

Power markets

Energy Cork

1st Nov 2018

Stan Linehan

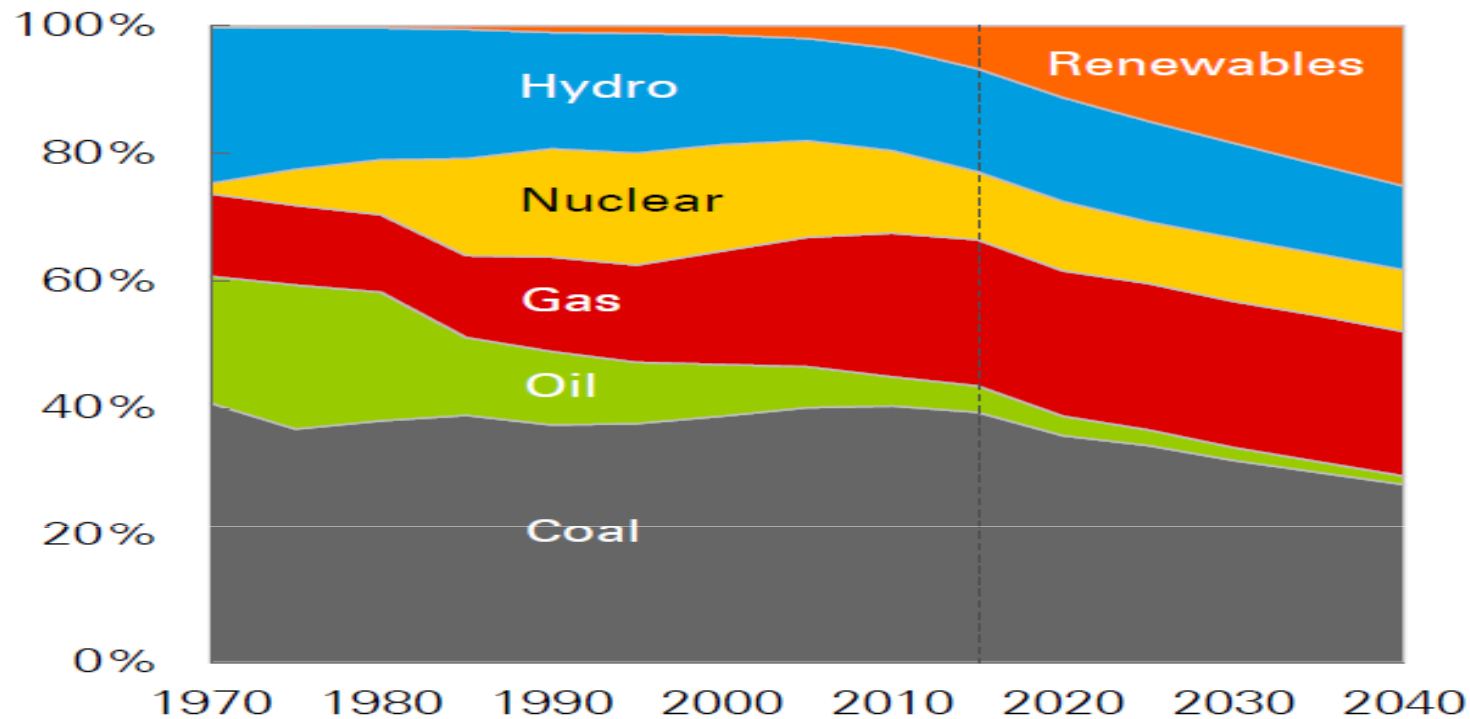


Topics

- Fuel mix locally and globally used in power generation.
- ISEM market.
 - Out-turn prices.
 - Risks to participants in new market.
- ISEM capacity market results.
- Future power generation developments.



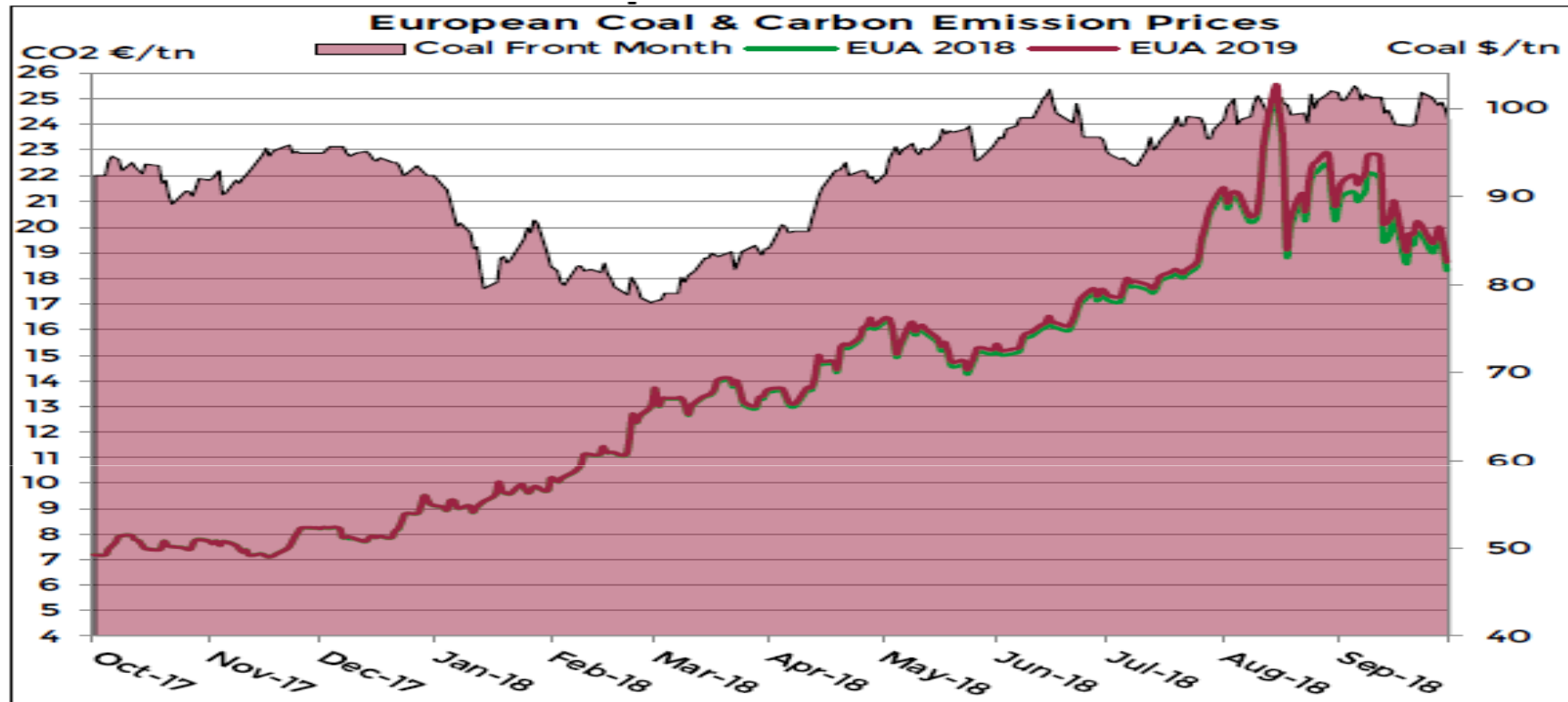
Fuel Mix Globally



- Oil ceases to be used for power generation in many countries.
- Renewable power generation to increase worldwide.
- Gas fired power stations are being built as a replacement for coal.
- Coal fired generation's share decreases from 40% currently to 30% share in 2030.



Coal & Carbon



- Price of over €30/tn required to trigger the full utilization of European Gas plants.
- 75MT of emission reductions should the carbon price exceed €30/tn.



