



GMT Flexibility Market Roadmap



May 2022

Transpower Demand Response Programme

Premise

Transpower's Demand Response Programme was an investigation into DR's viability as a transmission alternative.

- The Commerce Commission requires consideration of Non-transmission Solutions (NTS).
- Value of lost load (VOLL) was at the time (2007-2013) the default NTS option. Considered a 'do nothing' option at \$25k/MWh.
- Our grid investment team's demand forecasts were seeing a wider range of scenarios than ever before due to energy efficiency, new technology, electrification. Flattening of demand growth making it more difficult than ever before to determine when to invest.
- DR was identified as an option.
- However... we knew very little.

Transpower Demand Response Programme

2007-2013

- We ran a trial in 2007 and had learned a few key lessons, eg we needed a platform and that we needed to reduce barriers to gain more uptake and put downward pressure on price.
- Learnt from PJM - operational process (registration, event calls, baselining, settlement).
- Tendered for a Demand Response Management System (DRMS). Selected the same DRMS as PJM.
- Unlike PJM, NZ does not have a capacity market, so we needed an adaptation of their DR product designs as well as create our own procurement process.
- Goals of the investigation impacted our DR product and procurement designs:
 - Price Responsive Programme (Adaptation of PJM Economic Programme).
 - Non-Price Responsive Programme (Adaptation of PJM Security Programme).

Transpower Demand Response Programme

DR Programme Goals

- **Price discovery**
 - Overarching goal to have as a key input into our grid investment test.
 - Tenders run for both product types. Price was not given to participants, only the types of fees on offer, ie Establishment, Event (\$/MWh), Availability (\$/MW/month)
 - Price points for event fees were discovered from test calls.
 - We used “pay as bid” for our call prices to improve liquidity (now we could use marginal price)
- **Reduce barriers to entry**
 - Min DR block size was 2kW (although we actually accepted smaller!).
 - Created a slimmed-down contract based on our Grid Support Contract.
 - Price Responsive Programme designed so that end users did not need an aggregator. Based on 2007, aggregators made the cost of DR uneconomic and it was also a barrier to entry for some new participants to have an agreement with an aggregator.
 - Programme was built more around offering carrots – there were no sticks.
 - Created a mobile app for easy participation/notification of events.

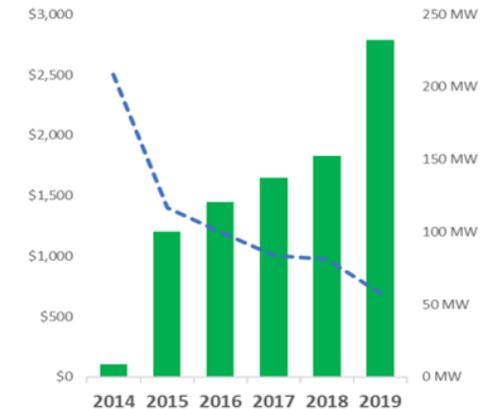


Transpower Demand Response Programme

Key Findings

- Over RCP2 the development and viability of Special Protection Schemes (SPS) as NTS for Transpower was strong, significantly better than VOLL and out performed DR price points for N-1 assets.
- For N assets, post contingent SPS schemes are not viable, DR is a more viable option. There is greater value for investment deferral.
- Different price points were discovered for different technology types.
- Ideally Flex Traders would run flexibility programmes and Transpower would procure the transmission deferral services off them. They are in the best place to manage customers, the local network issues and respond to grid needs when called upon.
- EDBs/Transpower still look at building/buying own flexibility solutions via capex rather than tender for flexibility services
- Emergence of batteries as a flexibility resource would work best under a tariff structure and/or dispatch mechanism that could be triggered by Flex traders.

Price/MWh MW capacity



\$695/MWh

Average event price in 2020

2,000

Total batteries

232 MW

Registered in programme

Transpower Demand Response Programme

Flexibility Contracts

- Transactions costs must be low for flexibility sellers/traders
- Product definition must be well defined, not reinventing the wheel every RFP. Standard contract terms for each flexibility product type.
- Ability for flexibility sellers/traders to register assets anytime before an RFP
- Standardised baseline methodologies – to reduce transaction costs and confusion of flexibility sellers/traders trying to comply with different baseline types for the same flexibility product across different flex buyers.
- Easy access to meter data – one of the biggest barriers to participation...
- Metering data formats should be standardised but the source of the metering data should not be locked behind only ICP revenue meters.



What was the most surprising thing learned about transacting flexibility during the trial?

- Flexibility sellers/traders difficulty on setting/knowing their own price point – how to value things in terms of \$/MWh rather than \$/M², \$/L \$/hr etc
- The want for certainty – Number of event calls * average length * \$/MWh + Any Establishment or Availability fees.
 - A seller would prefer a flexibility product that is explicit in its annual value.
 - This could mean developing products with a higher weighted focus on availability fees than on event fees.

