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Imbalance costs and risks

An update

CLIENT: DECC
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Reputation built on Results

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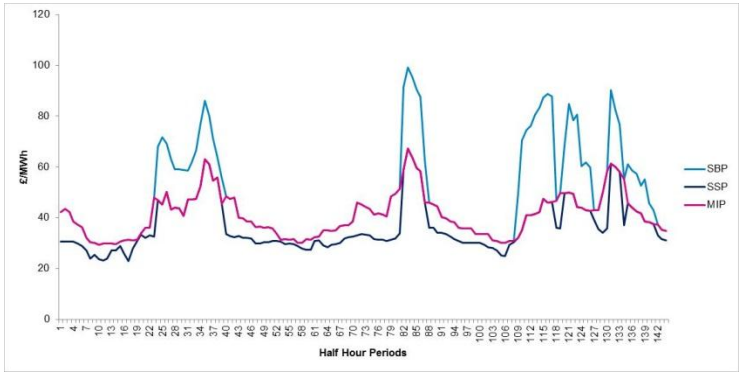
Objectives

- Provide a quantification of the current and possible future risk associated with imbalance costs
- Deploy a simple, transparent approach consistent with understanding the materiality of the risk for project economics
- Assess the potential impact of changes to balancing arrangements and market fundamentals through sensitivities
- Understand the potential benefit of improved forecasting

Balancing arrangements recap

- Market participants buying and selling physical power are responsible for their own balancing on a half-hourly basis.
- To the extent that a participant's net position, including contracts, is not zero, this is treated as an imbalance and settled against 'cash-out' prices.
- The cash-out price that is applied depends on the direction of the imbalance relative to the overall system
  - Opposite direction: a market-related price is applied
  - Same direction: a price is applied reflecting the System Operator cost of balancing ("System Buy Price" or "System Sell Price").
- SBP/SSPs can be at a significant and volatile premium/discount to the underlying wholesale price.

	System long	System short
Participant long	SSP	MIP
Participant short	MIP	SBP



Use of historic data

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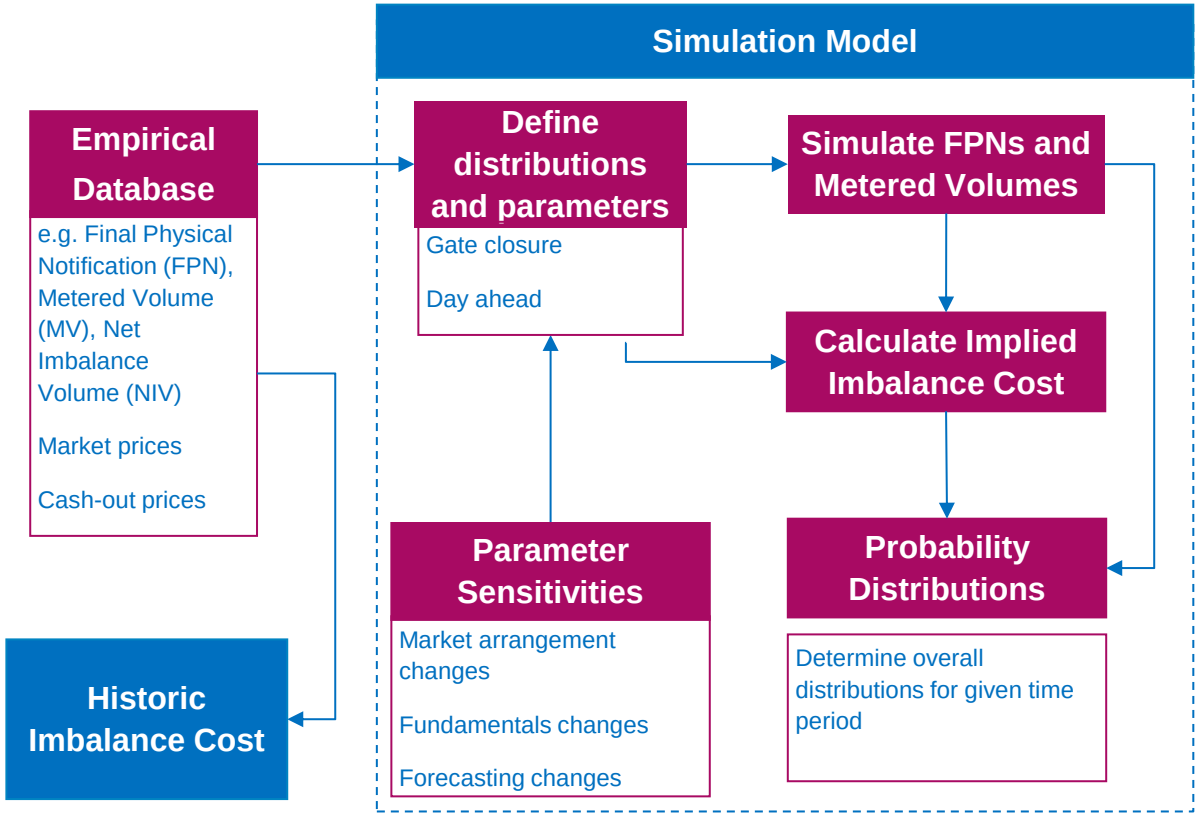
- The actual imbalance faced by participants will be a function of their portfolio and trading strategy.
- We are aiming to isolate the element of imbalance that can be attributed to uncertainty in relation to the level of outturn generation from an asset.
- We have used public domain data for transmission-connected assets (BM Units).
- Final Physical Notifications (FPNs) represent the information on expected output provided by generators to the System Operator at gate closure, 1 hour ahead of delivery – we use these as our proxy for the forecast information.
- We compare this to Metered Output, and treat the difference as a ‘forecast imbalance’.
- We then calculate a forecast imbalance cost by applying the appropriate cash-out price for that half-hour (depending on the relative direction of the forecast imbalance).