Coal Plants until recently have been observing decreased running

UK runs without coal power for three days in a row

Demand lower following recent warm weather, making it easier for gas, renewables and nuclear to cover UK's needs



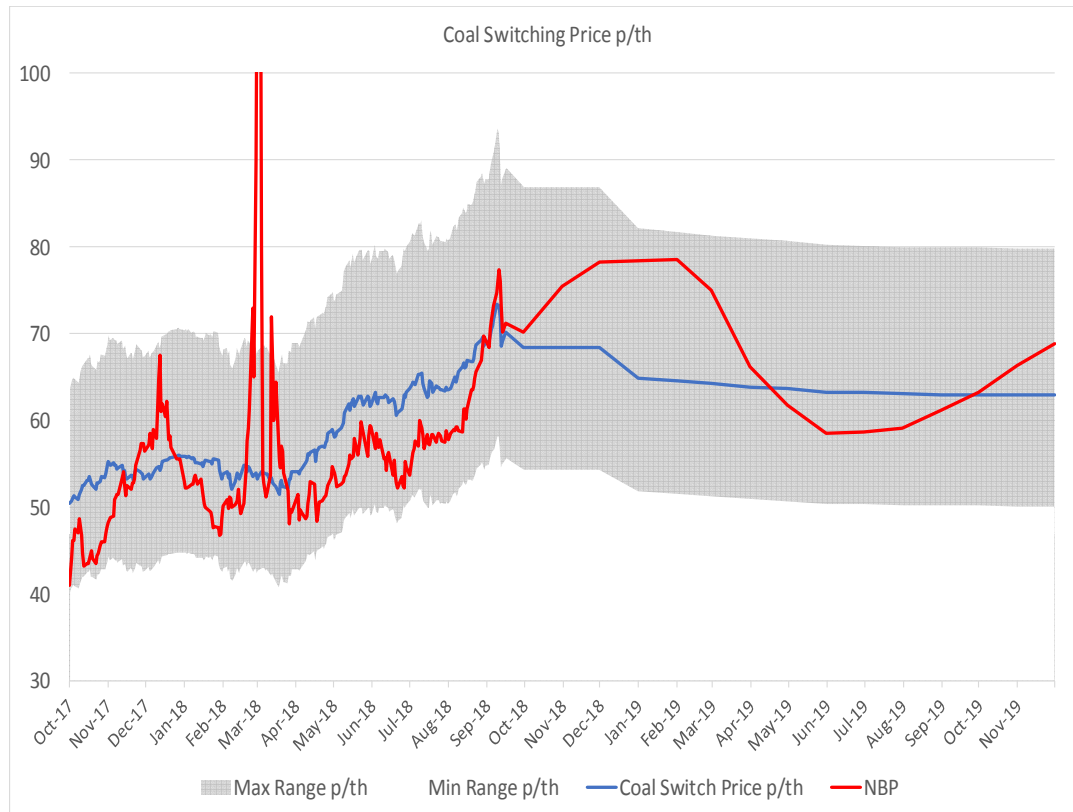
▲ Drax power station in North Yorkshire said it expected to go without coal on Tuesday. Photograph: Nick Moore/Alamy



“Runs completely on electricity – generated by a tiny coal-burning power plant.”



Coal switching in the GB power market



- GB power market has to pay a carbon tax of £18/tonne in addition to the ETS price.
- Last 3 months have seen coal plants become more competitive despite rises in carbon.

Coal comeback could drive up UK energy emissions - report

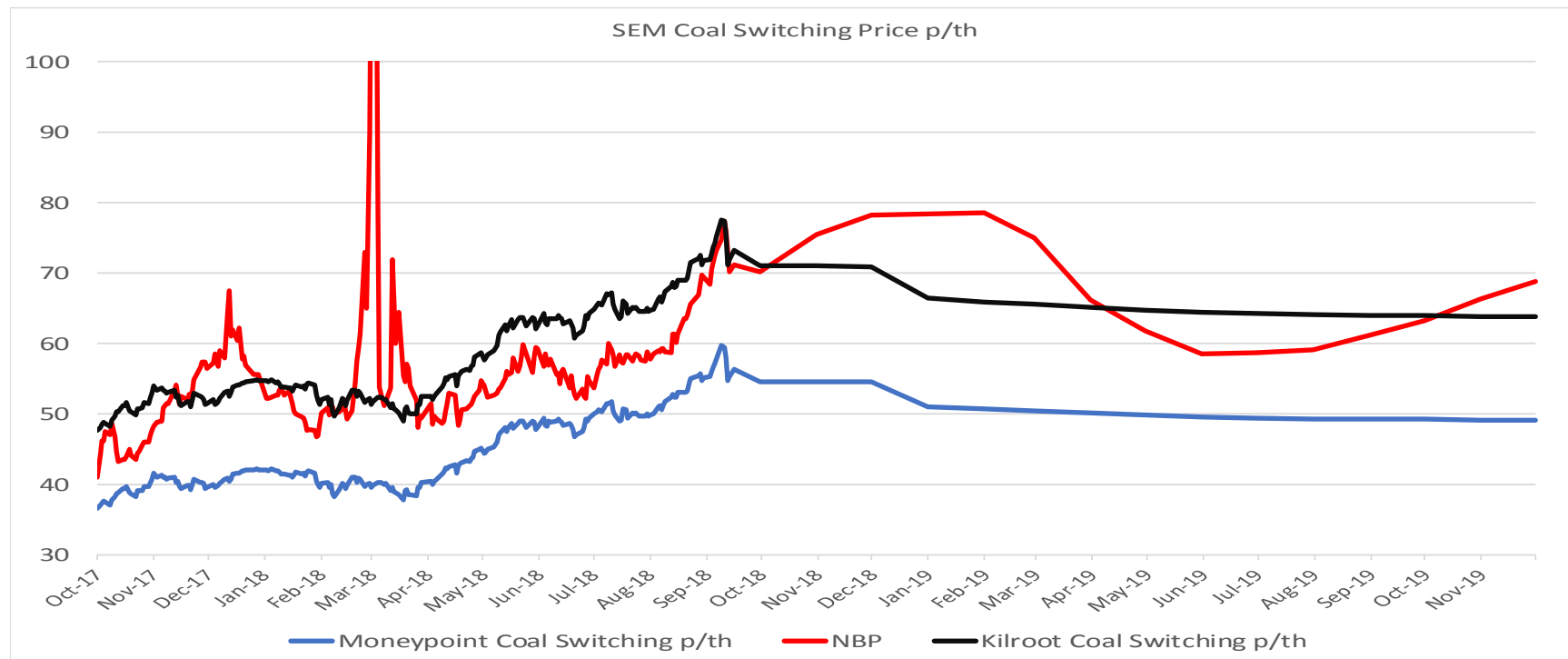
Extra coal-burning may lead to problems meeting binding carbon targets



▲ The resurgence of coal is good news for Germany's Uniper, which operates the Ratcliffe-on-Soar plant in Nottinghamshire. Photograph: eye35.pix/Alamy

Coal plants have become more economic to run than their gas counterparts in the past month because wholesale gas prices have hit 10-year highs. A report by Imperial College London said the extra coal burning had increased emissions by 15% in September, equivalent to an extra 1,000 tonnes of