What is your view of the most important thing to get right up front to successfully transact flexibility?

Standardised Flexibility Products

- Use cases each are procured under and considered under investment tests.
- Prices set by flexibility buyers for procurement process. Cost of cheapest Capex option used at the input of the prices created in a Flex product procurement process.
- Moving away from being descriptive of the need and more prescriptive of the solution.
- Procurement of these products is centralised (eg Piclo in UK) to reduce transaction costs incurred by flexibility providers.
- Flexibility product contracts have standardised sections across all EBD contracts. – Also to reduce transaction costs incurred by flexibility providers.

Shared Industry Flexibility Vision, Roadmap and Leadership.

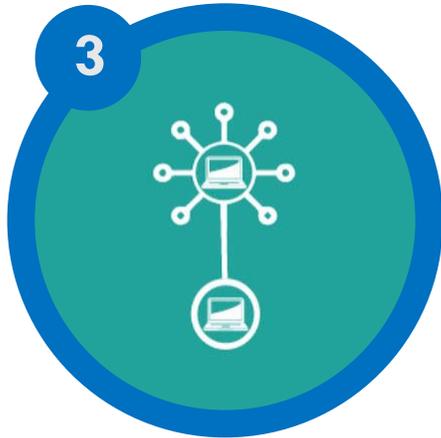
Flexibility Futures



Flexibility Futures



Outcome - Flexibility Roadmap



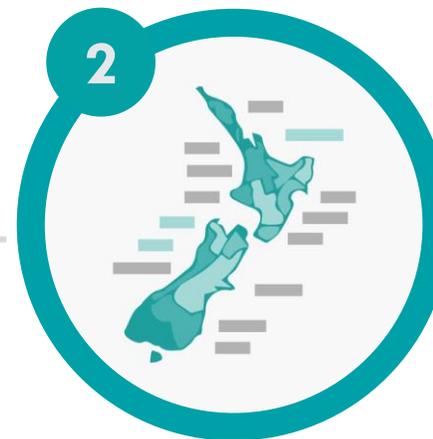
NZ Flexibility Market

To help industry and government decide on a vision and act towards a pathway of least regrets.



Flexibility Futures

Vision & Principals
Target Operating Models Developed
International Review
Initial Industry Consultation
Cost Benefit Analysis
Co-Developed Whitepaper



Outcome - Flexibility Roadmap

Industry and Government Understand:

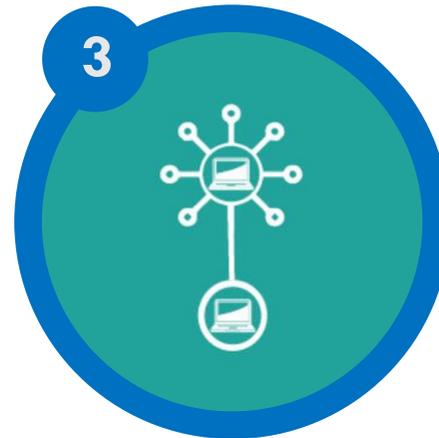
- Which model of flexibility market is most optimal
- Why other models are sub optimal

So that they:

- Support or not oppose changes to the Code & Market Design that enable the optimal market structure
- Implement processes that unlock value streams within that market structure



Future Outcome



Future Flexibility Market Design

Implementation of Target Operating Model

- Systems & Processes
- Code Changes
- Realise Whole-of-System Benefits
- Unlock value of DER for EDBs, Transpower and Wholesale Markets
- Efficient outcomes for security of supply - SO coordination of DER

Flexibility Futures



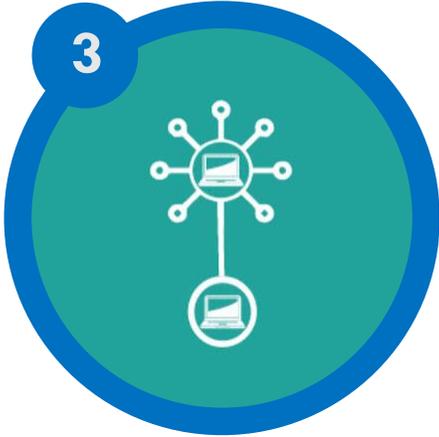
Flexibility Futures

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- Target Operating Models Developed
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- Whitepaper



Outcome - Flexibility Roadmap

- Government Ownership of preferred future state
- Potential Workstreams/ Investigations/Trials
 - DER Registry
 - DER Procurement - Flexibility Marketplace
 - DER Wholesale Market Integration
 - DER Operating Envelops
 - DER Passive and Active Forecasting
 - DER Market Portal



NZ Flexibility Market

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