Risk assessment through simulation



Definitions

Forecast Imbalance Cost

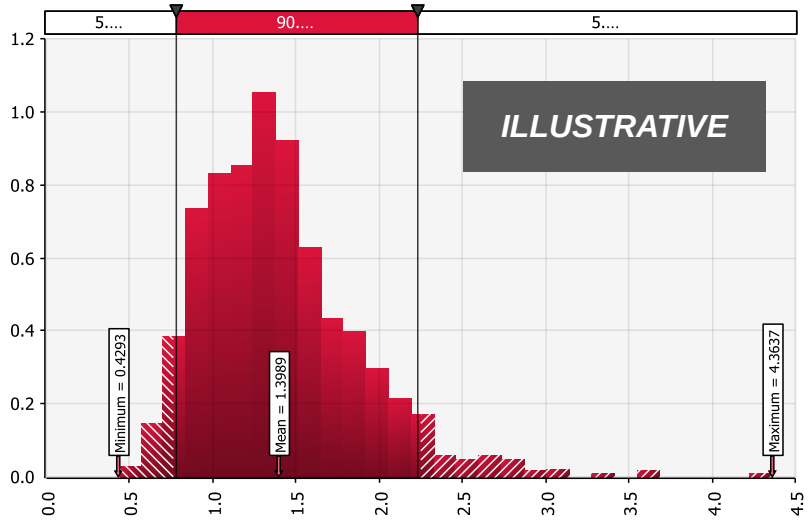
$$\frac{\sum(MV - FPN).(Cash\ Out\ Price\ - MIP)}{\sum MV}$$

MV = Metered Volume (MWh)
FPN = Final Physical Notification (MWh)
MIP = Market Index Price (£/MWh)

(Note that this is not actual imbalance – but a hypothetical imbalance if contracting matched FPNs at gate closure)