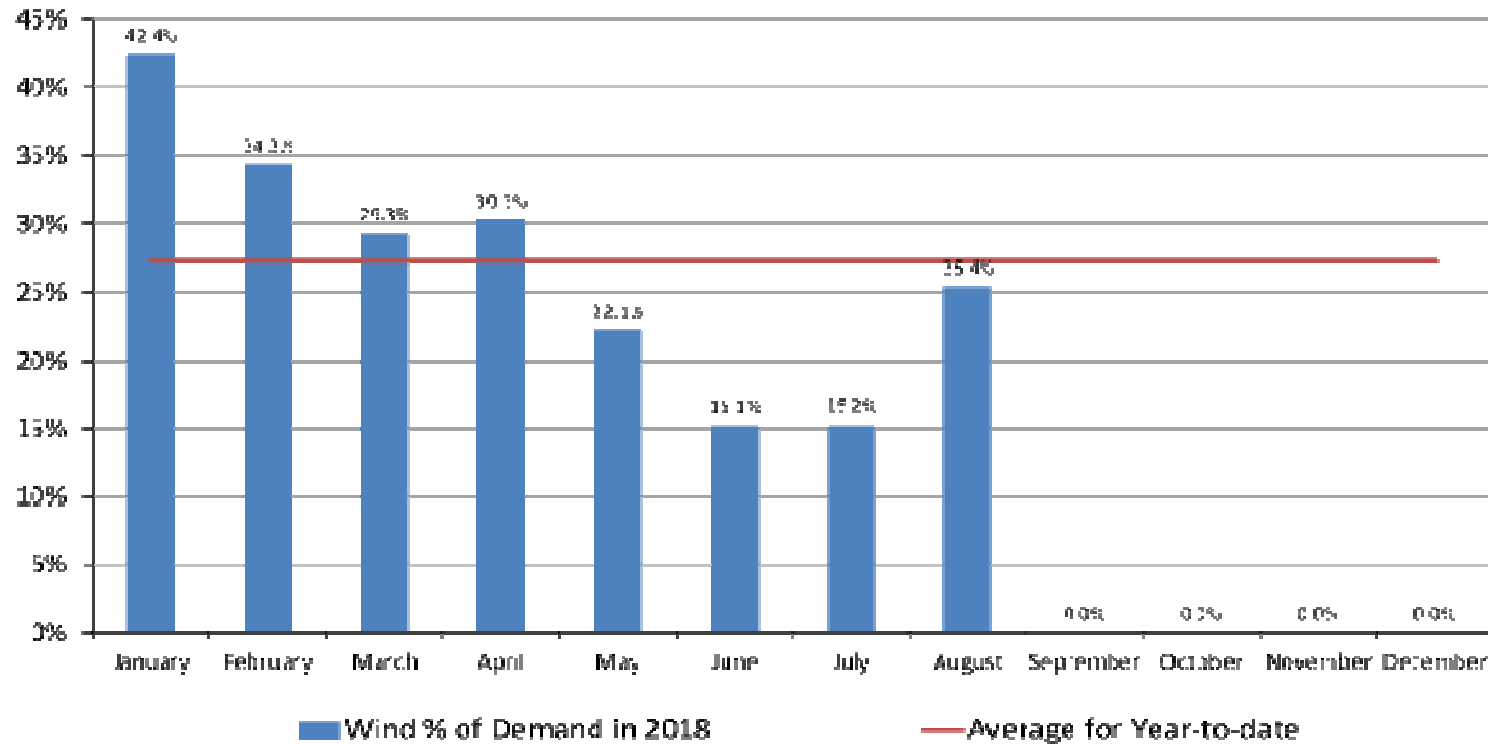
Coal switching in the Irish power market



- Two Coal Units in Ireland.
 - Moneypoint (Co Clare).
 - Kilroot (Co Antrim).
- In Irish power market coal units are more competitive than in GB due to the absence of a carbon floor tax.
- Moneypoint is in merit.
- Kilroot plant should see some running over the winter period.



% of Demand met by wind

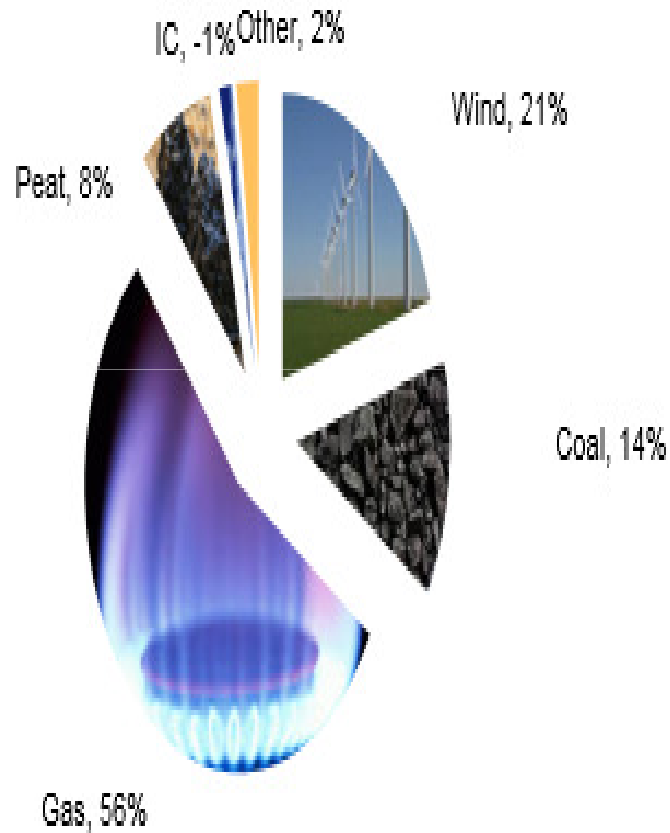


- Wind has supplied 27% of demand year to date compared to 25% for same period last year.
- 426MWs of new wind generation installed across Ireland last year.
- 3.3 GWs of wind currently installed.
- 700 MWs of new wind capacity planned in the next year.

