

An aerial photograph of a dense green forest. Several ziplines are visible, stretching across the scene. On the right side, two people are ziplining, suspended from a cable. The sun is shining from the upper left, creating a warm, golden glow over the forest. The title text is overlaid in the center of the image.

NATIONAL MARKET FOR INSTANTANEOUS RESERVES (NMIR)

DAVID KATZ

DEAN EAGLE



TRANSPower

TOPICS

- NMIR Objectives
- NMIR Observations and Insights
 - Price separation
 - Case comparison
- Schedule Differences
- Questions

NMIR OBJECTIVES

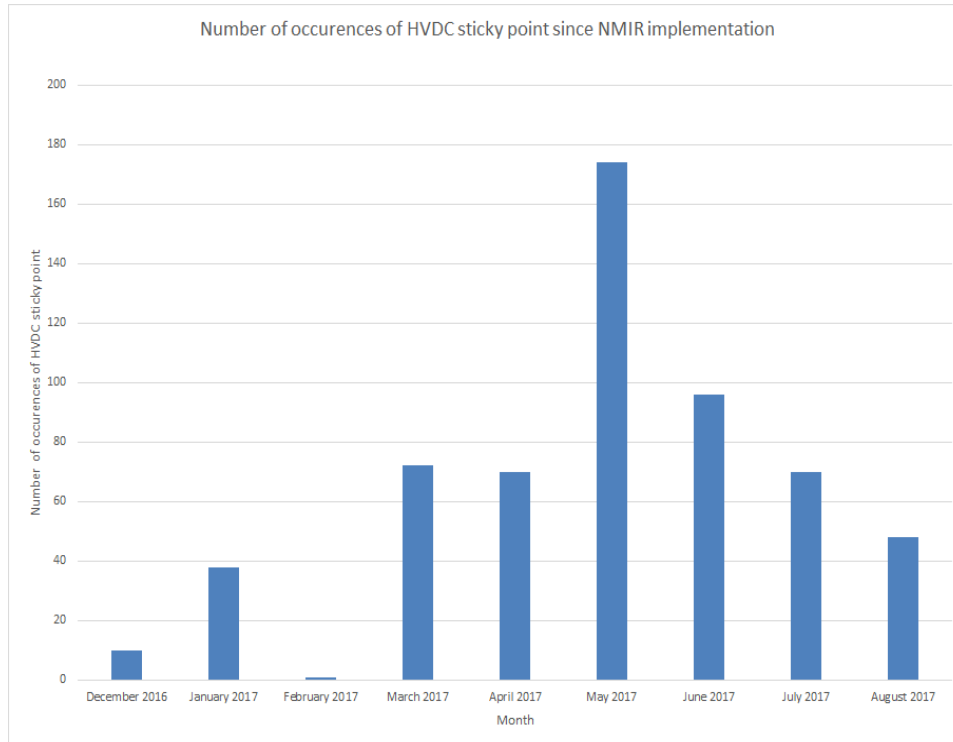
Designed to

- ✓ reduce quantity of IR procured
- ✓ access lowest price IR
 - procure reserves to cover the HVDC from the receiving island
 - share AC Reserves nationally

PRICE SEPARATION WITH NMIR - WHAT'S GOING ON?

- Some market stress observed due to recent dry winter conditions
- NMIR vs Island based reserve market always results in a cheaper combination of energy *and* reserves (even if its difficult to see what's happening at times!)

HVDC STICKY POINTS



HVDC STICKY POINTS

- The HVDC can “stick” at 22.5MW of transfer north or south to gain the economic benefits of increased reserve sharing in roundpower when:

The benefit of staying in roundpower to utilise comparatively cheap receiving island **FIR** offers

Is greater than

The benefit of moving outside roundpower to utilize comparatively cheap sending island **energy** offers

We get energy price separation between the islands due to procuring more energy from the receiving island to stay at 22.5MW.

HVDC STICKY POINTS

- From the 18:30 trading period on 12th July:
- DCS 22.5MW
- NI reference price \$116.75/MWh
- SI reference price \$891.04/MWh

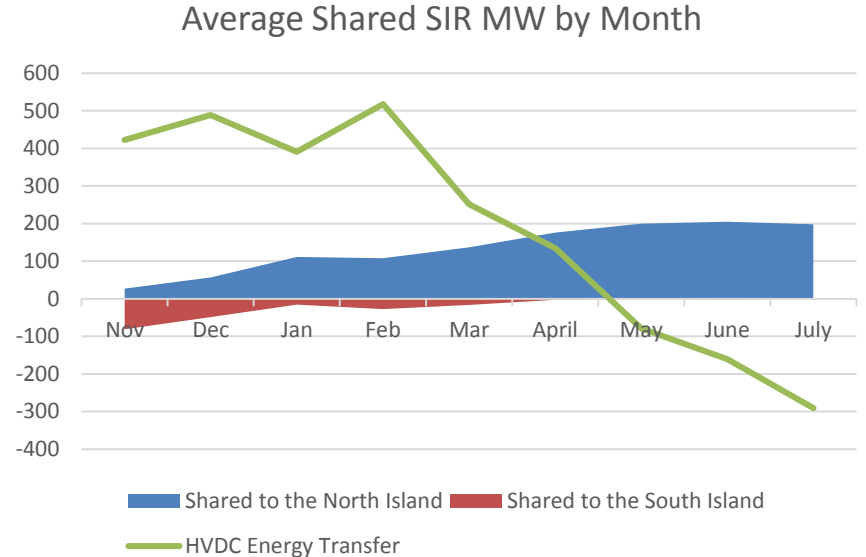


- Without reserve sharing
- DCN 55MW
- NI reference price \$903/MWh
- SI reference price \$896/MWh