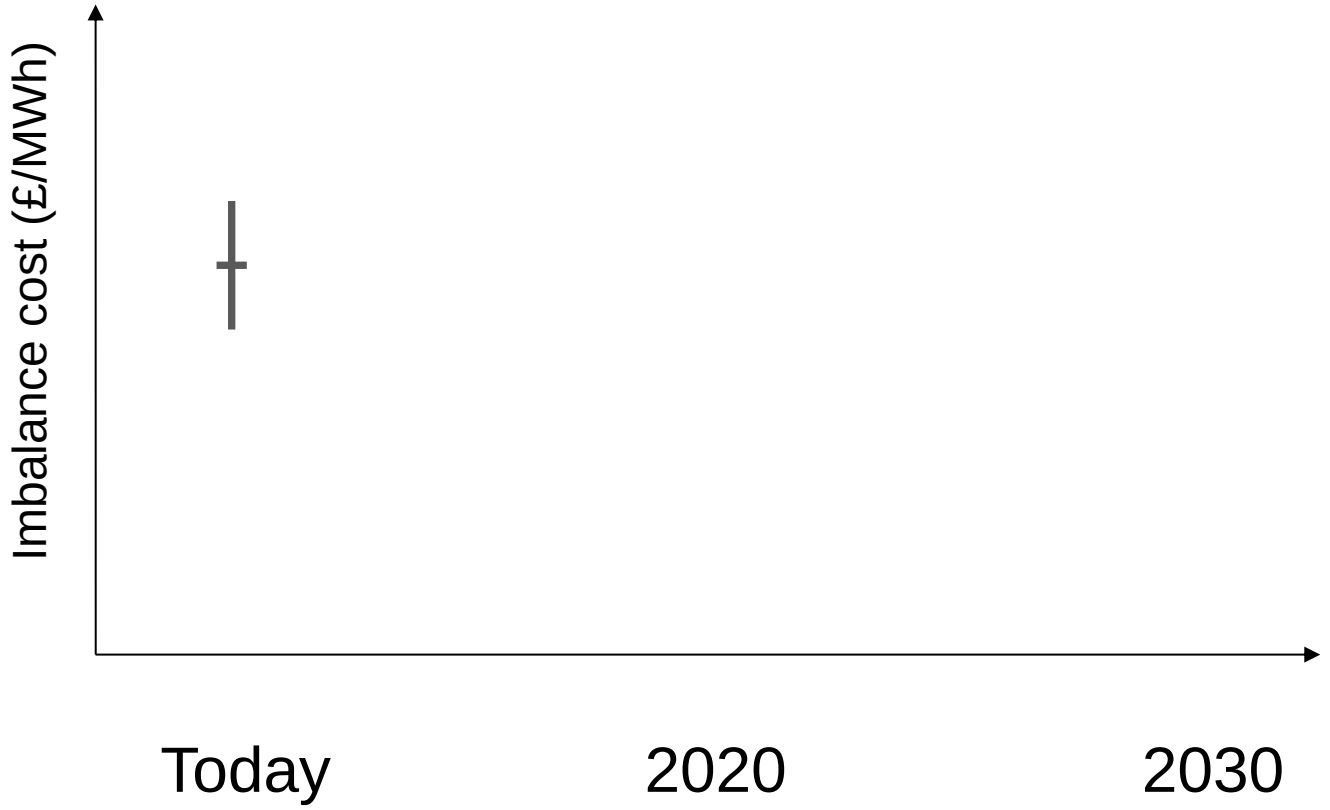
Imbalance Risk

- We define imbalance risk as the potential for increased costs associated with uncertainty around the expected level of imbalance cost
- The proposed metric is the difference between the mean (expected) and a 95th percentile worst case



