Proposed actions to correct the 2019 UTS

James Tipping, Chief Strategy Officer

18 March 2021

Agenda

- **Welcome** - introductions
- **Housekeeping**
- **Opening remarks**: James Tipping
- **Technical briefing**: Christie Smith
- **Questions and Answers**

House keeping

- Zoom etiquette
  - Please raise hand (physical or digital)
  - Please stay on mute (unless speaking)
  - Please wait for us to repeat your question into the mic
- Publication of:
  - Visual briefing materials
  - Recorded event

Recap: the 2019 UTS claim

An undesirable trading situation (UTS) is a situation that threatens, or may threaten, confidence in, or the integrity of, the wholesale market.

UTS : situation cannot be resolved under any other part of the Code

Dec 2019 – extreme weather event and unprecedented circumstances (“confluence of factors”)

- Record level inflows
- Planned HVDC and Pohokura gas field outages
- Contact’s new automated spill gates for the first time during a flood event
- Meridian withholding generation in the Waitaki, by pricing it very high.
- Genesis operating as a price taker in the South Island.

Confidence in the market may have been threatened

December 2020 – Authority decides a UTS occurred **3-27 December 2019**

Between 3 and 27 December 2019 market outcomes significantly different because:

- **Confluence of factors** *led to*
- **Reduced competition,** *which allowed*
- **Excess spill** and **high prices** *despite* underlying conditions
- **Scale** and **duration** of significant magnitude

Next steps: actions to correct

- The Authority must attempt to correct UTS and restore normal operation of the market.
- The Authority may take any action it considers necessary provided that it relates to an aspect of the electricity industry that the Authority could regulate in the Code
- March 2021: Proposed Actions to Correct: Undesirable Trading Situation 2019
- Proposed option to reset final electricity prices (similar to 2011 UTS action)
- Submissions close 5pm Tuesday 27 April 2021 – followed by 3-week cross submissions
- Final paper: aiming for decision in August 2021.

Monitoring and compliance programme

Authority market review

- Authority noticed spilling activities and opened a market review on 11 December 2019
- Market review paused during UTS investigation – to resume after actions to correct

Compliance investigations

- Separate compliance investigations into alleged breaches of the high standard trading conduct provisions in the Code
- Investigations near completion

High Standard of Trading Conduct (HSOTC)

- Proposed reform of HSOTC – consultation closes 23 March 2021
- HSOTC "proposed provisions" – aim to clarify expected behaviours

Proposed actions to correct the 2019 UTS

Technical Briefing

18 March 2021

Christie Smith, Senior Economist

Roadmap for today's presentation

- Describe the UTS and Part 5 of the Code
- Summarise the proposed Actions to Correct (ATCs) and their rationale
- Summarise outcomes (prices, cost of electricity, HVDC transfer)
- Answer questions

Actions to correct in Part 5 of the Code

- Must attempt to correct every UTS and restore the normal operation of the wholesale market as soon as possible (5.5)
- The Authority may take any action it considers necessary provided it relates to an aspect of the electricity industry that the Authority could regulate under the Code (5.2) –
- …directions given to participants can be inconsistent with Code but must be consistent with the Act / law
- Have to consult with system operator if the action may affect system security (5.3)
- Must consult with affected participants before taking any action to correct the UTS, unless impractical to do so (5.4)

About ATCs – Objectives, etc.

- Aim to correct the UTS and restore normal operation of the market rather than being a punitive mechanism
- ATCs focused on correcting the UTS that occurred (in 2019)
- ATCs not backdoor replacement of Code amendment (to ameliorate/forestall similar future events or to fix inherent features of market design)
- No time machine. ATCs are necessarily approximate – cannot perfectly replicate all market processes that would have been used in the absence of the UTS; cannot identify all consequences or correct all outcomes