Total Type	TP 38
	18:30
Total IPS MW	6332.93
NIPS	4142.34
NI Ref Price	116.75
SIPS	2190.59
SI Ref Price	891.04
Total NI FIR	117.47
Total SI FIR	188.72
Total NI SIR	189.33
Total SI SIR	220.00
DCN	0.00
DCS	22.50
NI Wind + IG Total	0.00
SI Wind + IG Total	0.00
NI DD Bids Uncleared	0.00
SI DD Bids Uncleared	0.00

OBSERVATIONS – HIGH LEVEL

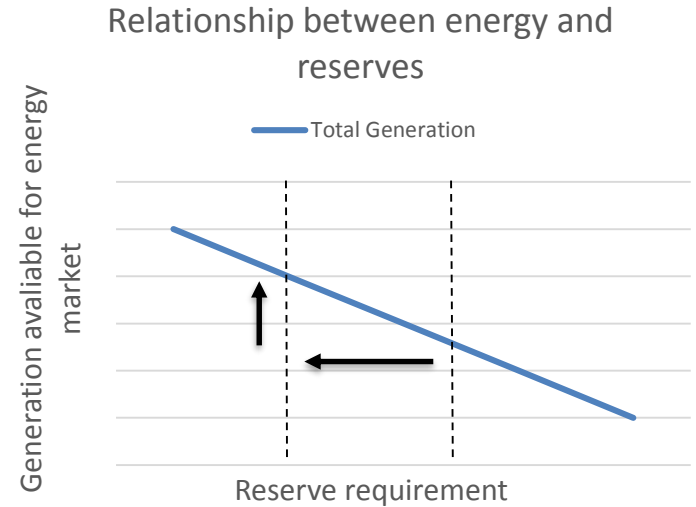
- Reduction in cleared reserves.
- Average shared reserves per trading period 88 MW FIR, 150 MW SIR
- Recent observations has seen reserves typically shared opposite to energy transfer.
- Reduction in reserve quantity not necessarily leading to reduction in reserve costs
- Does lead to optimal solutions for energy, particularly during times of system stress



OBSERVATIONS – HIGH LEVEL, BENEFITS

Week ending 16th July – Stress on the system

- Compared cases with and without reserve sharing.
- More generation available for energy
 - Lower production cost \$66k
 - Lower average prices \$66 per MW
 - More south transfer 2.8GWh over the week
 - Optimal outcome



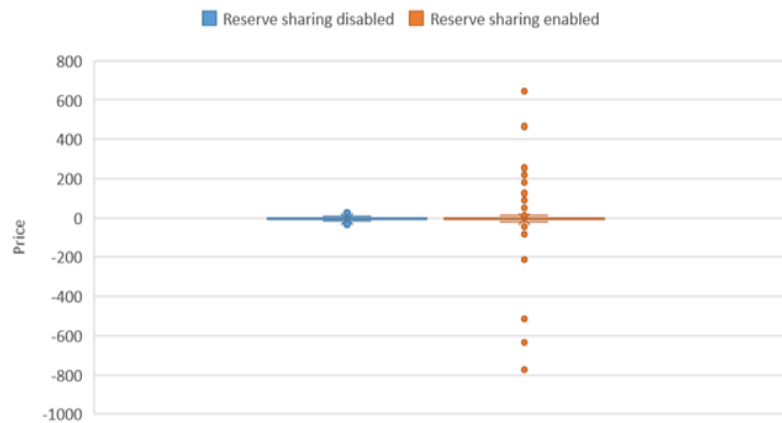
OBSERVATIONS – HIGH LEVEL, VOLATILITY

Price volatility – *More constraints to get more utilisation of HVDC leads to more price volatility.*

- Non linear nature of reverse reserve sharing constraints with HVDC Energy transfer.
 - Most likely during low HVDC transfer.
 - Particularly noticeable over peak load periods.
 - Particularly with south transfer as the North Island has higher risk.
 - Benefit is greatest when volatility is greatest.

12 th July 18:30 TP	NI Price	SI Price
With Sharing	\$117/MWh	\$903/MWh
Without Sharing	\$891/MWh	\$896/MWh

Spread of Island price separation with and without reserve sharing



SCHEDULE DIFFERENCES

	NRS	RTD	RTP	FP
Initial MW	Unit sample for start of each TP	Current MW (DC last dispatch)	MW at the start of 5mins	Unit sample for start of each TP
Island Load	LF	Generation – losses - PSD	5min average of actual load	Metered Load
DD	yes	no	yes	yes
NFRs	Latest RMT solve	Latest RMT solve	Latest RMT solve	Latest RMT solve at the start of TP
IG	Latest offer	Offered MW = 9999 Up ramp = 0 Initial MW = SCADA current MW	Offered MW = 9999 Up ramp = 0 Initial MW = SCADA previous 5 mins average	Negative load

SENSITIVITY SCHEDULES

- Market participants are not aware of the degree of sensitivity of price to fluctuations in demand (and/or intermittent generation).
- Idea proposed is to supplement pricing information with indicative pricing based on variation in the demand forecast which will provide some insight into price sensitivity.
- Delivery of this type of service is dependent on viability, a positive CBA and approval by the Electricity Authority.
- If this were to proceed to delivery it would need to be incorporated into our workplan and as such would be some time away from becoming a reality.