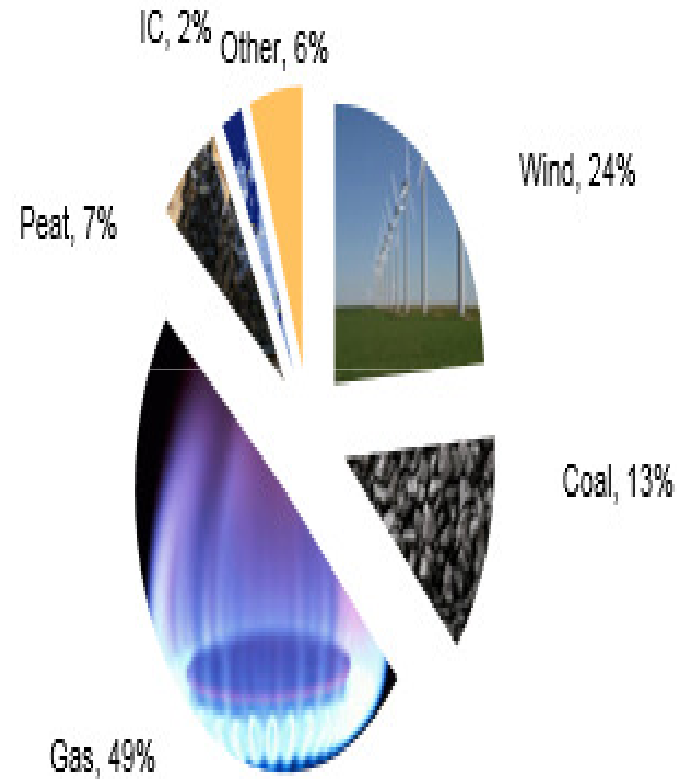


Fuel Mix Changes past 12 months

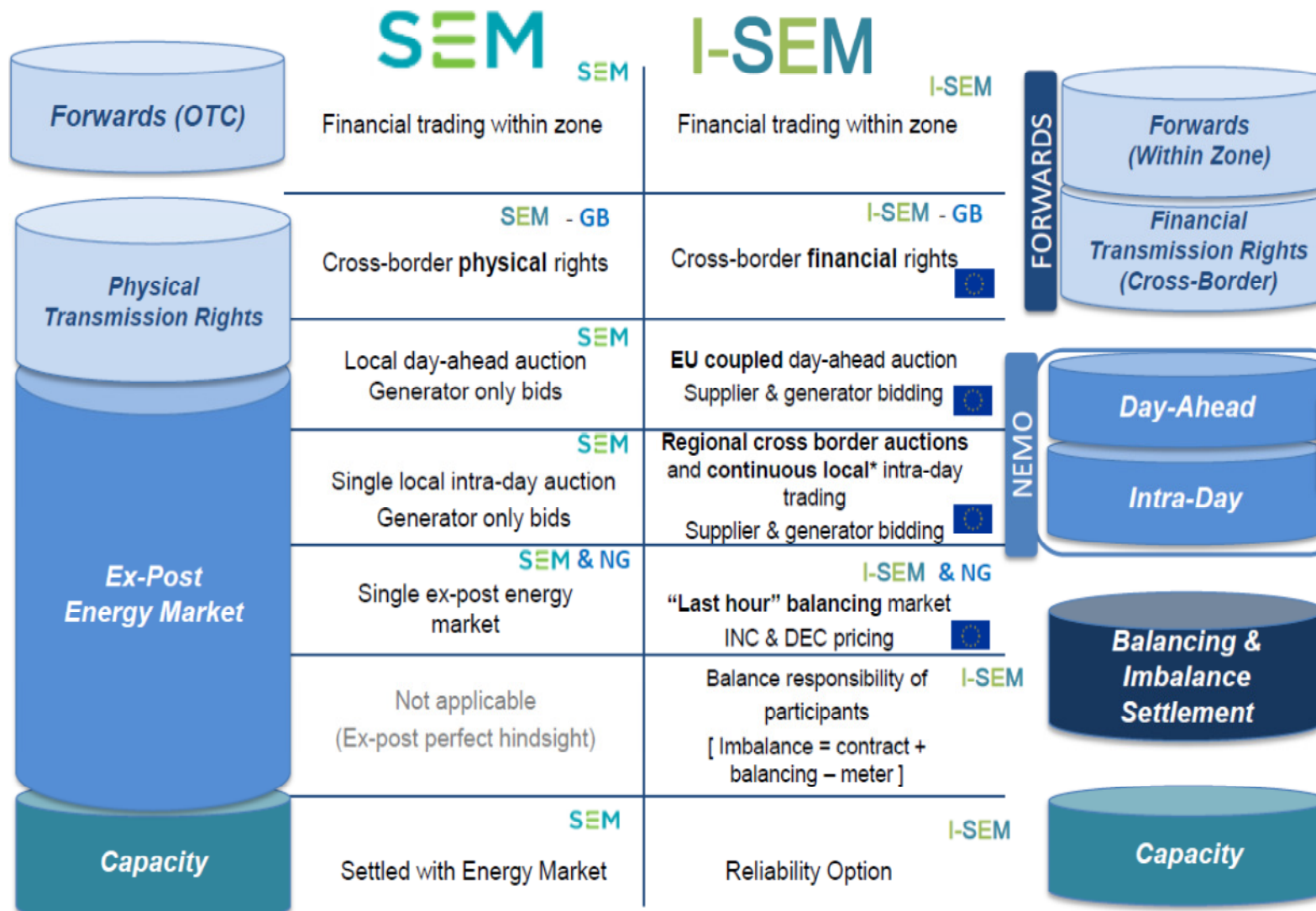
Generation by Source Sep 16-Sep 17



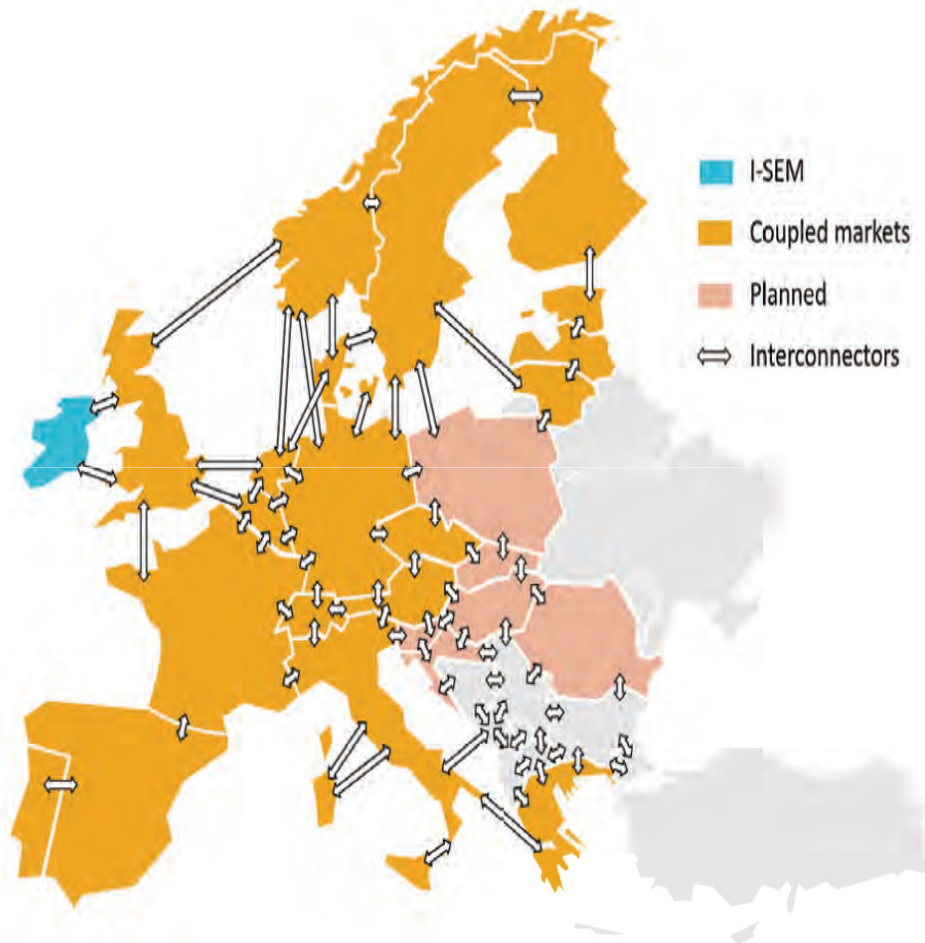
Generation by Source Sep 17-Sep 18



ISEM Market



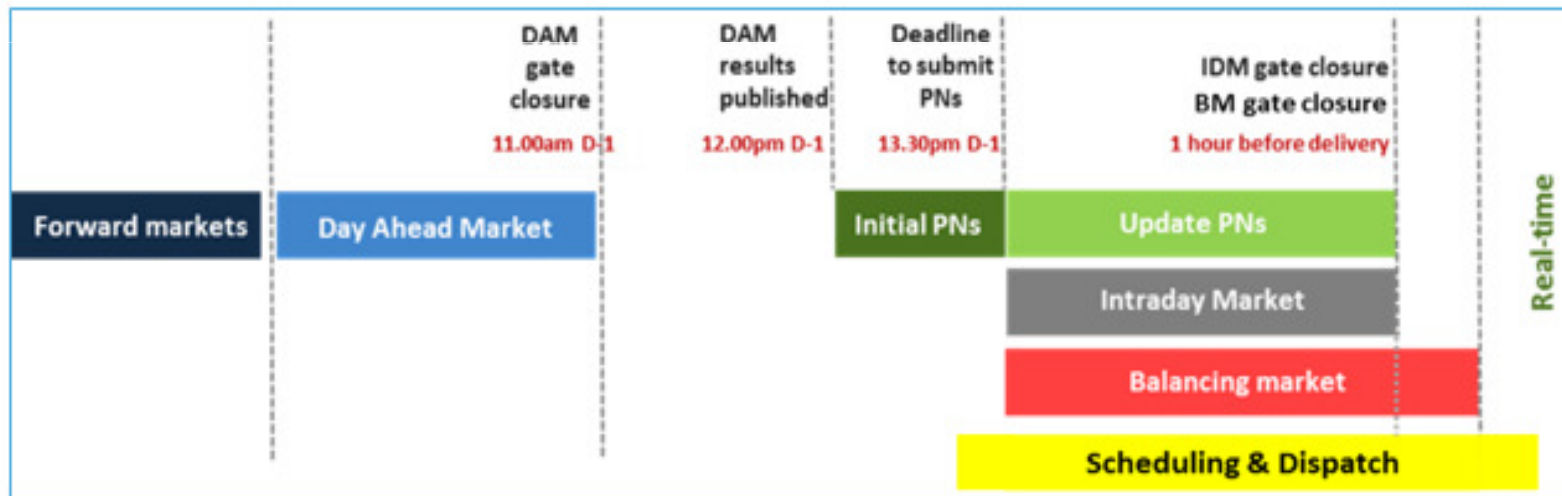
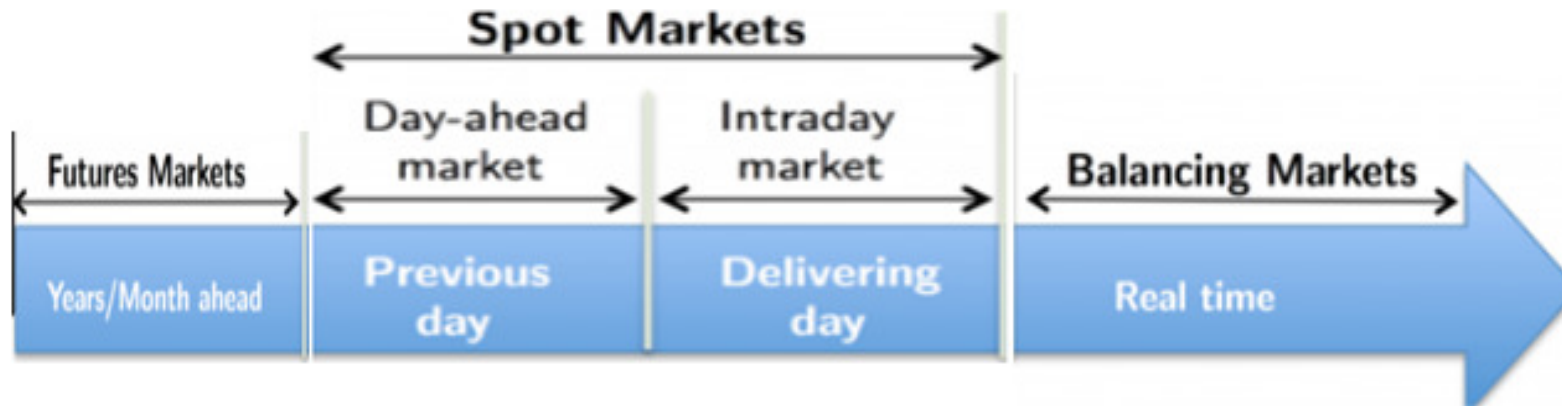