Direction of travel to date

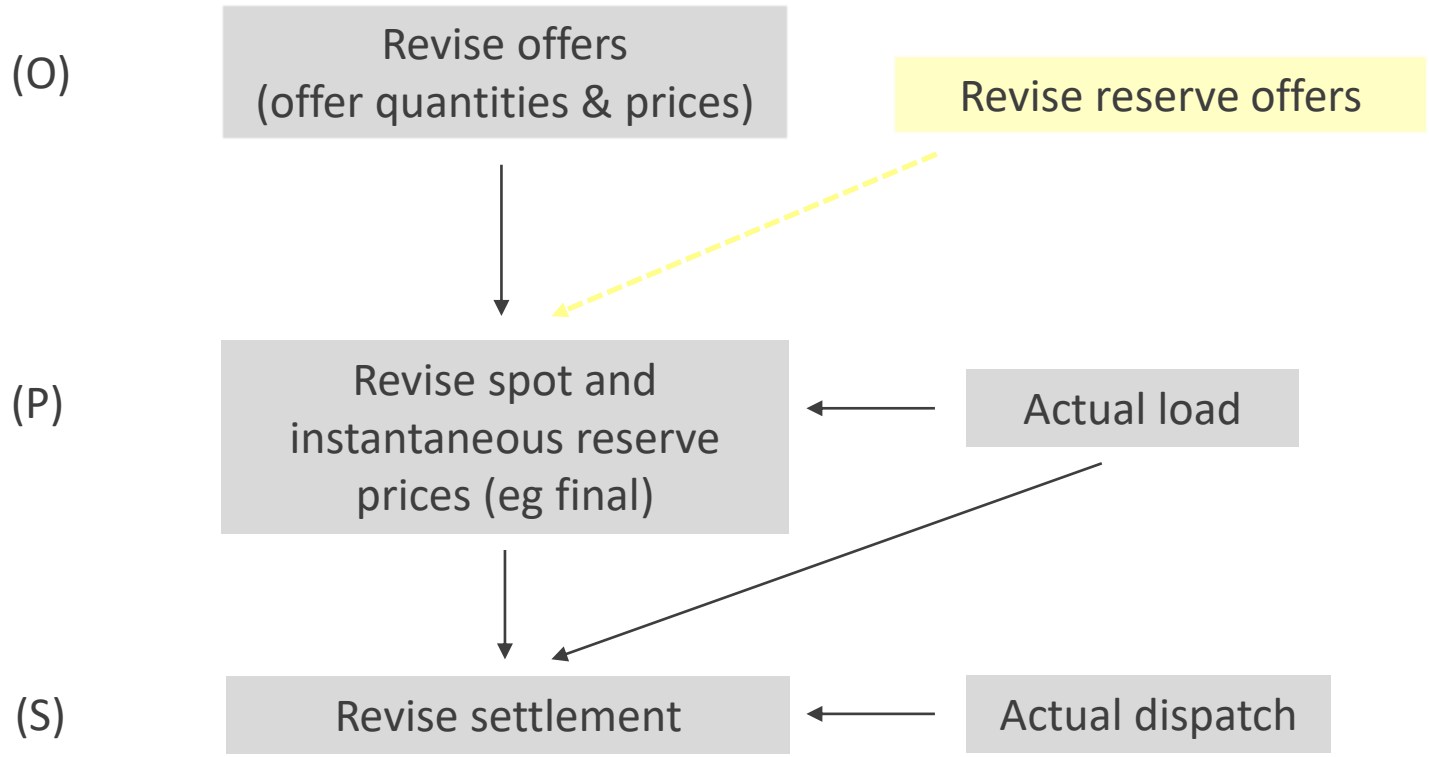
- UTS has been found to have occurred
- UTS outcomes –
  - Spill and price/settlement consequences
  - Outcomes inconsistent with supply and demand conditions in UTS period
- Consulting on actions-to-correct
- Little scope to un-spill spill
- Given above, proposed ATCs focus on price/settlement outcomes

Market scale(s)
2020 (annual)

Component	Settlement ($M)	Relative to Energy
Energy (spot)	$4,500 million	4,500 / 4,500 = 1.000
Loss and constraint excess	$140 million	140 / 4,500 = 0.031
Instantaneous reserves	$30 million	30 / 4,500 = 0.006̇
Frequency keeping	$15 million	15 / 4,500 = 0.003̇

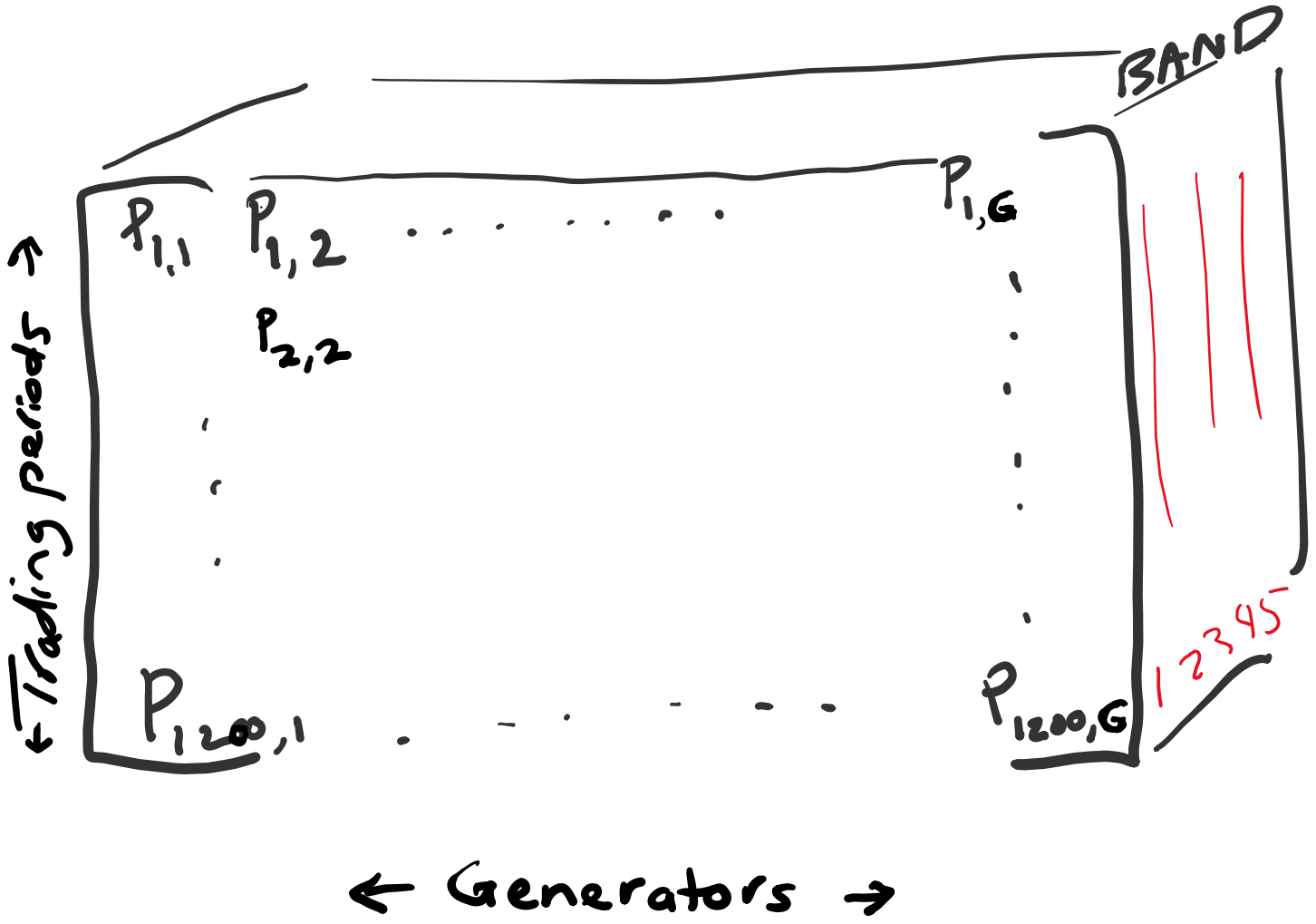
Proposal: Revise Settlement (S) via (O) and (P)

