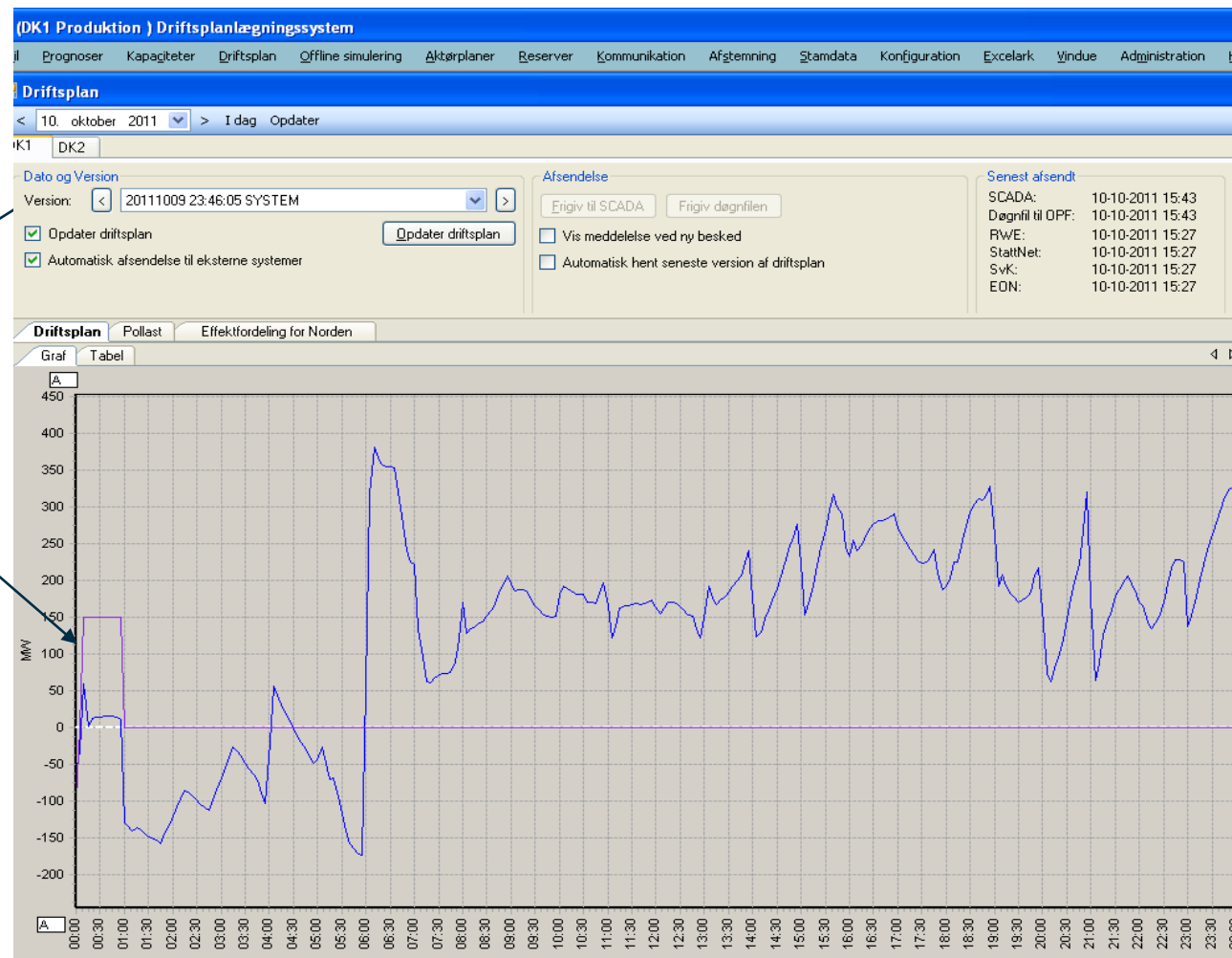
Utilization of forecasts

Here vi we discover an imbalance and decided to make a regulation

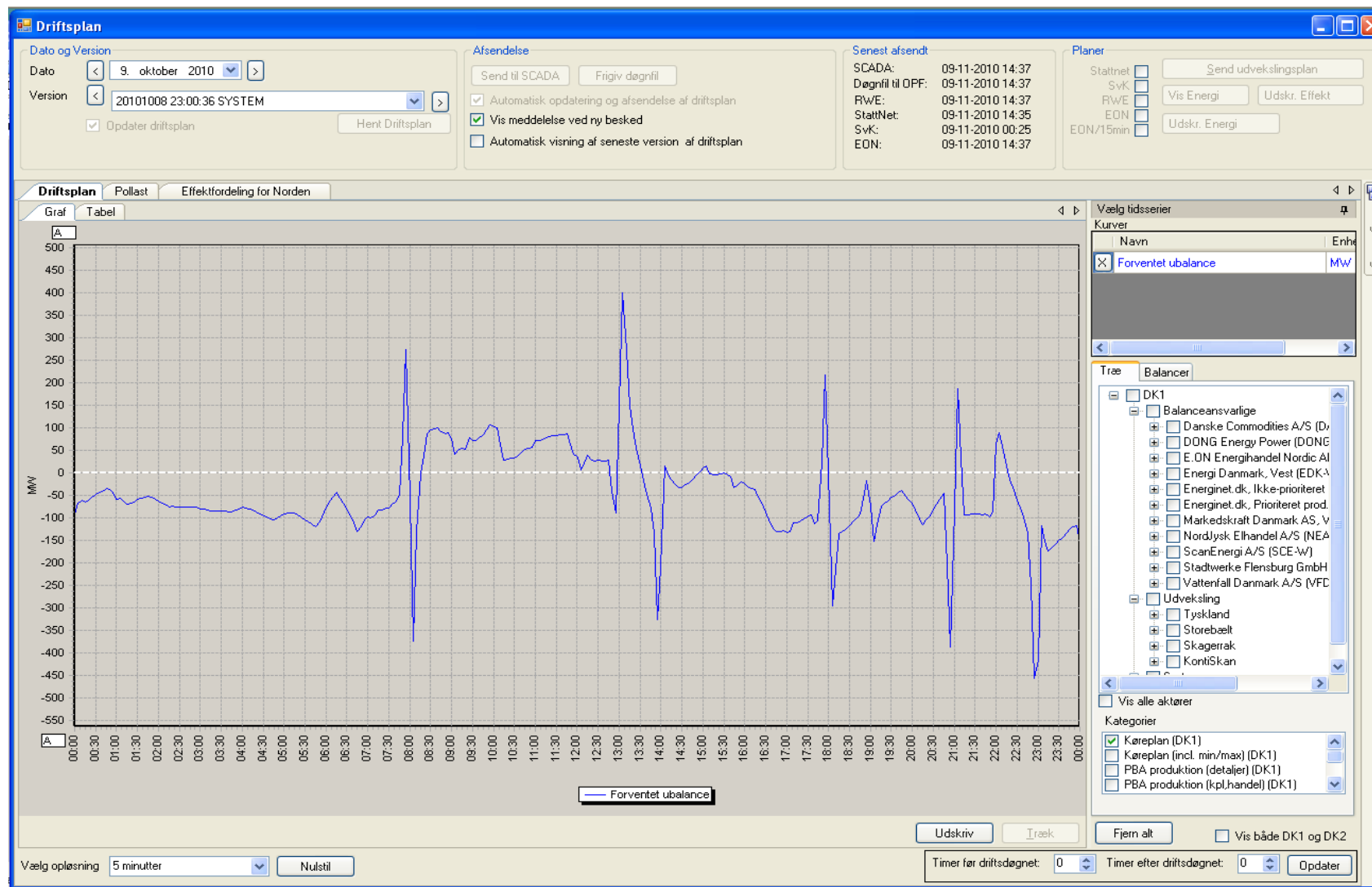


Usages of forecasts

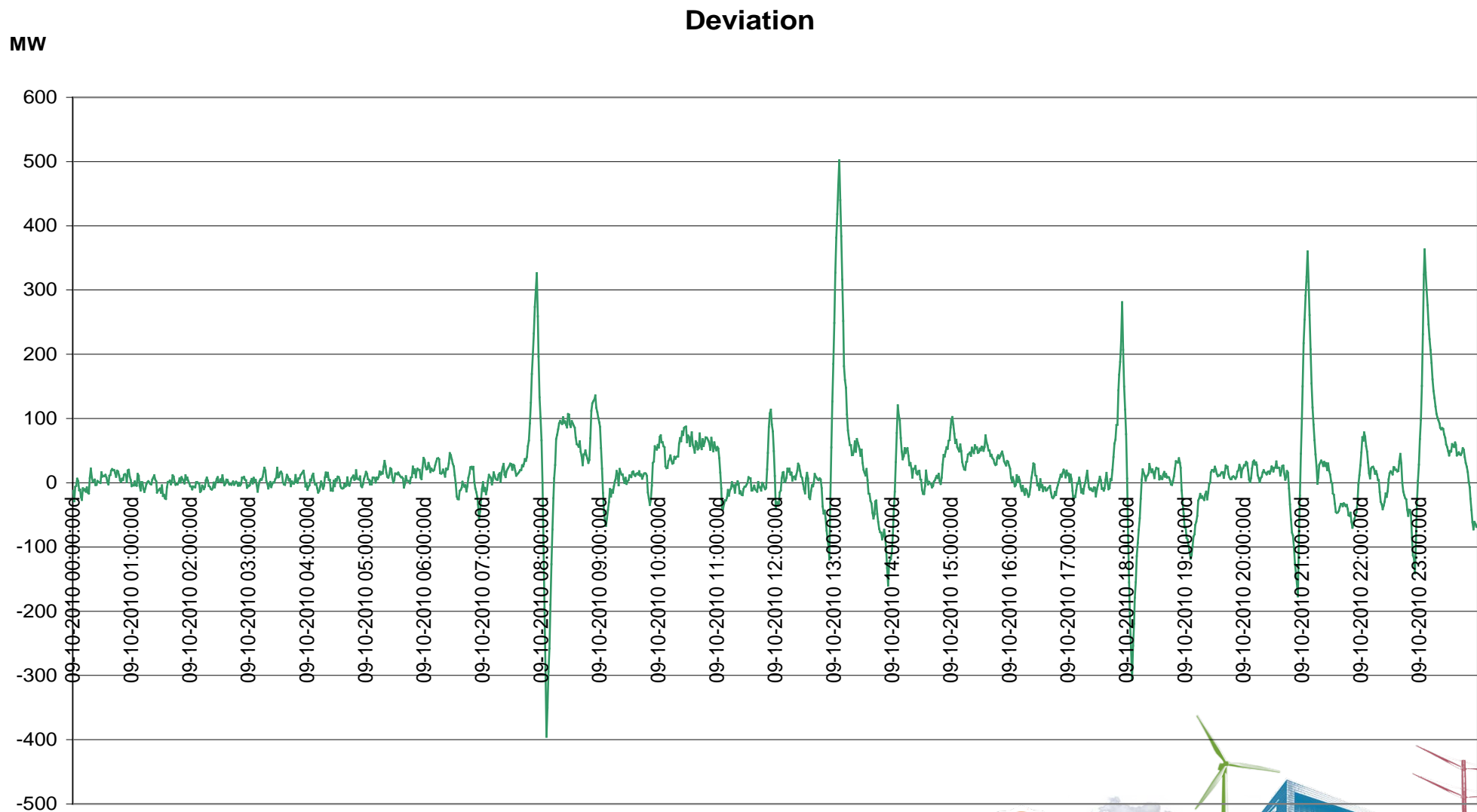
The order to make a regulation is send to the market participant whit the cheapest bid in the market and the imbalances is recalculated to be close to zero.



Predicted area deviation 9.10.2010



Online measured area deviation 9.10.2010



Future forecasting

- Wind power
 - More offshore => more volatility => forecast gets harder
 - Wind at regulating units => more need of information's



Future forecasting

- PV (16 MW => 45 MW in 2012)
 - New discipline in Denmark
 - Need of online measurements for revising forecasts
- Other forecasts (Demand, exchange on interconnectors eg)



Cooperation between TSO's

- On regional og Pan European level
- To utilize the grid better
 - Exchange of data
 - basic data like installed capacity, distribution of turbines
 - online measurements
 - Exchange of predictions
 - aggregated values
 - detailed information's
- To share reserves
- To exchange imbalances

