DEVELOPMENT OF OUTPUT MEASUREMENT

Ofgem DPCR5 Workshop

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Outputs - background

- Electricity is a simple product
- Our service is essentially invisible
- Quality is effectively binary (on/off)
- We aim to be like a good referee – if it all goes well, no-one remembers our name…

- However,
  - Current output measures are essentially short-term in nature
  - Stewardship and risk have been too hard to measure
  - As a result, large areas of our investment essentially have no outputs
  - Many of the ‘hot topic’ areas have ill-defined outputs

Current arrangements

- Overall capex incentive – IQI
- Quality of supply to today's customers – IIS
- Losses
- Distributed Generation
- Drawbacks
  - Only looks at a few specific and short-term aspects of network risk
  - Largely ignores the medium and longer-terms
  - Based on average customers in normal conditions – doesn't look at extremes
  - Safety & Environmental aspects left to compliance with statutory responsibilities
  - No coverage of cost risk

Current arrangements

- A number of areas are not well-covered by current arrangements which will be part of longer-term strategies to manage and adapt distribution networks to 21st Century realities, eg
  - Worst-served customers
  - HILP
  - Resilience
  - Flooding
  - Fluid-filled cable replacement
  - Undergrounding
- As conventional outcome indicators wouldn't apply, DNOs would need to demonstrate;
  - Stakeholder support for volumes
  - Efficient delivery compared to agreed baseline
  - Baseline would need a metric

Potential output options

- We can count activity
  - Spend incurred
  - Physical units replaced
- We can measure performance
  - Levels of service experienced by today's customers
  - Number of failures, defects etc.
- We can analyse the state of the asset
  - Asset characteristics
- Harder, we can try to measure
  - Risk reduction
  - Whole life value
  - And other concepts that try to take a wider/longer-term view
- Quick review of the main investment areas

Load-related

- New Connections & Reinforcement
- Significant linkage with economic drivers
- Can involve large, one-off investment

Aim of investment	Meet future demands for connections and ensure security of supply
Extent to which under DNO control	Partially, largely driven by external factors
Predictability	High on overall trend, relatively low on specifics
External influences	Economic growth, demand patterns, climate change?
Key metrics	Substations out-of-firm, average cost of connection
Typical DNO forecasting approach	Trend analysis + major schemes for Connections, Modelling + system studies for reinforcement.
Previous Ofgem approaches	Marginal cost modelling, 15-year LRE cost to serve model
Possible Ofgem approach	Revenue driver?

Non-Load Condition-based

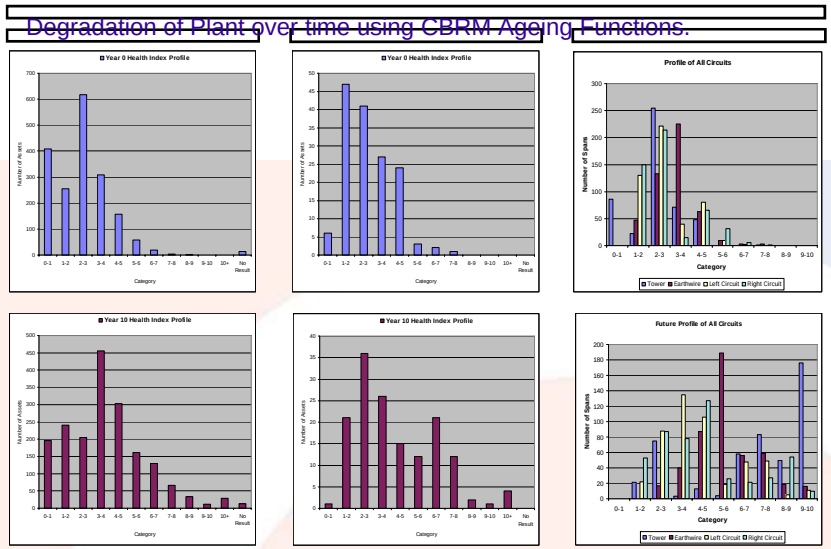
- Replacement of existing asset base
- Network is a complex of inter-related assets
- Risk profile varies from run-to-fail to preventative replacement