Market coupling (Day ahead , Intra-Day)



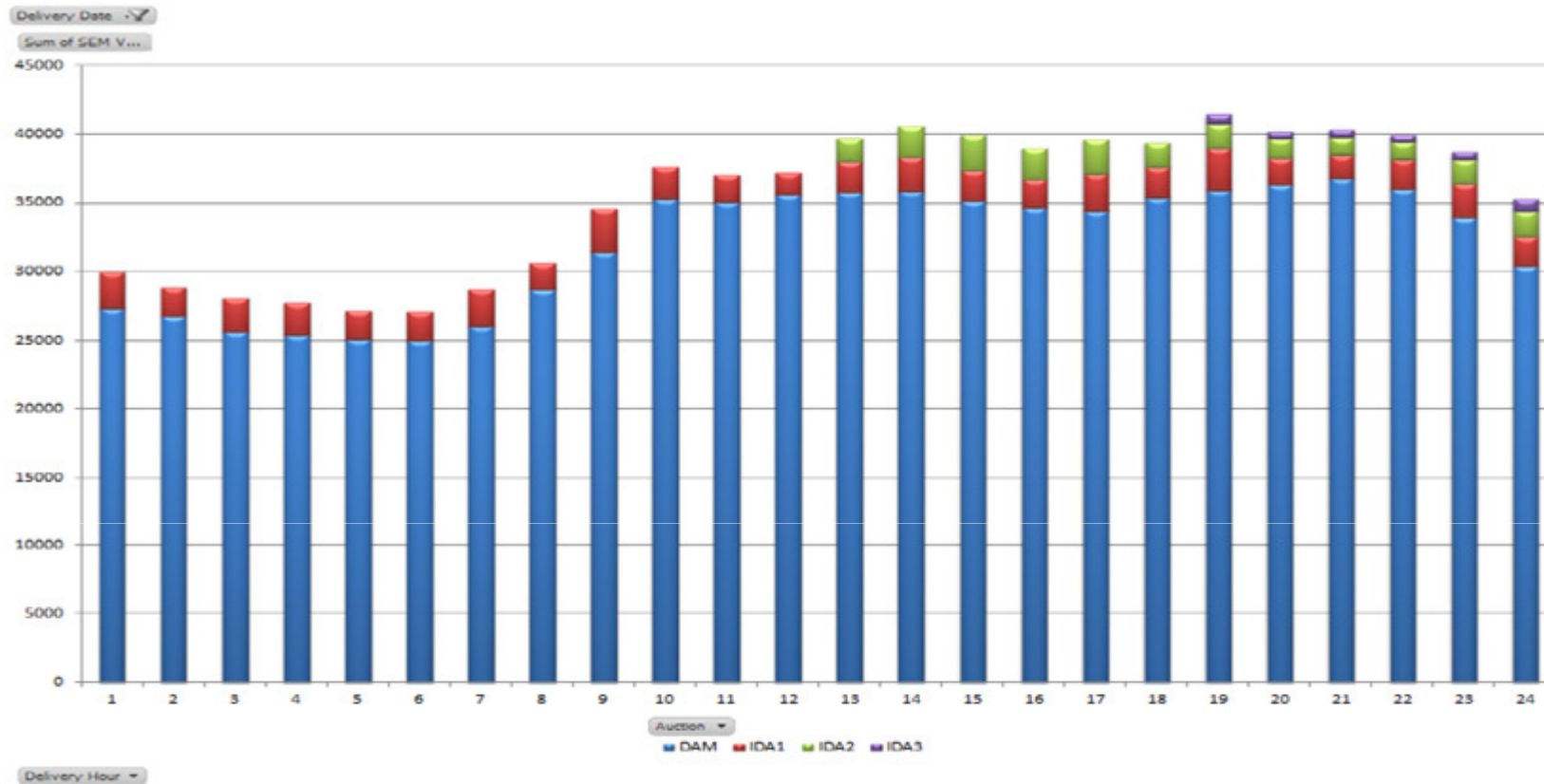
- Common price coupling algorithm
 - Schedules day ahead markets
 - Determines flows between different markets.
- Prices converge if I/C is not congested, diverge if I/C is congested.
- Financial Transmission Rights for hedging price differences between regions.



