

Financing and developing energy projects in a free-market environment requires insight of the future wholesale energy prices. The wide variety of price-driving factors increases the difficulty in predicting the market state in the years to come.

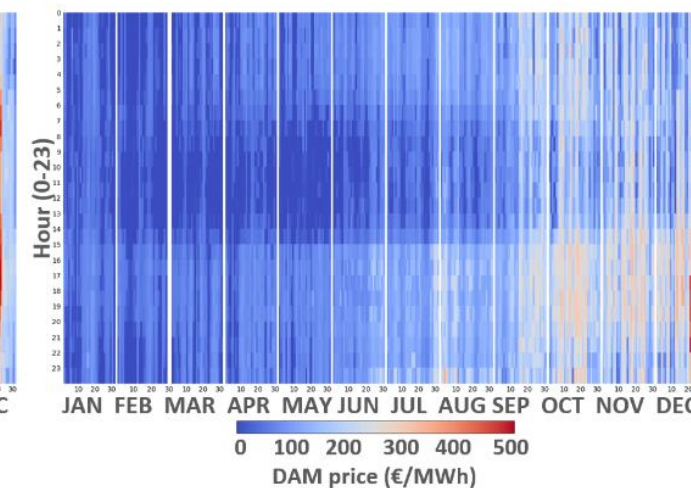
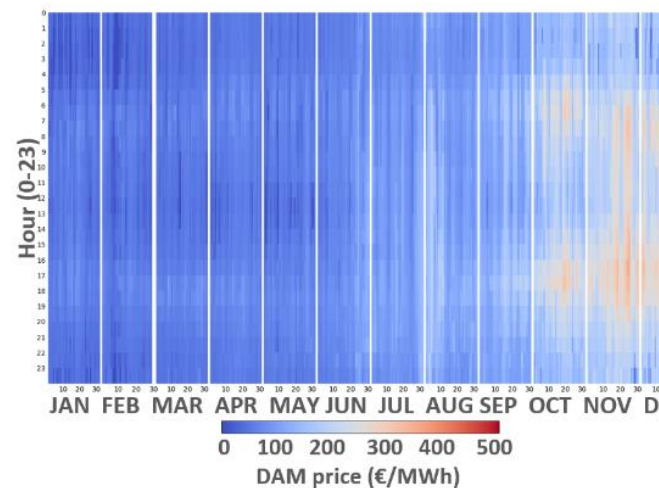
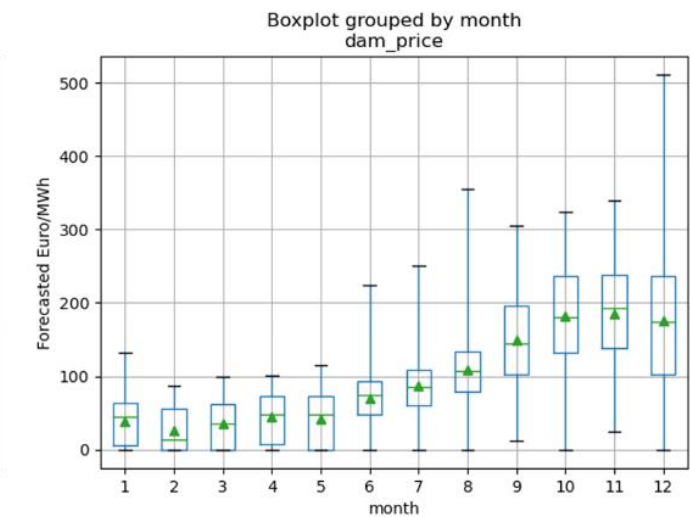
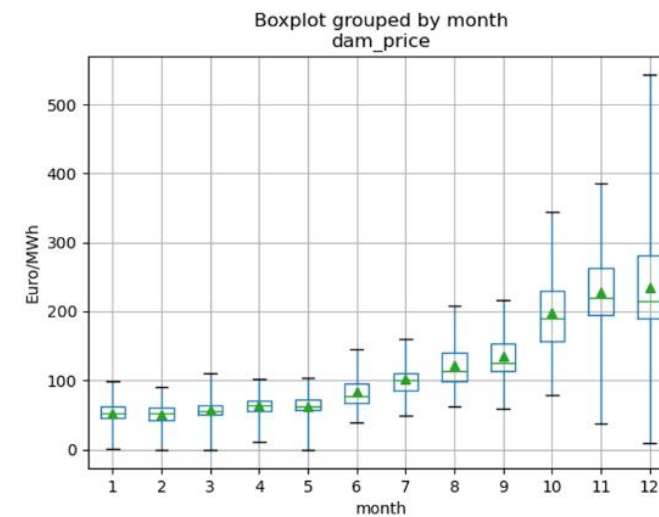
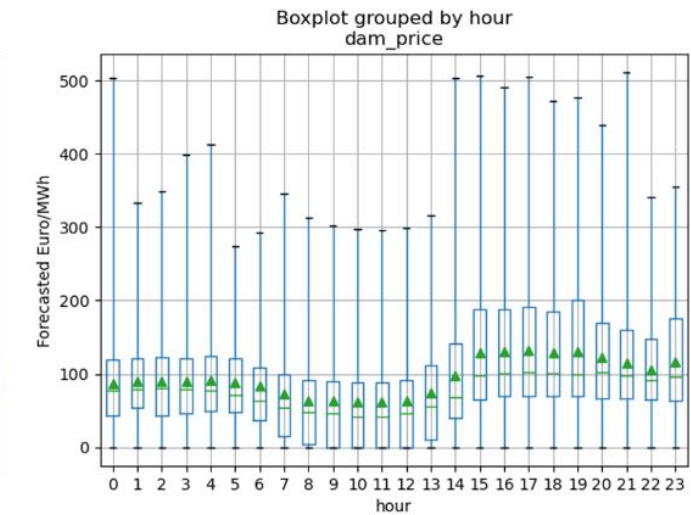
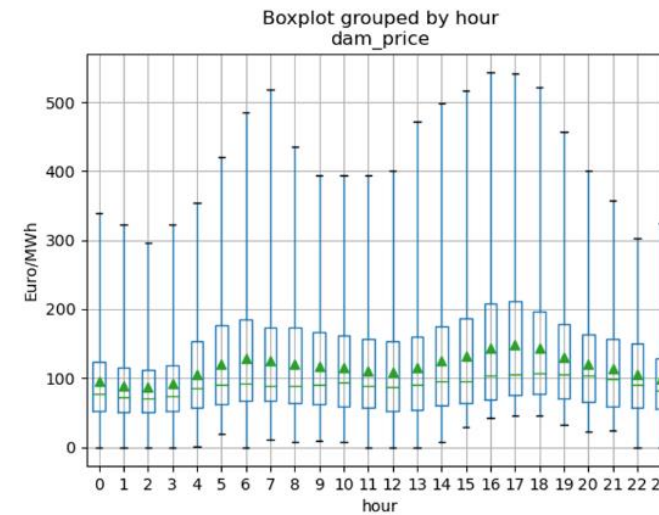
Day-ahead Market (DAM) and Balancing Market (BM) prices depend on:

- The participation of the different sources in the energy mix
- The Natural Gas price (NG will be the main fossil fuel at high volumes during energy transition)
- The CO₂ price
- The actual evolution of variable renewable energy system (VRES) capacity in time
- The evolution of Energy Storage Systems (ESS) and Demand-side Management (DSM) capacity in time
- The uncertainty of DA load and VRES production
- Other market factors

In this scope, **iWind** has developed a **tool for price forecasting** using Neural Networks (NN) algorithms. It uses historical values in the form of time-series and scenarios based on assumptions about the price-driving factors, to produce forecasted time-series for future DAM and BM prices.

The results of the forecasting model are not at the level of fidelity of modern electricity market models. Nevertheless, the present model can assess with satisfactory fidelity the trends in market prices when the parameters that shape them change. Moreover, the use of NN allows for a continuous retraining of the method in time and its adaptation to new market conditions.

The energy prices forecasting tool feeds the companion **Battery Energy Storage Systems Operation Optimization tool** - also developed by **iWind** - to estimate lifetime revenues for battery storage systems.



Day-ahead market prices grouped by hour (up), by month (mid) and annual heatmap (down). Real 2021 (left) and forecasted (right) DAM prices according to the Greek 2030 NECP scenario assuming 2021 gas prices.