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Keeping the lights on

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LCP in the energy market
Electricity market reform
**Background**

*Electricity market reform*

- GB power market is about to undergo fundamental reform:
  - **Contracts for Difference – to reduce emissions**
    - Changing the way low carbon generation is incentivised
  - **Capacity mechanism – to keep the lights on**
    - Change in the way power plants earn income
    - Auction run to procure new power plants or keep existing ones online
    - Government determine the level of capacity require
    - How much capacity do we need?

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**Energy security**

- Historically security measured by a “Derated Capacity margin”
- Not easily adapted to allow for generators with correlated output eg. wind. This requires a probabilistic approach.
- Three main sources of uncertainty
  - Demand variation
  - Power plant outages
  - Intermittent generation
Understanding wind uncertainty

- Challenges of wind modelling output:
  - Changing wind fleet
  - Geographical correlation
  - Varies with turbine height

- Solution: NASA MERRA data

Model outputs

*Distribution of demand and generation*

- Generation
- Availability
- Demand

Unserved energy risk

GW
Distribution of unserved energy

Conclusions of the modelling

Are the lights going to go out?

How secure should we be?

Scope

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