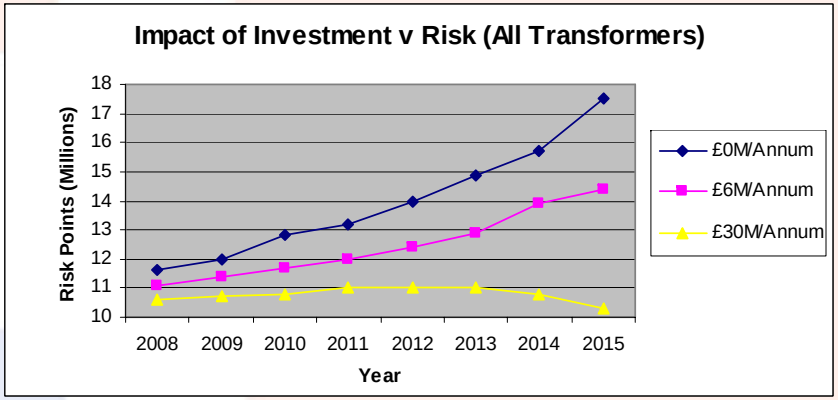
Aim of investment	To ensure network remains fit for continued service
Extent to which under DNO control	Almost fully
Predictability	Fairly high for visible assets. Fault rates only change slowly
External influences	Environment, patterns of usage, third parties etc.
Key metrics	Fault rates, condition, remaining life, residual risk etc.
Typical DNO forecasting approach	Based on asset-specific condition assessments + trend for non-assessed assets in short-term. Longer-term may use replacement curves.
Previous Ofgem approaches	Replacement curve modelling, either deterministic (DPCR3) or as a sense-check (DPCR4)
Possible Ofgem approach	Sense check modelling, audit of company own submissions

Potential non-load output options

- Improvements in data and methodologies allow new approaches to the existing network
- Health Index distributions
- Dynamic modelling through time
- Probability of failure analysis
- Criticality analysis
- Gives overall network risk profile

Degradation of Plant over time using CBRM Ageing Functions.





Non-Load Other

- Programmes to enhance aspects of the network, or reduce its impact
- Usually accompanied by external driver
- Likely to be physical counts

Aim of investment	To address specific compliance issues due mainly to incidental impacts of asset operation
Extent to which under DNO control	Drivers largely external. Scope assessment & interpretation of risk within DNO control
Predictability	Potential scope relatively predictable. Changes in legislative landscape tend to come with reasonable warning.
External influences	Prime legislation, DTI, HSE, EA etc. House prices, land agents etc. for Diversions
Key metrics	Output volumes, compliance failures etc.
Typical DNO forecasting approach	Specific programmes for specific areas – can't trade-off between although some overlap with replacement. Trend analysis & risk assessments.
Previous Ofgem approaches	Taken as read, considered at current levels, marked out for future consideration
Possible Ofgem approach	Programme-specific allowances

Non-Load Other

- Programmes held outside of main allowance due to either;
  - Uncertainty, or
  - Discretion
- Significant third-party impact
- Might be sensible to assess large schemes (eg >£10M) under this regime?

Aim of investment	To meet anticipated future legislative or societal requirements.
Extent to which under DNO control	Variable. Generally low as a response to an uncertain future cost pressure. Visual amenity a discretionary programme.
Predictability	Low by definition (re-openers). Visual amenity high although depends on DNO motivation.
External influences	Third parties, legislative developments, environmental lobby
Key metrics	Output volumes, compliance failures etc.
Typical DNO forecasting approach	Based on sample surveys, risk assessments etc.
Previous Ofgem approaches	Not included in main control. Either re-openers or logging-up items.
Possible Ofgem approach	Continue.

Non-Load Other

- DNOs could trade discretion for indexing of outputs in specific areas not covered by current incentives.
- It would also give some measure of protection (and hence stability for the rest of the programme) if major schemes were separated out for separate treatment
  - They do not fit well with the incremental-type models generally used by consultants to assess appropriate capex
  - They have historically exhibited greater cost growth than the main programme
  - They are often subject to external factors and agencies beyond the direct control of the DNO
  - Cost variations tend to impact on the main programme as budget re-allocations are made due to all programmes being funded from the same allowance.

Non-Load Other

	Base Case	Base Case Major projects	Own case
Form of submission assessment	Comparative	Specific scheme review	Specific programme review
Contract form	Sliding scale	Fixed price with variations	Fixed price with variations
Uncertainty	Specified re-openers	Log up/down adjustments	
Output	Incentive outcomes	Specified network outcomes	Specified physical activities
Delivery efficiency	Underspend tolerance	Unit costs?	Unit costs?
Funding	Base Allowance	Base Allowance + adjustment mechanism	Log-up with WACC adjustment

Summary

- Current output regime is short-term in its outlook
- Underlying asset health has been difficult to measure
- Output choice needs to facilitate assessment of efficiency at;
  - Point of submission (and hence to IQI)
  - Point of delivery
- Output measures can be proxies for deeper (but more elusive) indicators, eg risk
- Sometimes counting work completed may be appropriate