ISEM Market Timeline



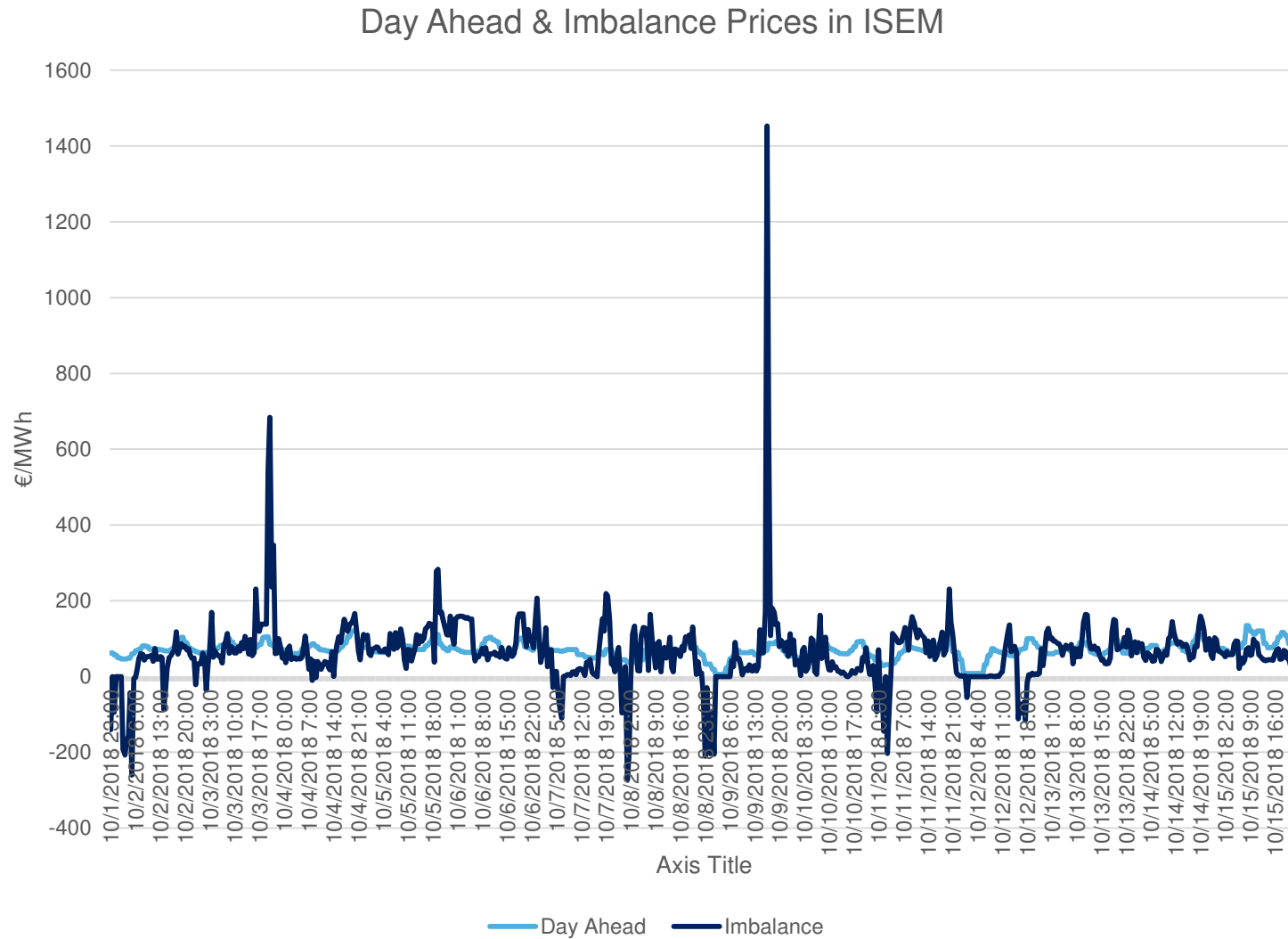
Volumes in different markets



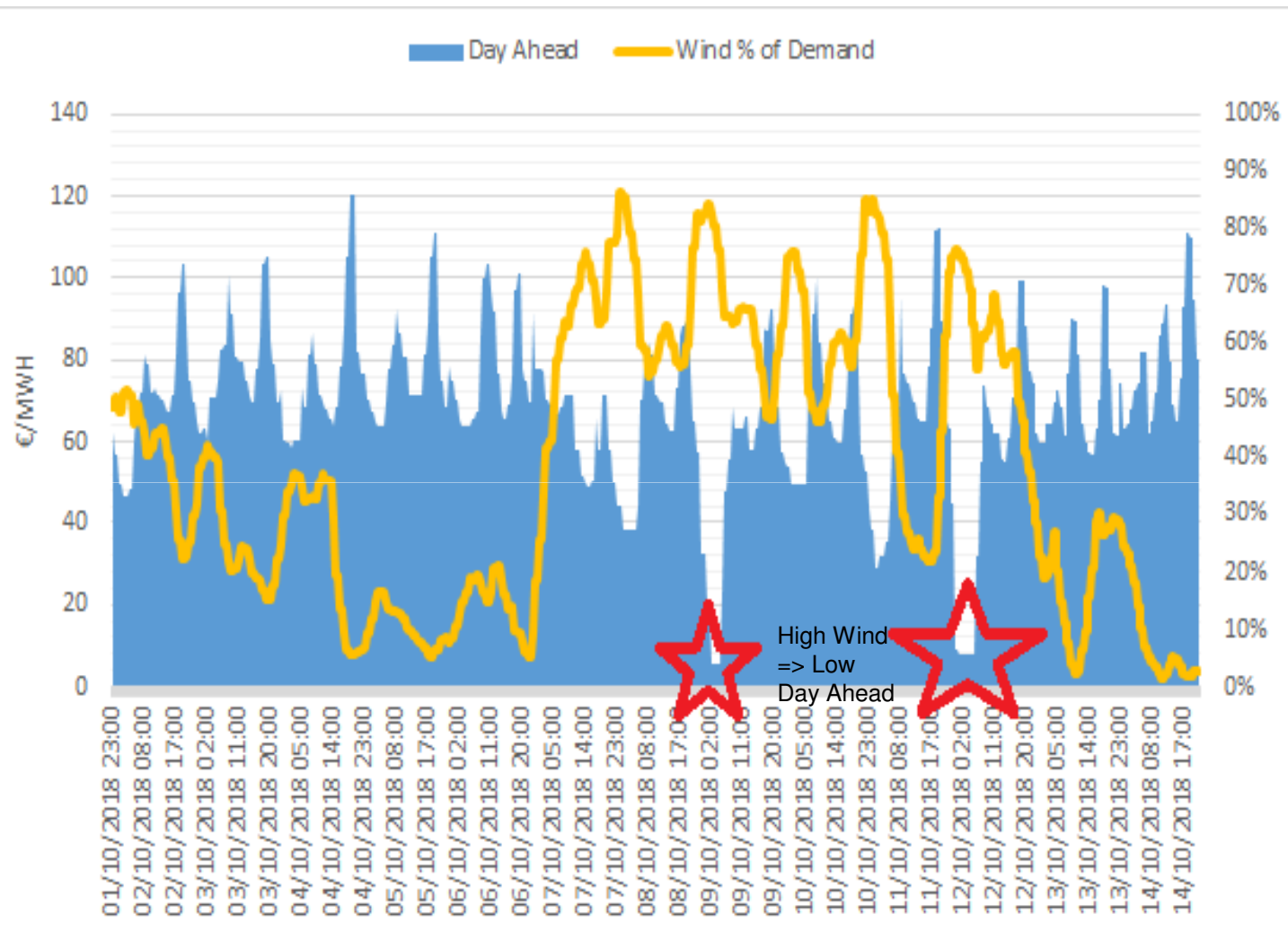
- % DAM (Day Ahead Market) volumes 1st week.
 - IDA1 6.74%
 - IDA2 2.69%
 - IDA3 0.48%
 - IDC 3.42%
- Suppliers cleared 98% of their volume in DAM.