Generator g ,offer at trading period t, date d		
Band	Price	Quantity
1	p_1	q_1
2	p_2	q_2
3	P_3	q_3
4	p_4	q_4
5	p_5	q_5



Most general offer price revision

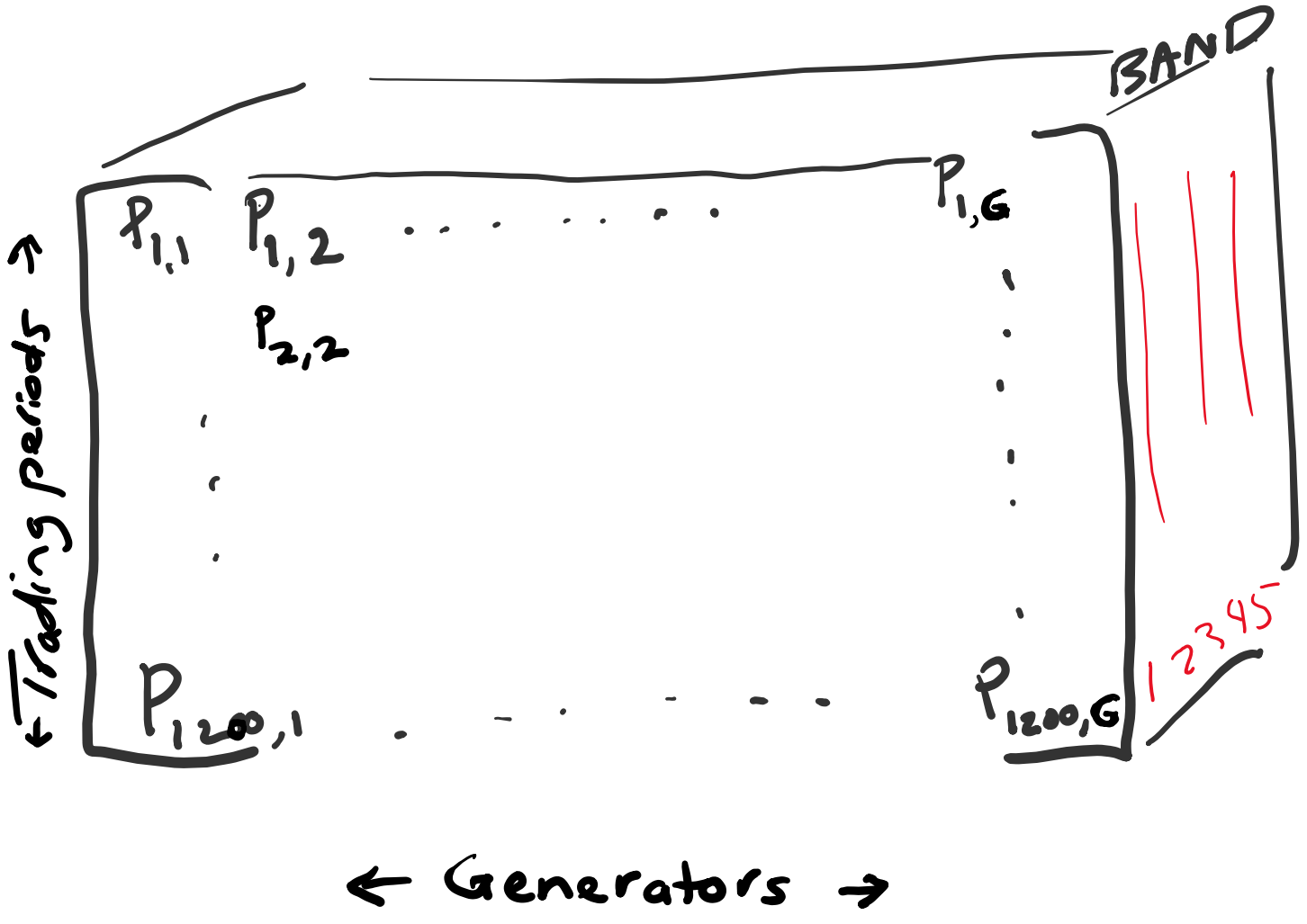
1200 Trading periods
× G generators
× 5 bands



A three dimensional array of offer prices.