Analysis goals

- Cost/risk today
- Asset type / portfolio



Analysis goals

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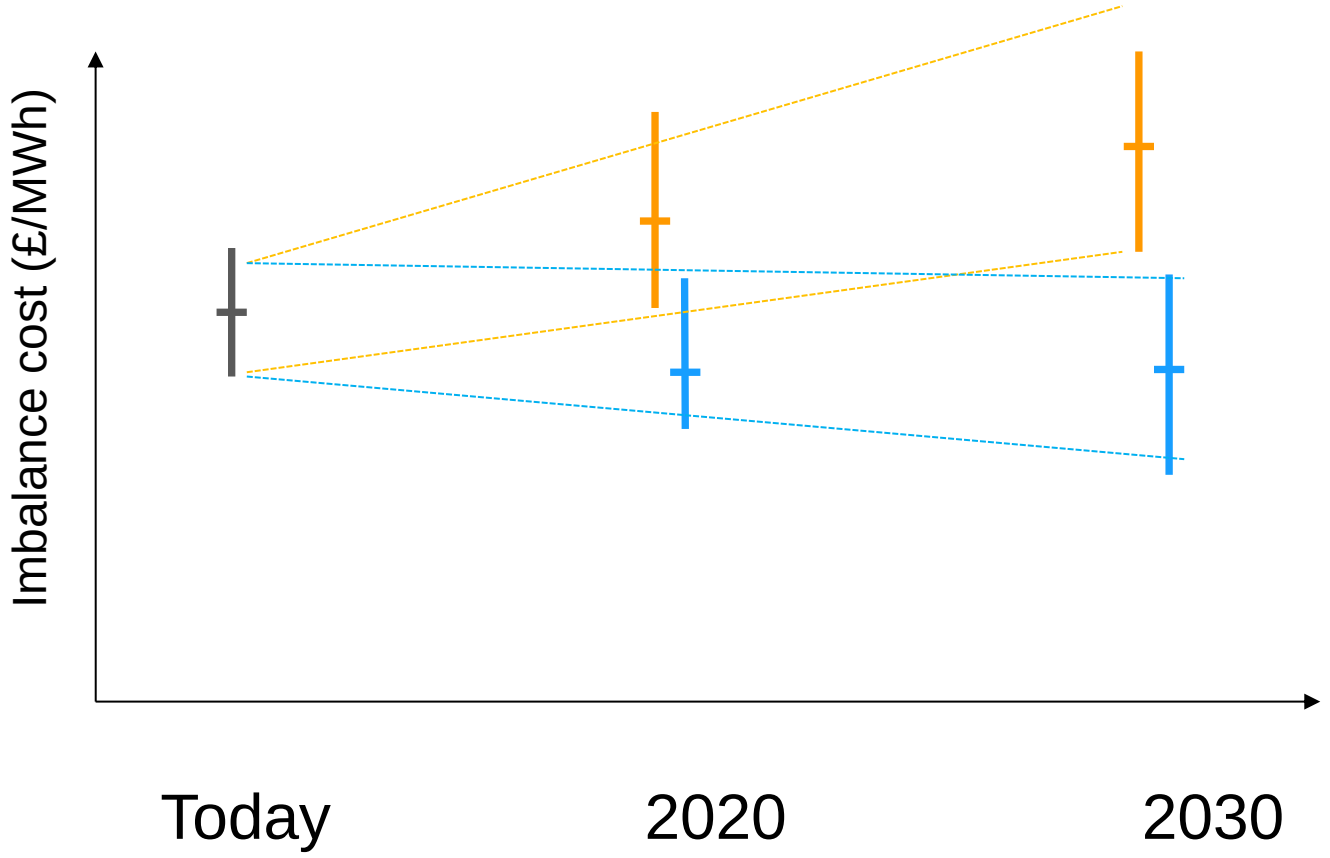
- Sensitivities on cost/risk under future scenarios



