Aggregation in the NEM

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AEMC workshop on aggregation of ancillary services loads
27 Apr 2012
Data: 20 millisecond frequency samples recorded in Wellington during North Island UFE on 9 Dec 2011.
Under-frequency event in New Zealand

Data: 1 second meter data from 79 devices which responded to North Island UFE on 9 Dec 2011.
It’s not that difficult

Source: AEMO Customer and Generator Registration Guides
Contingency FCAS from non-scheduled loads

- Trapezium not relevant
- SCADA not required by AEMO
- No interaction with market meter
- No interaction with MSATS

Manual processes:
- Approval & classification/registration of new facilities
- Post-event performance verification
What is required?

- A market participant able to submit bids
- A market participant able to be paid by the market
- There’s no reason this needs to be a Customer or a Generator
- We could have an Aggregator participant
Different participants are responsible for different services at the one connection point.
Lesson from NZ: meter close to load

Distribution network

Supply points / connection points

M1
M2

Load 1
Load 2
Load 3
Load 4
FCAS load
Lessons from NZ

- Meter close to controlled load
- 1 second meter data suffices for verification
FCAS programmes rarely work alone

- Enablement is expensive
  (especially if you over-specify the measurement requirements)
- Ancillary services prices are usually low
  (NZ and Alberta are exceptions)
- FCAS is typically an add-on to an energy DR programme
Sale of demand response in the spot market
Embedded generator (not spot market exposed)
Embedded market generator (already happens)

Energy Consumption (MWh)

Retail FRMP

Load

NMI 1 (parent)

NMI 2 (child)

Demand Response FRMP
Do we need the generator meter?

Dispatch times known

Energy Consumption (MWh)

Retail FRMP

Load

Demand Response FRMP

NMI 1 (parent)

NMI 2 (child, deduced)
Do we care whether the resource is a generator?

Dispatch times known

NMI 1 (parent)

NMI 2 (child, deduced)

Retail FRMP

Normal Load

DR

Demand Response FRMP
Straw man data flow, if scheduled
Straw man data flow, if unscheduled

Provider

| M_B |

MDP

Retail FRMP

DR FRMP

Boundary meter data

Inferred DR meter data

Dispatch instructions

Dispatch instructions