Day Ahead & Imbalance Prices ISEM

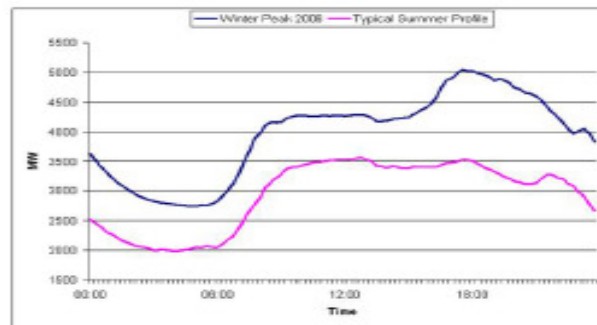


Day ahead vs Wind volumes

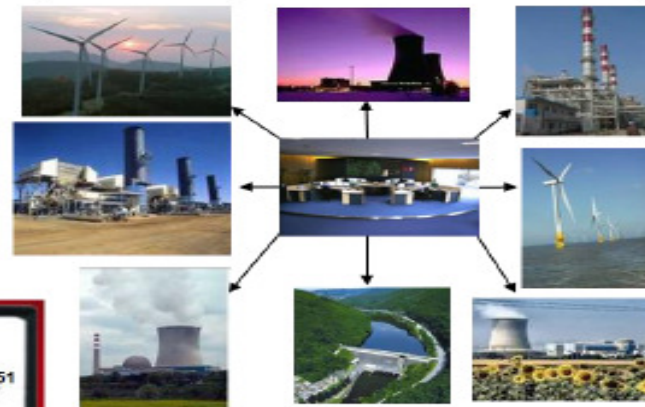


ISEM Balancing Market

Load changes through the day ...



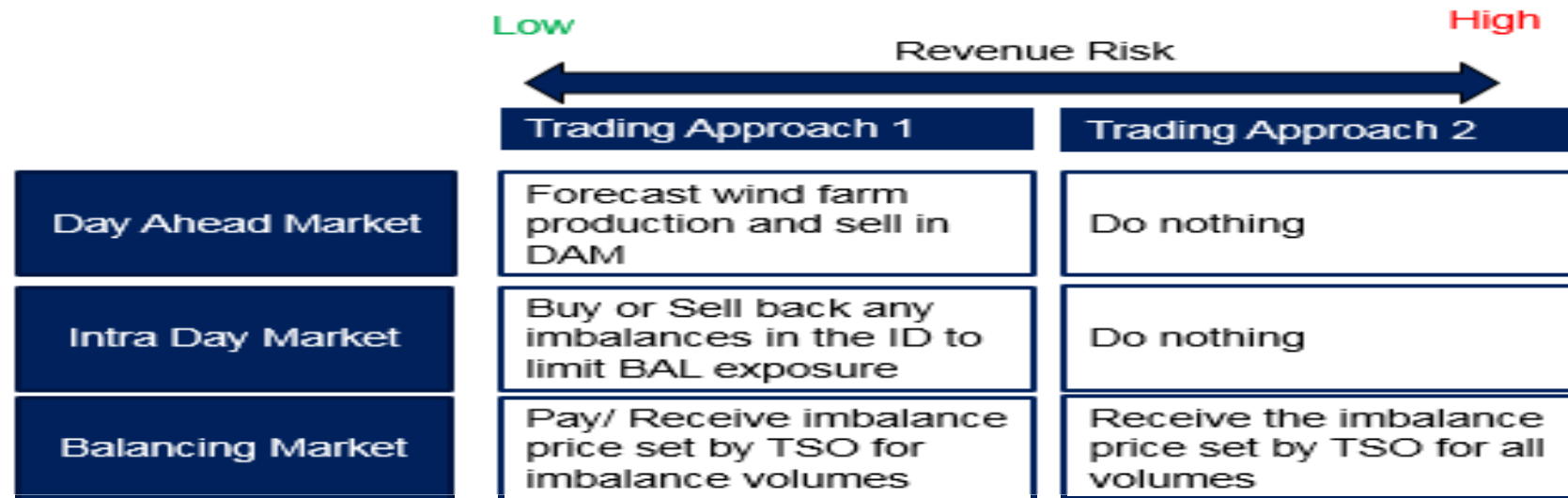
...Generation output must match this



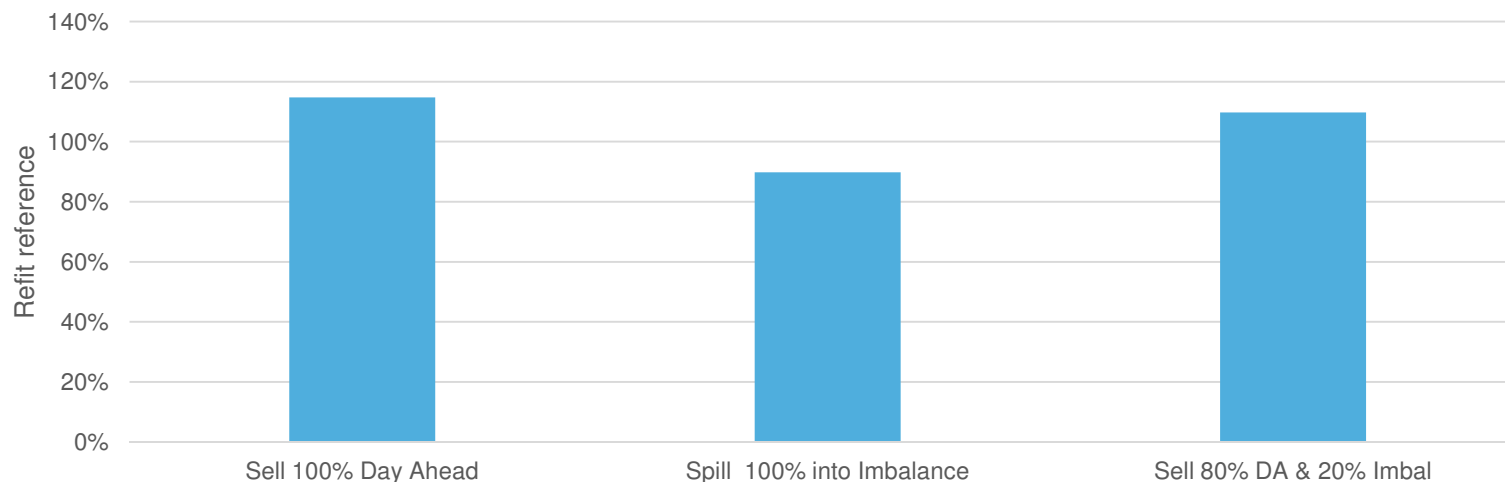
- Balancing market outcomes driven by,
 - Day Ahead, Intraday , continuous market.
 - High Wind, lower system margins.
 - Physical nominations and offers/bids of generators

- Outcomes broadly reflective of fundamentals,
 - Long => low/negative prices.
 - short => higher prices.

Wind Generators have new risk



Which market do you sell wind into ?



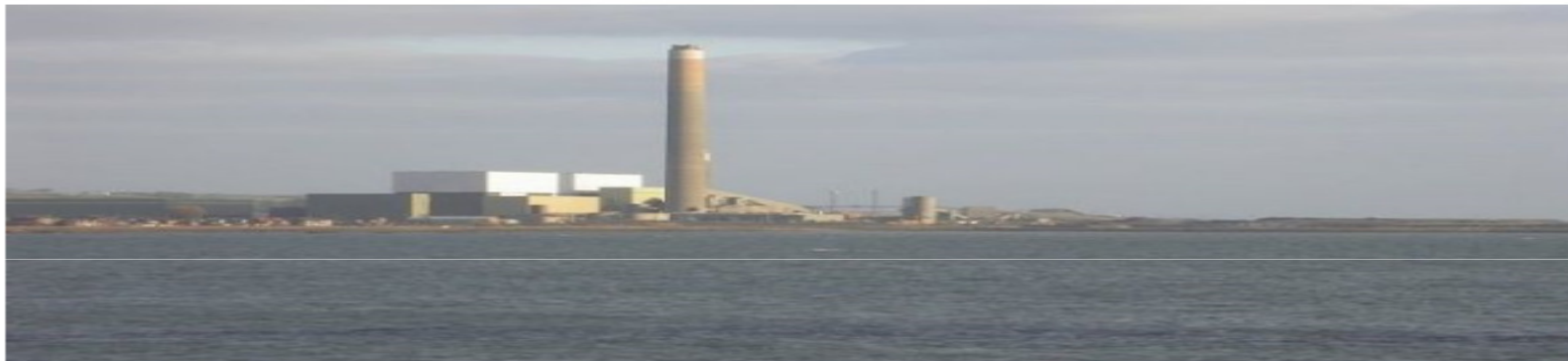
Capacity Market ISEM

Power plants face closure as energy market is reorganised

Electricity grid operators on both sides of Border cutting 'capacity payments' by 30%

© Fri, Jan 26, 2018, 18:04

Barry O'Halloran, Francesc McDonnell



Kilroot power station: Its owner, AES Corporation, said the station could close by May. Photograph: Robin Some

- Intended to cover annual fixed costs.
- ISEM Capacity contracts out-turned @ €41.8K/MW/Year.
- Kilroot coal units announced closures as a result of being unsuccessful in securing a contract.
- Huntstown and Ballylumford units announced closures.
- Capacity market is reducing by €180 million a year.