Analysis goals

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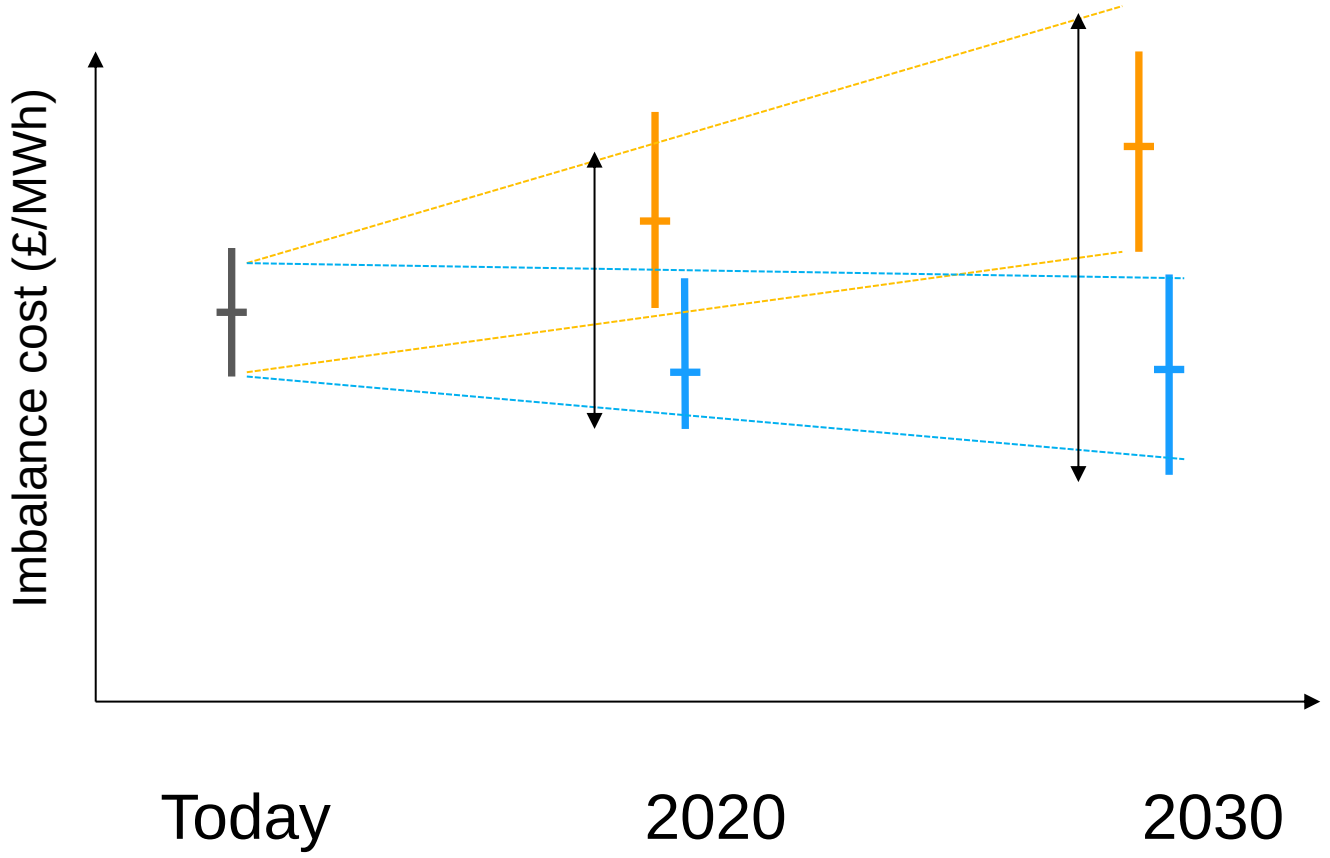
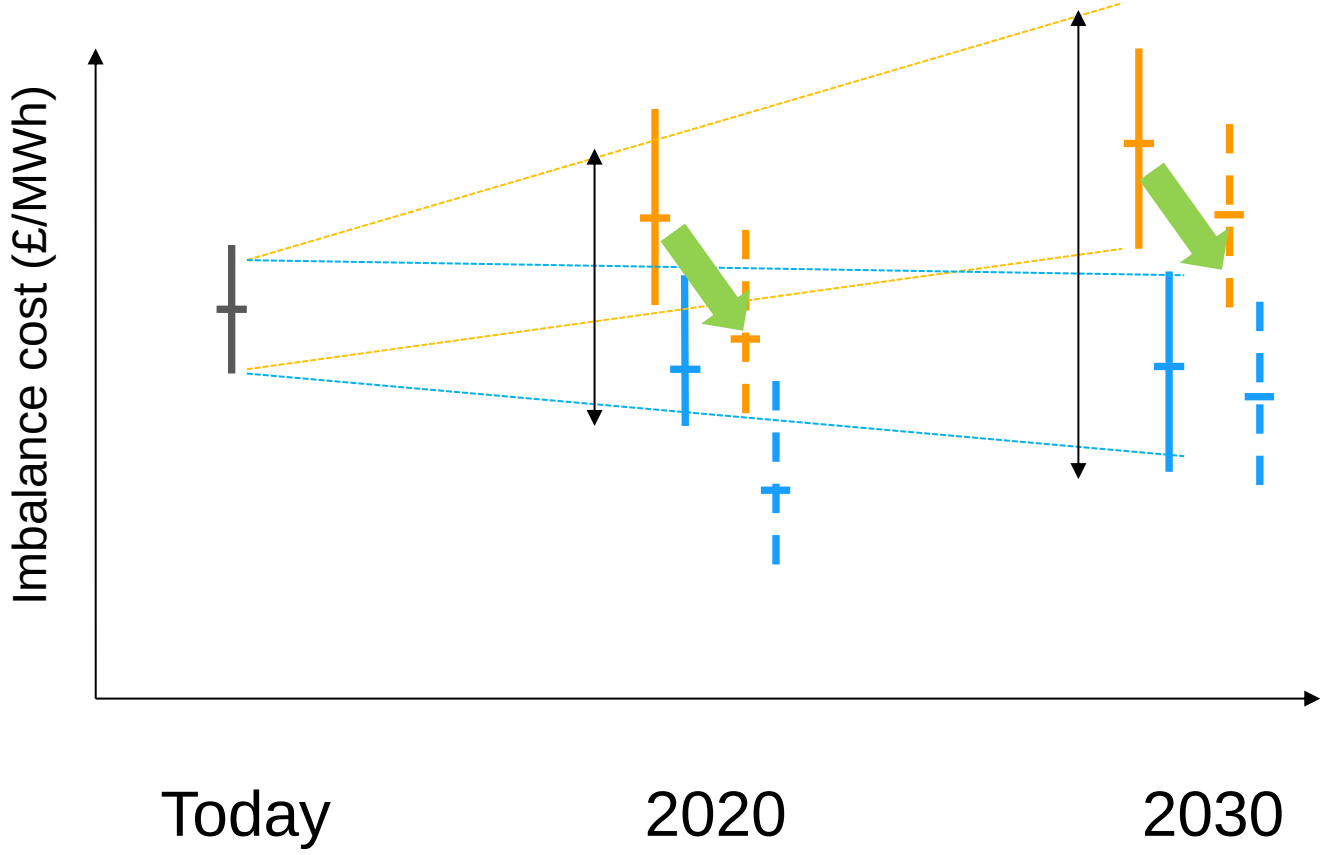
- Overall uncertainty