There is also an array of offer quantities, which we do not propose to revise

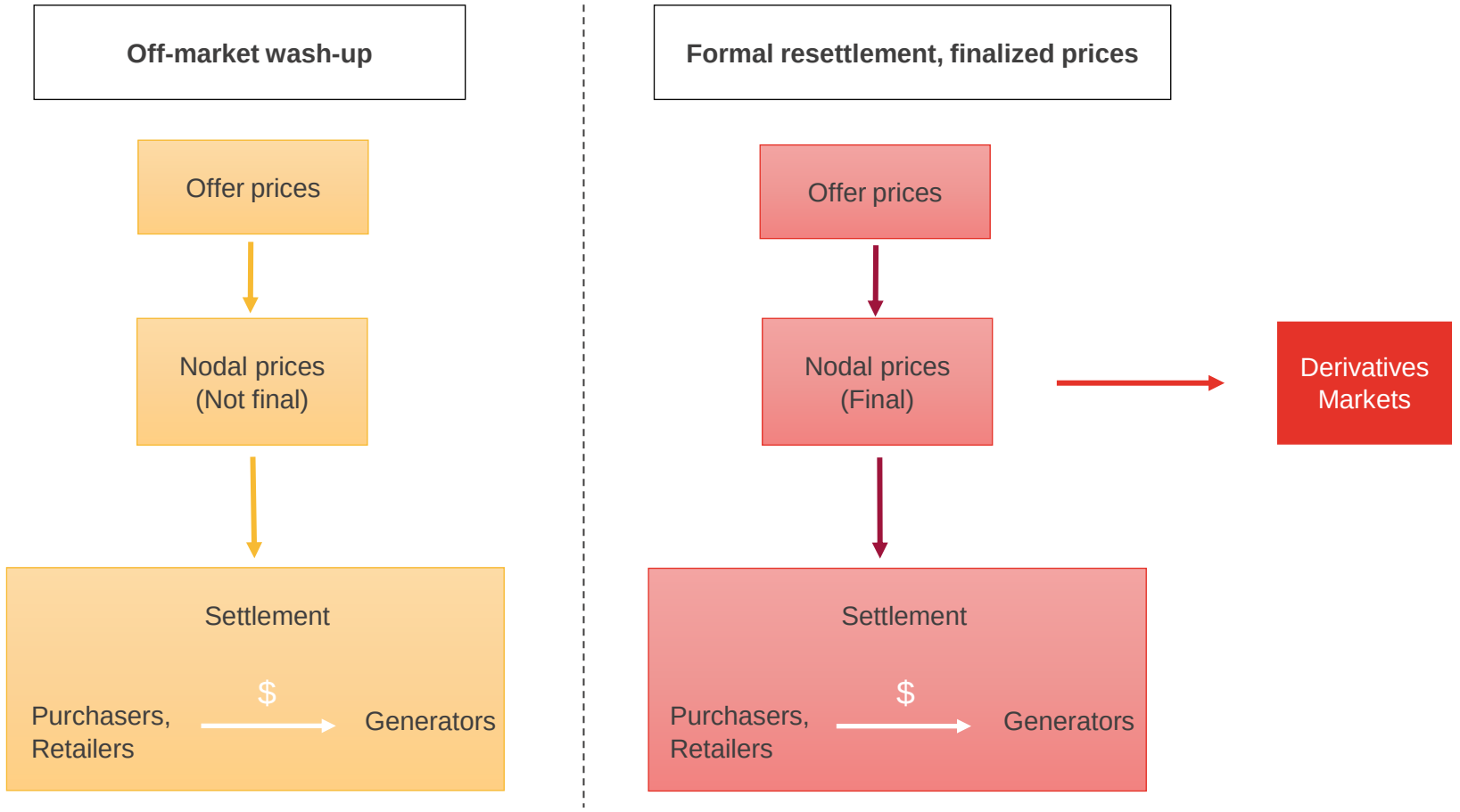
1200 Trading periods
x G generators
x 5 bands



HSOTC incentivises generators to offer all feasible capacity.

A three dimensional array of offer prices.