Successful Units in ISEM capacity auction

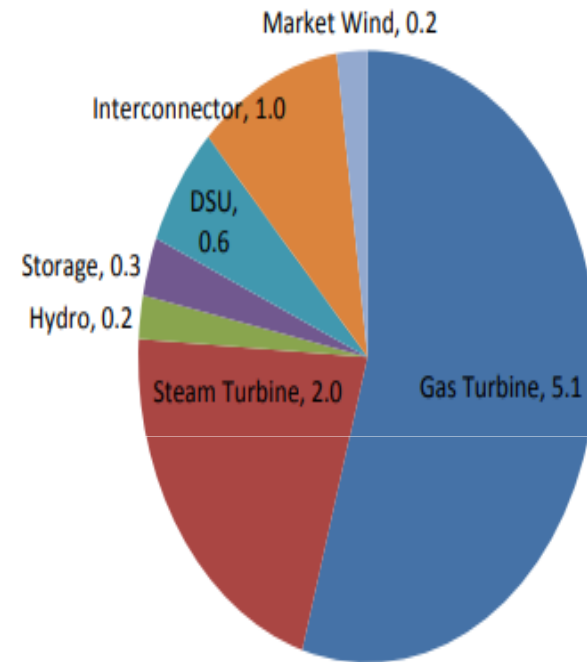
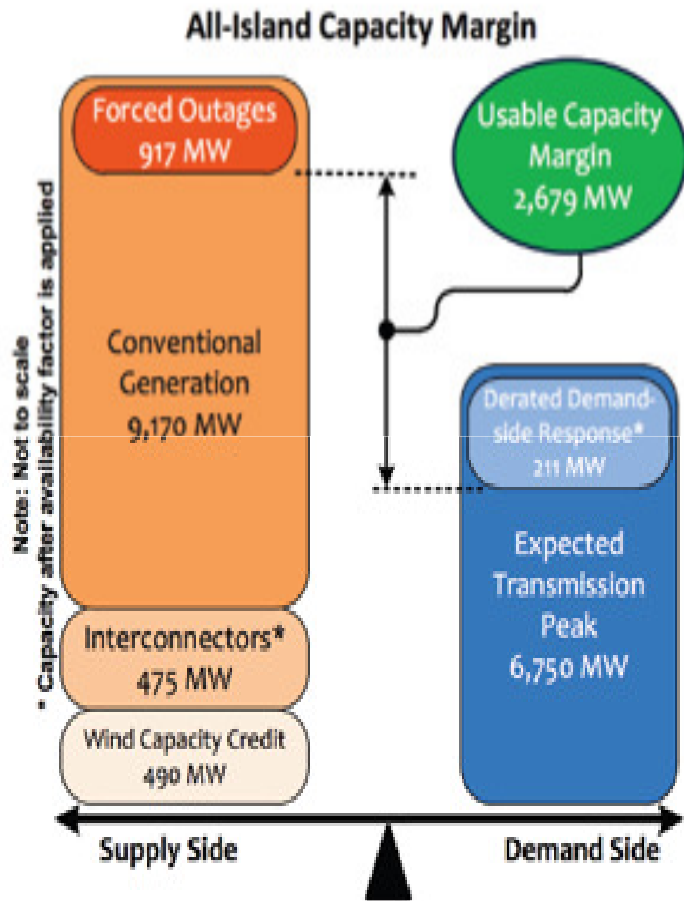
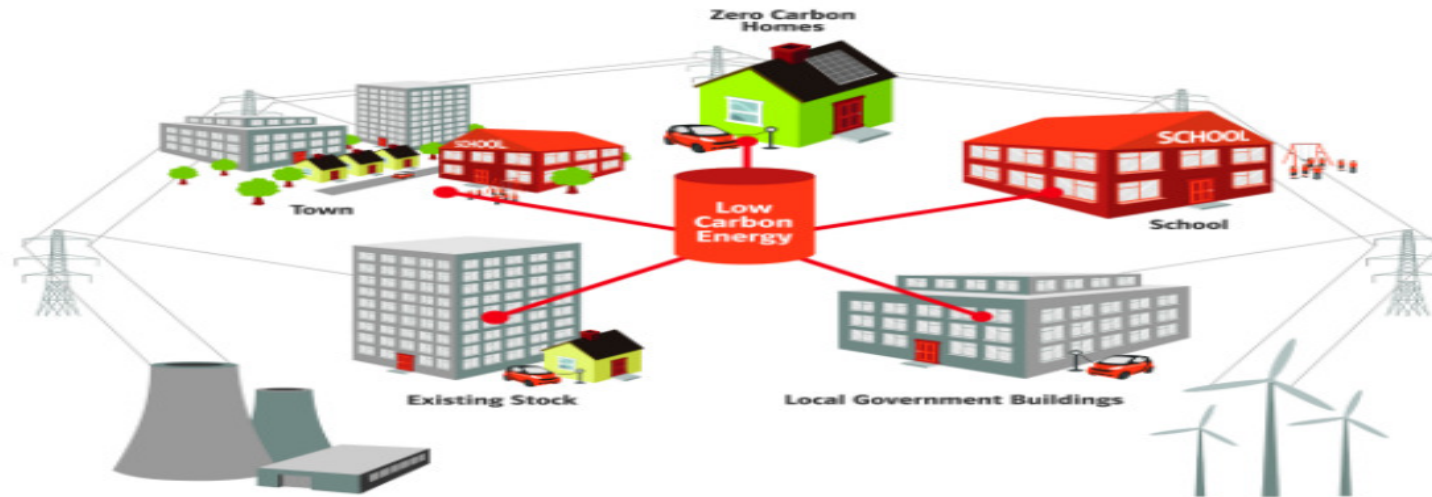


Figure 3-1 The total amount of capacity (GW) that cleared the first T-1 All-Island Capacity Market auction in December 2017 was 9.4 GW. Here it is divided into the technology categories used in the Capacity Market.

Summary of Future Developments



- Decentralised smaller generators.
 - Energy is produced close to where it consumed rather than a large plant and sent through the grid.
 - Consumers producing own electricity , consuming it and storing it with batteries.
 - Increasing demand side management.
- Generators to earn an increasing portion of their revenue providing services that help the system operator .



Summary

- Forward power curve derived from forward gas curve.
- ISEM market commenced Oct 1st.
 - Relatively stable Day Ahead Prices.
 - Volatile imbalance prices.
 - Accurate forecasts of generation & demand critical.
- Capacity market .
 - New DSU units achieved contract.
 - Older units (Ballylumford & Marina & Huntstown unit) unsuccessful.
- Traditional conventional generators will earn more of their revenue outside of the wholesale market.
- Power customers to become “prosumers” in the future.
- Coal fired power generation on a downward trajectory in Europe.

