

Wind Integration – an overview of relevant Common Quality work streams

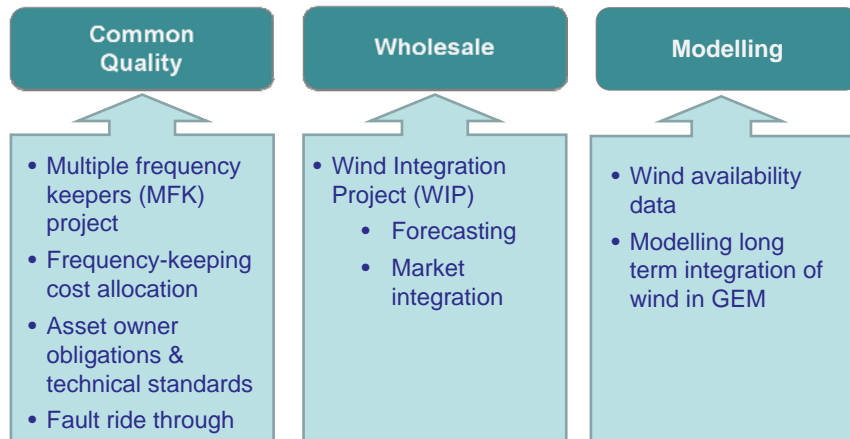
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Presentation to the Wind Integration Workshop
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1. Outline

- Overview of wind integration across the Electricity Commission
- Update on key common quality work streams
 - Multiple frequency keepers (MFK) project
 - Frequency-keeping cost allocation
 - Asset obligations and technical standards review
 - Fault ride through
- Timetable

2. Overview of wind integration work



3.1 Multiple frequency keepers - overview

Drivers:

- limited competition
- Potential increase in MW band
- Potential increase in response

Project description:

- Split up the band
- Central frequency control
- National frequency keeping market

3.2 Multiple frequency keepers - roles

Commission's Role: Facilitate

- Project structure (industry steering group and technical group)
- Contract with System Operator
- Agreement with Grid Owner (HVDC)
- Co-ordinate industry (TSG)
- Develop rules



3.3 Multiple frequency keepers - project overview

- First stage:
 - Develop centralised frequency control system, single provider – **currently in progress**
 - Modify dispatch systems
 - Modify generator station controls
- Second stage:
 - Multiple providers
 - National market using HVDC
 - Co-optimised with energy and reserves

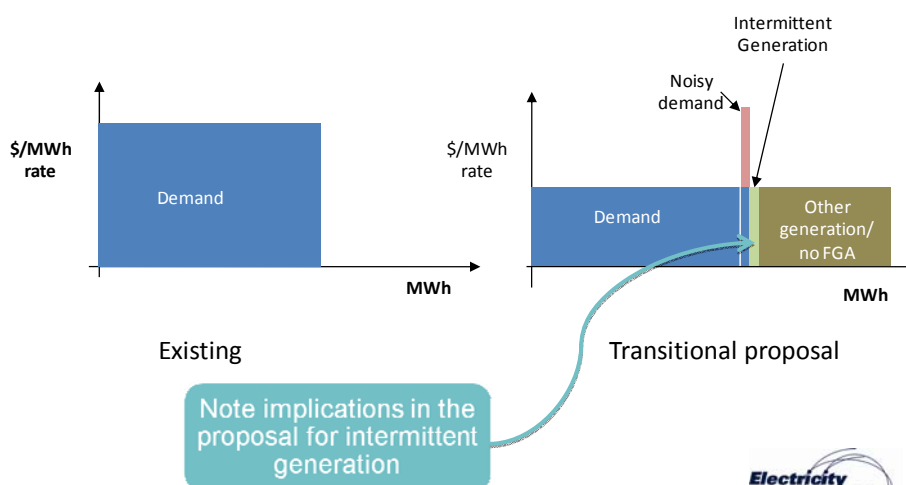


4.1 Frequency keeping cost allocation review - overview

- Current Methodology:
 - FK costs recovered from retailers / purchasers
 - based on share of national energy purchases
 - reflected view that demand variability was the primary driver
- Proposed Methodology:
 - Consultation paper proposes new methodology
 - to better target key contributors to FK needs
 - transition pending other work (eg MFK project)

Consultation closed 31 July

4.2 Frequency keeping cost allocation review - proposal



5.1 Normal frequency AOPO review - overview

- Appropriate standards
 - compete on equal terms
 - dispensation regime for non-compliant generation
- Linked to FK cost allocation review
 - costs allocated to non-compliant generation
- Consultation paper proposes revised standards
 - to ensure level playing field for investments
 - to clarify some existing obligations

Consultation closed on 31 July

5.2 Normal frequency AOPO review - proposal

Generating units should operate under free (unrestricted) governor control



Generating units, their control systems/speed governors (or equivalent) should not hold characteristics that reduce effectiveness of speed governor

6.1 Fault ride through - overview

- Recommendation from WGIP that dynamic voltage performance obligations be added to the Rules
 - Issues:
 - Synchronous generation is being displaced with wind generation that has different dynamic behaviour
 - Performance of wind generation during faults varies depending on whether it is FSIG, DFIG or FSFC
- Approach is to specify an over and under-voltage ride through envelop for all types of generation

6.2 Fault ride through - rules development progress

- Work completed by the System Operator:
 - Review of the dynamic voltage performance envelopes used in other jurisdictions
 - Protection performance assessed and motor load models developed
 - Detailed dynamic studies completed for all transmission voltages in the North and South Island
- Commission to complete preparation of consultation paper and complete rule change steps

7. Overview of timetable