To finalise, or not to finalise – that is the question



ATC design – proposed elements

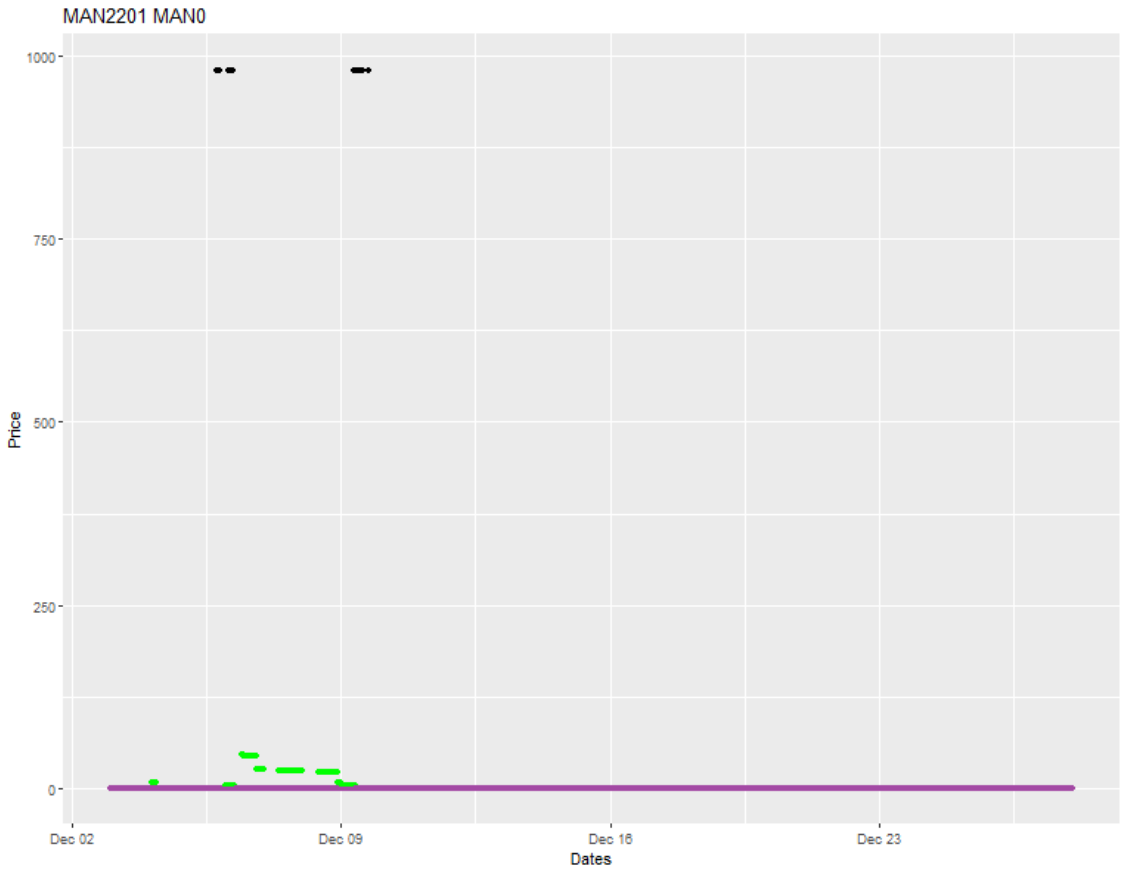
- Revise whose offers?
  - *Lower South Island hydro ex Manapōuri and Tekapo*
- What offer prices?
  - *Cap on offer prices, eg at $13.70/MWh*
- What offer quantities?
  - *Aggregate offer quantities retained*
- Constrained on payments for certain generating stations
- Ancillary markets
  - Instantaneous reserve offers & frequency keeping offers – *no proposed revision*
- Derivatives *markets*
  - *OTC & ASX Futures – Determined by T&Cs and ASX/ASIC decisions*
  - *FTRs – Determined by FTR allocation plan / T&Cs*
  - *HSAs – revised given way Code is written*

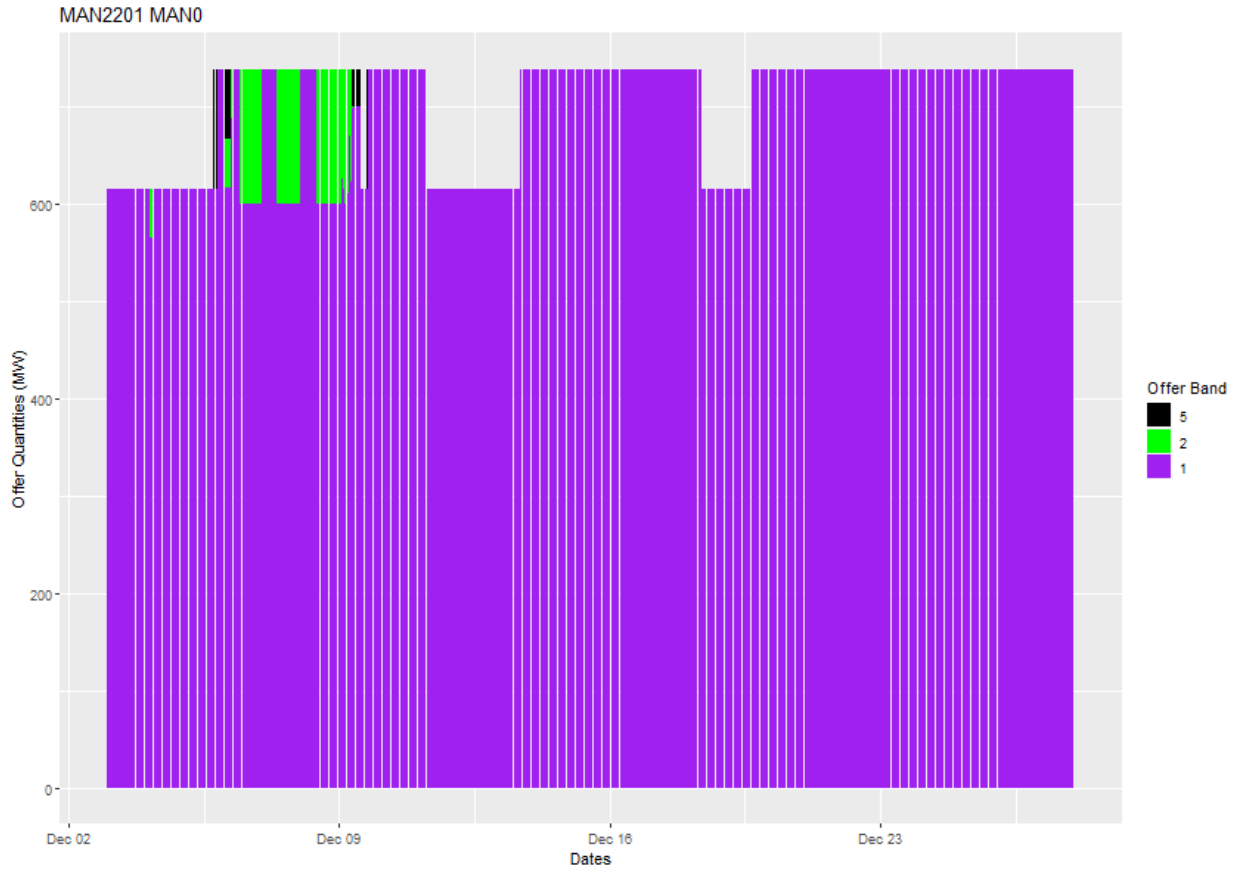
Which generation stations should be corrected?

