AN INDUSTRY PERSPECTIVE ON CHALLENGES IN MODELLING POWER MARKETS BEYOND CURRENT POLICIES
An industry perspective on challenges in modelling power markets beyond current policies

- What models do we use?
- What time horizons do we look at?
- What are long term prognoses used for?
- Dispatch focused models versus energy focused models
- Key factors considered in capacity changes
- Many challenges remain…
What models do we use?

- **Nordics and Baltics**
  - Hydropower dispatch focus
  - Detailed modelling with *EMPS* developed by SINTEF
  - New capacity added through in-house models

- **Continental Europe, Great Britain and Turkey**
  - Thermal dispatch focus
  - Detailed modelling with *ProSym* now part of ABB
  - New capacity added through in-house models
What time horizons do we look at?

**Short Term**
- Power system largely known and static composition
- Main uncertainties: fuel prices, demand and weather

**Medium Term**
- Power system dynamic yet defined by current policy
- Main uncertainties: power system development, fuel prices and climate

**Long Term**
- Power system dynamic and policy largely unknown
- Main uncertainties: energy policy, technology development
What are long term prognoses used for?

- **Strategy**
  - Which markets are most attractive, which are a dead end?
  - Examples: Enter the energy services market in X. Exit gas fired generation in Norway.

- **Investment and divestment decisions**
  - Will a power plant earn more than it costs to build?
  - Examples: Merchant plants and plants under the UK’s CFD

- **Long term contracts**
  - What should be the price for contracts with longer horizon than the market?
  - Examples: 10-20yr Power Purchase Agreements, industrial supply contracts

- **Valuation of the company**
  - Setting a value of future income helps define how much can be borrowed and invested
# Dispatch focused models versus energy focused models

<table>
<thead>
<tr>
<th><strong>Market Simulation</strong></th>
<th><strong>System Optimization</strong></th>
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<tbody>
<tr>
<td>Focus on dispatch of power plants and price profiles</td>
<td>Focus on energy System cost optimization based on technological and environmental constraints</td>
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<tr>
<td>Requires: External calculation of energy system development or iterative process</td>
<td>Requires: Assumptions on technology cost, policy etc.</td>
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<td>Best for: “Precise” running patterns of plants and prices</td>
<td>Best for: “Optimal” energy system configurations</td>
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Key factors considered in capacity changes

- National and EU policy
- Emissions targets
- Security of supply
- Plant age
- National energy mix
- Relative competitiveness in that year
- Assessment of NPV
Many challenges remain...

**Policy:**
Which low emissions techs will be favoured?

**Technology:**
What will be available in 10yrs time?

**Water:**
How will climate change affect hydropower?

**Transport:**
How fast will uptake of electric cars happen?

**Heating:**
What will replace gas in the heating sector?
THANK YOU

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- Trading activities

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- Berry Burn Wind Farm
- Baillie Wind Farm
- Dogger Bank (Forewind Ltd)
- Dudgeon Offshore wind project
- Sheringham Shoal Offshore Wind Farm
- Alltwalis Wind Farm
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