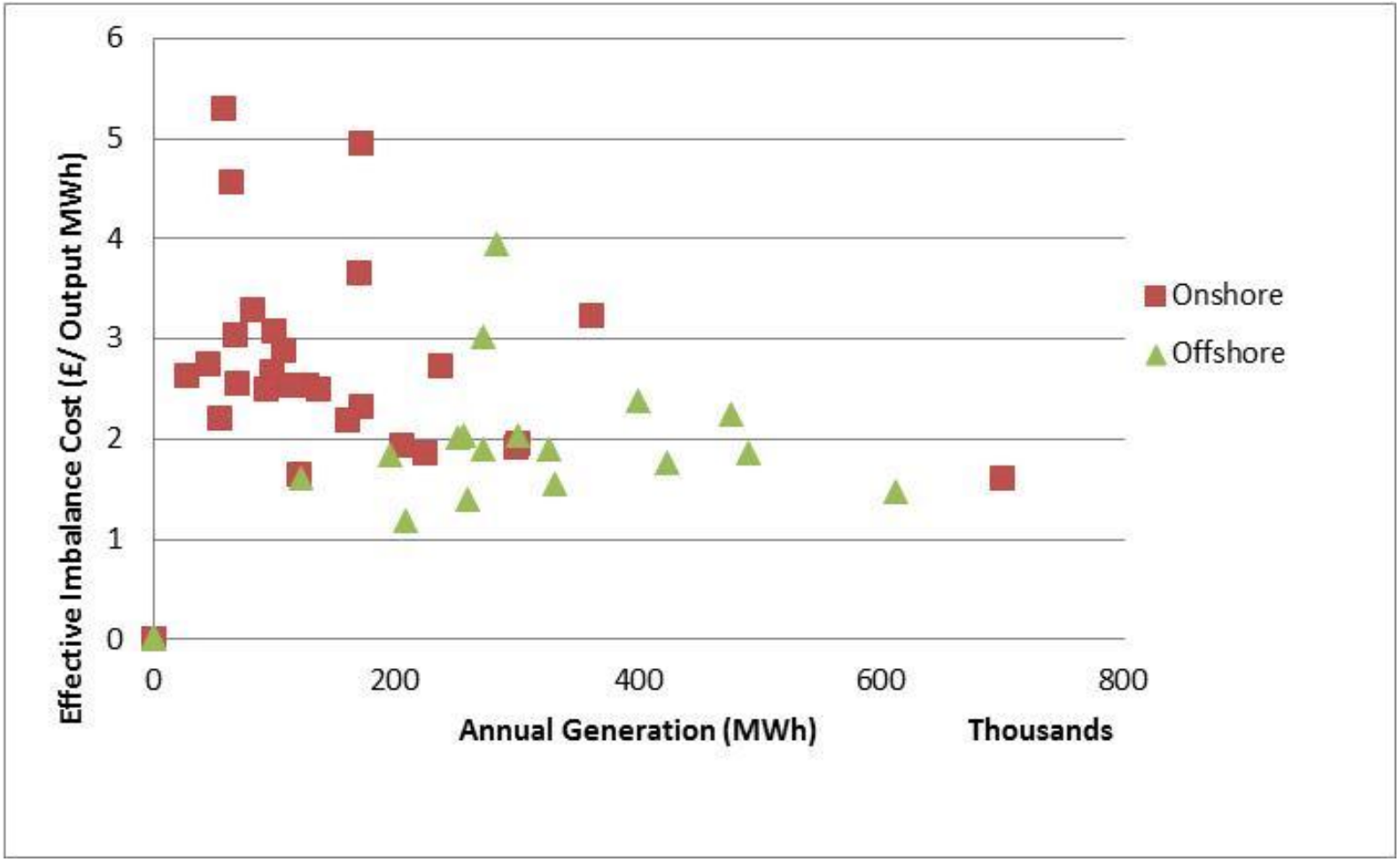


Analysis goals

- Cost/risk today
- Asset type / portfolio
- Sensitivities on cost/risk under future scenarios
- Overall uncertainty
- Potential benefit of forecast improvement