ELECTRICITY AUTHORITY
TE MANA HIKO

Manapōuri UTS offers generally at low prices

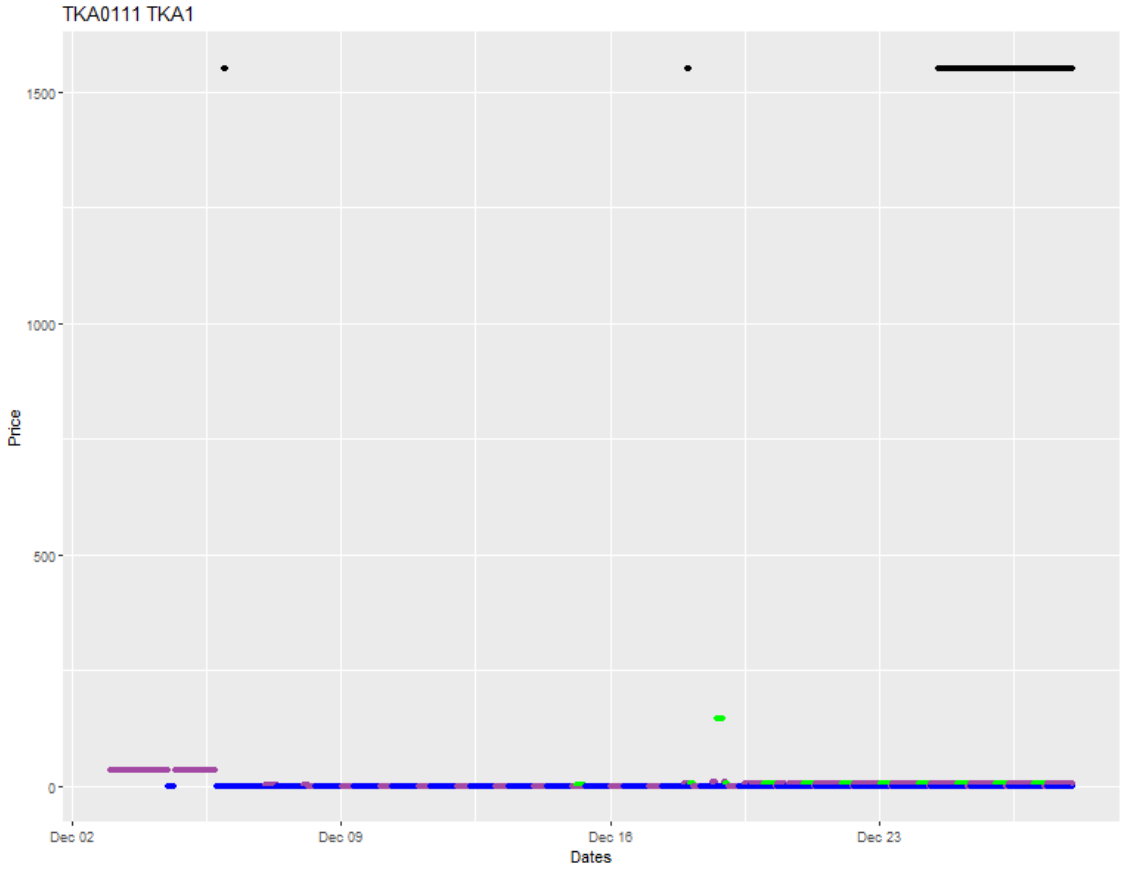
Note: Band colours differ to subsequent slides. Offer price and offer quantity colours are aligned.