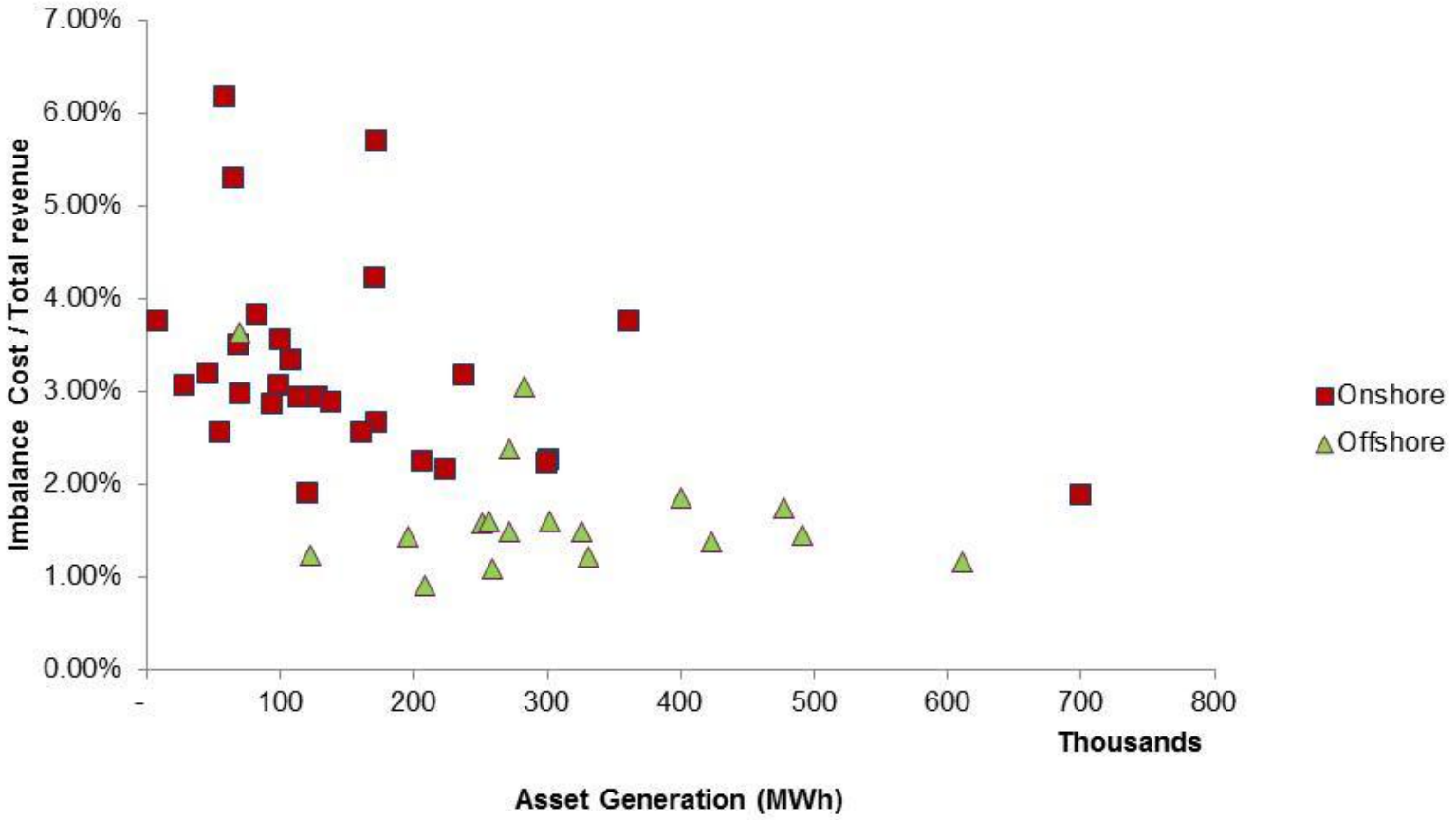


Historic imbalance costs
Onshore/offshore - 2012

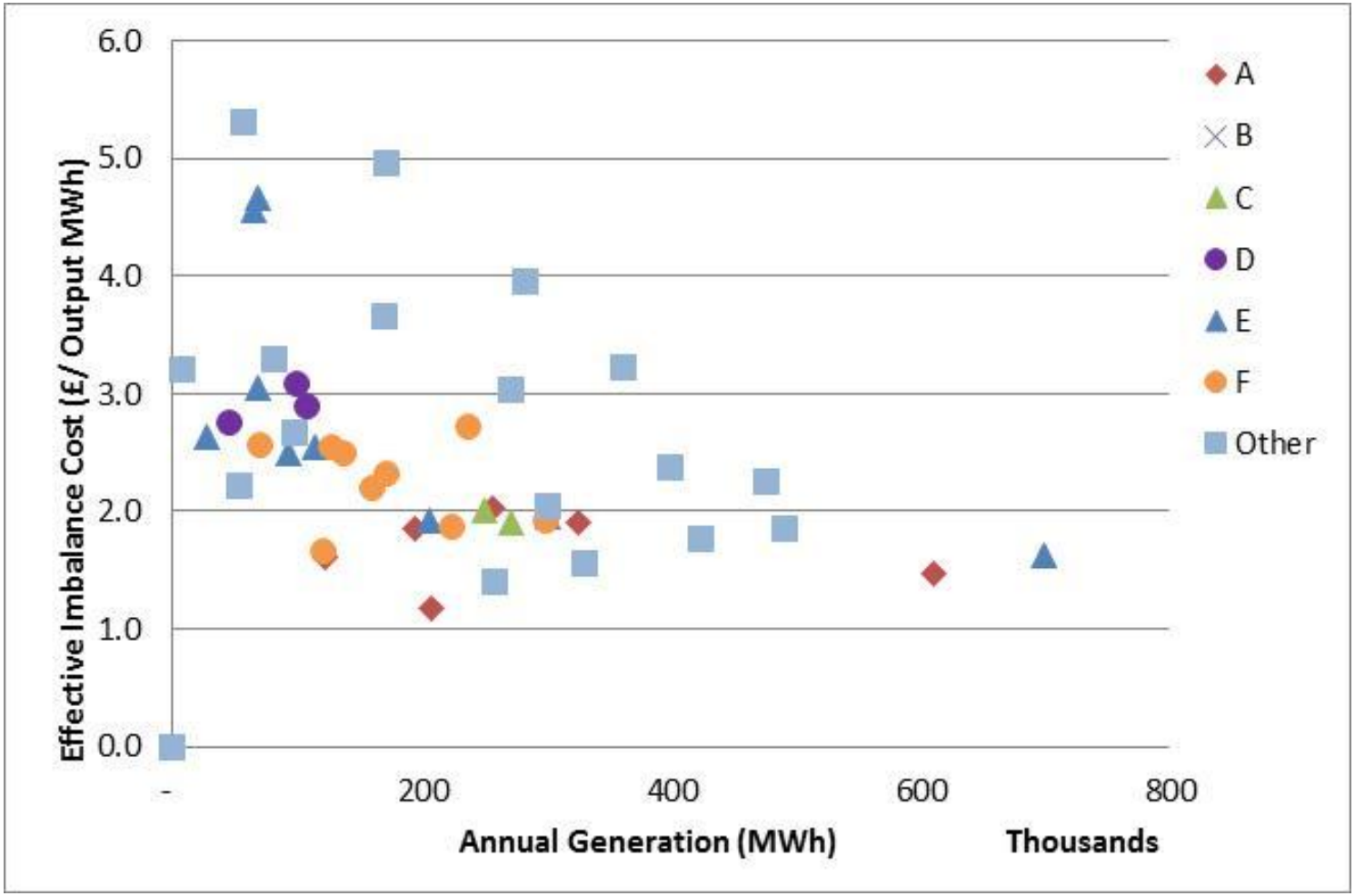


Historic imbalance costs

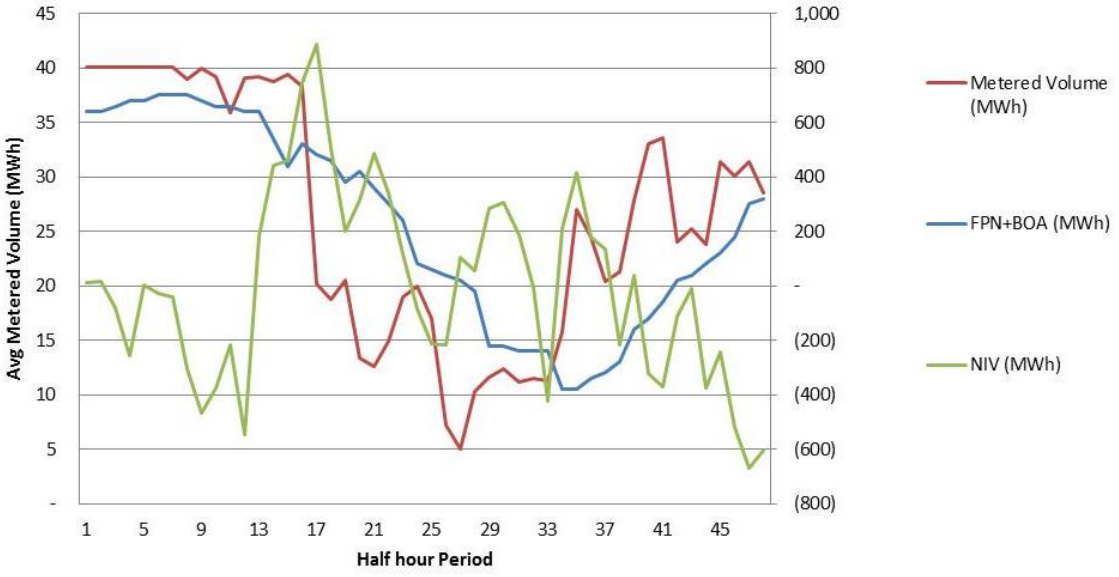
Materiality relative to revenue - 2012

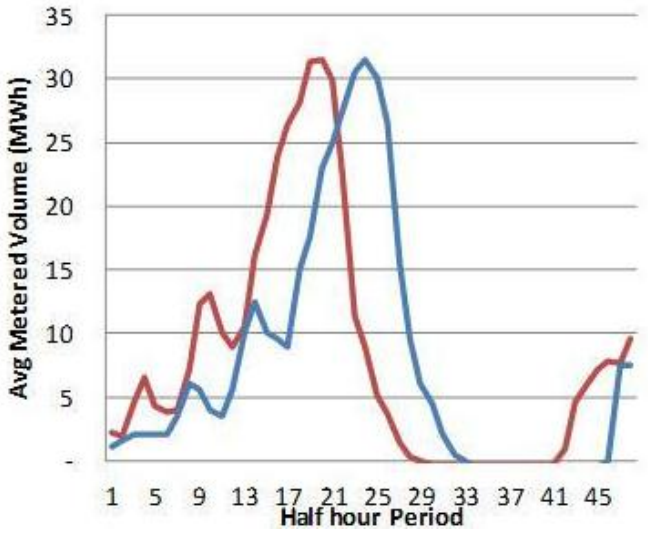


Historic imbalance costs
Company - 2012



Historic imbalance costs
FPN patterns





Historic imbalance costs

Key messages

- Significant spread in imbalance cost by BM unit
- Represents 1-6% of annual revenues at minimum
- Different FPN patterns reflected in spread of costs by company
- Independent generators show wider spread
- Relationship between asset size and imbalance cost
- Offshore costs lower than onshore on average
- 2011 shows similar pattern – on average slightly lower, potentially due to overall windier year

- Early simulation results show relatively tight distribution on annual basis for given asset / FPN pattern due to diversity effects across year

Future drivers

Directional impact on cost and risk

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Market fundamentals

- Higher wind deployment…… ↑
- Tighter capacity margin…….. ↑ ↓
- Higher levels of ROC/CfD plant… ↑
- Increased DSR…….. ↓
- Commodity prices…….. ?

Regulatory arrangements

- Increased interconnection… ↓
- … and EU Target Model…… ↓
- More marginal SBP/SSP…..…… ↑
- Single price……... ↓

- Longer term risk likely to be driven by uncertainty in fundamentals and regulatory outcomes rather than inherent risk within particular scenarios