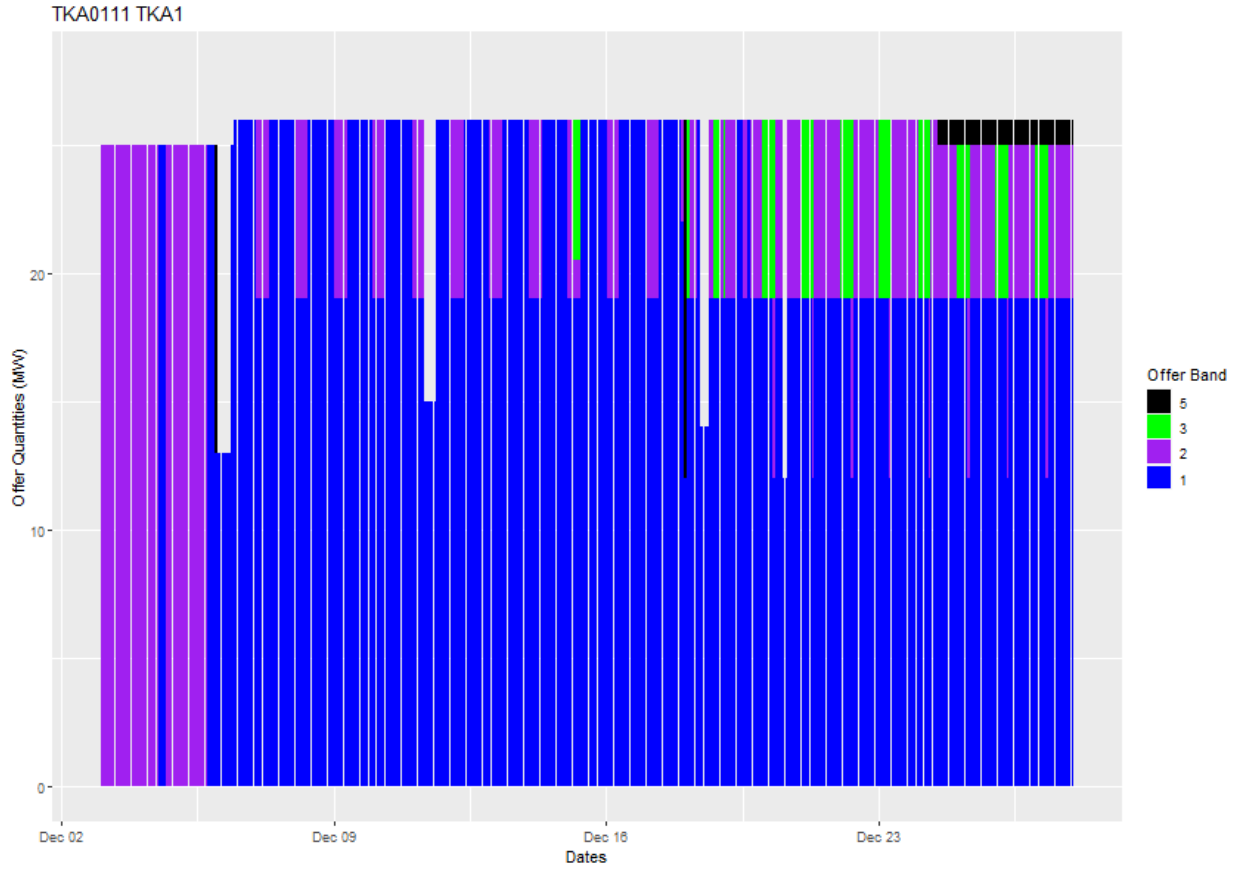




Tekapo A UTS offers generally at low prices

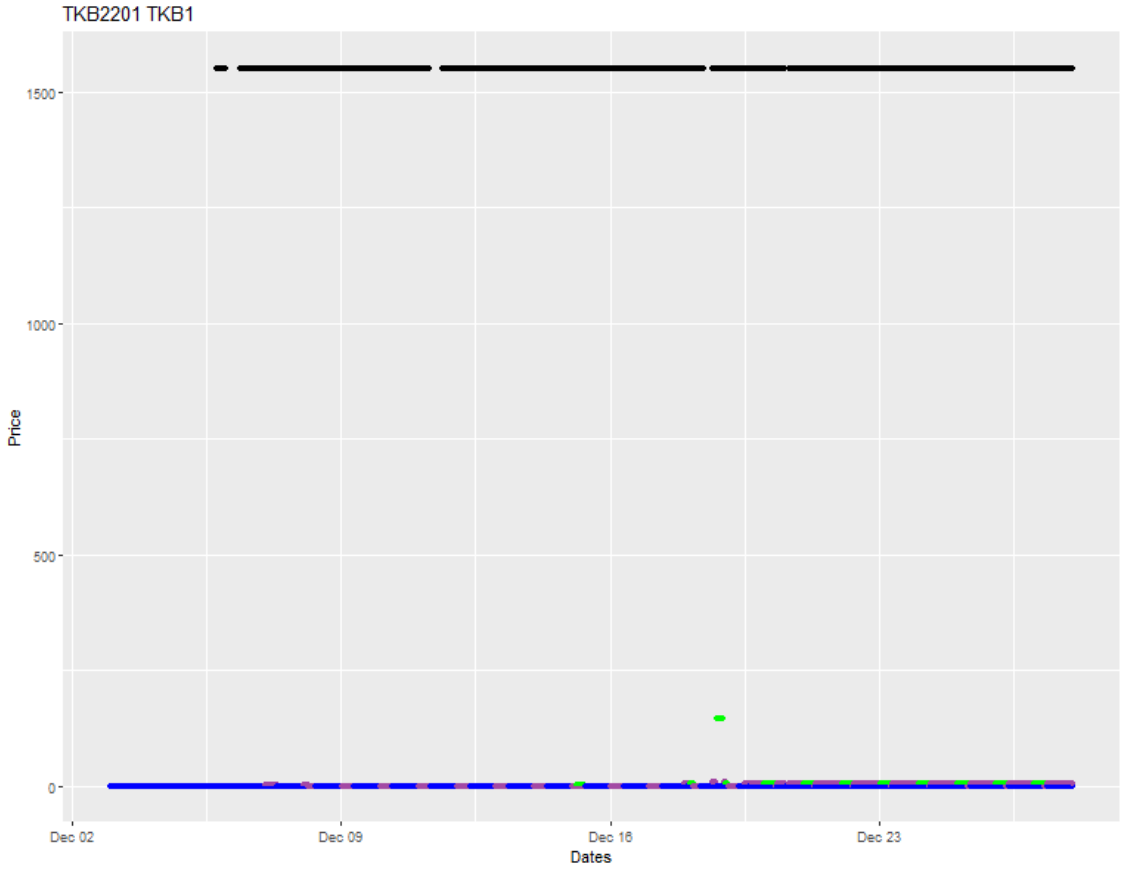
Note: Band colours differ to Manapōuri slide. Offer price and offer quantity colours are aligned.

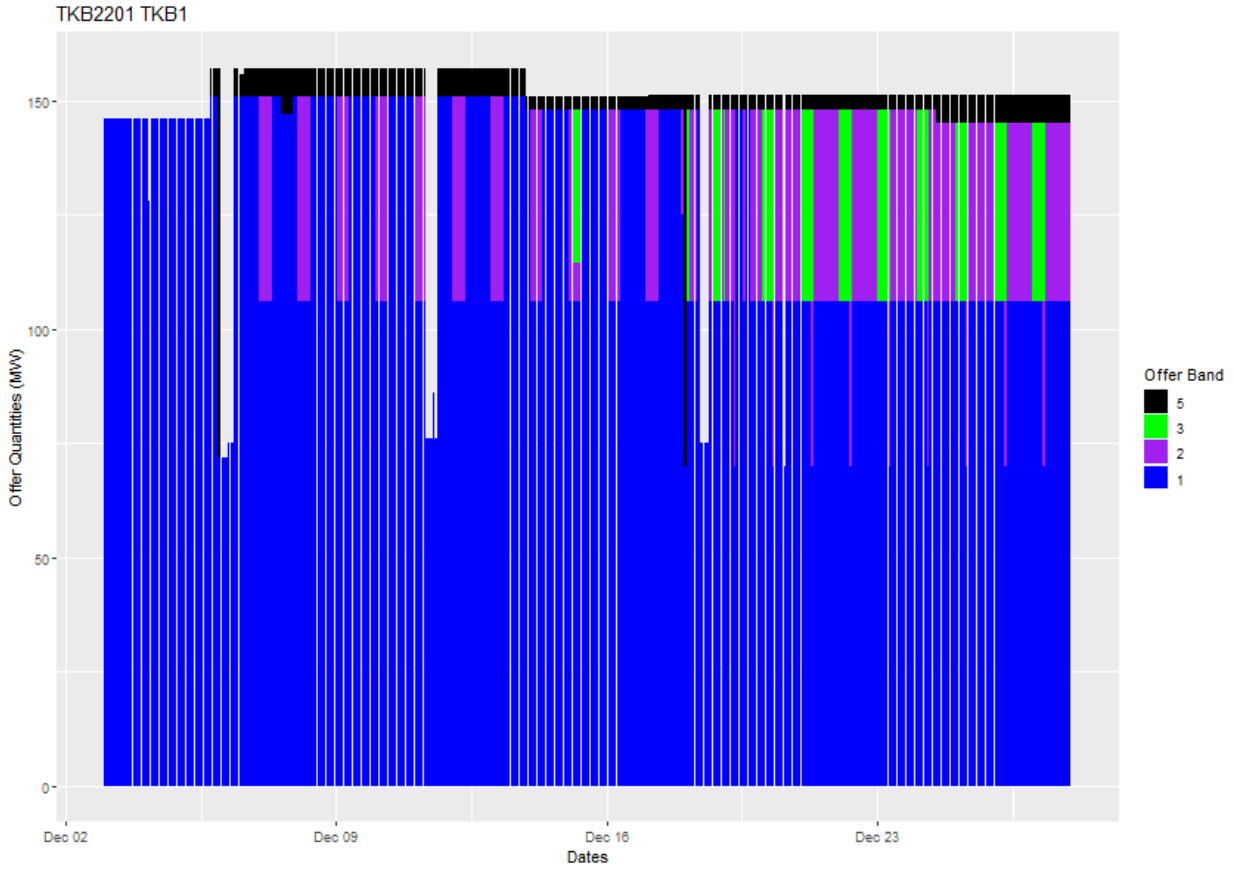




Tekapo B UTS offer generally at low prices

Note: Band colours differ to Manapōuri slide. Offer price and offer quantity colours are aligned.



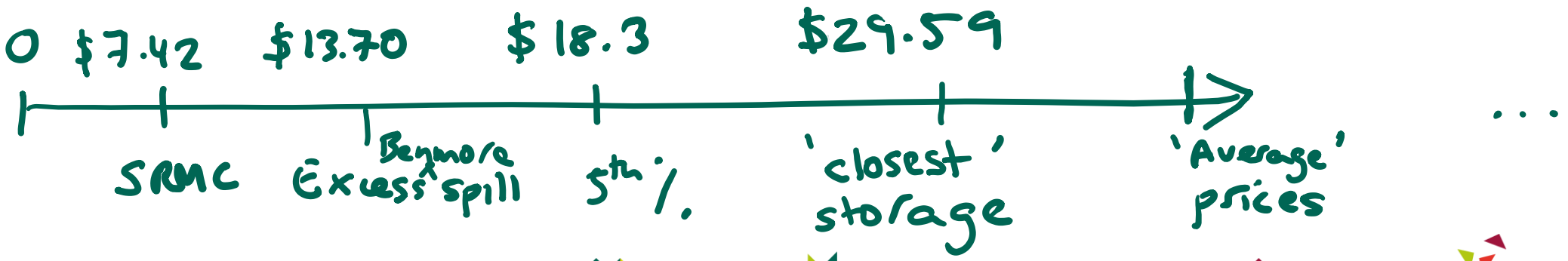


Not proposing to correct offers from North Island Generation

- Efforts to conserve water consistent with impending outages
- NI offer behaviour consistent with expectations
- Not raised as a issue in the original claim
- Simplifies correction

Alternative calibrations of the cap (low to high)

- $7.42/MWh: Approximate SRMC SIMI cost + $1 (Parsons Brinckerhoff 2011: variable $0.95/MWh; MBIE 2020 SI: $8/MWh)
- $13.70/MWh: Excess spill price (single fixed price required to dispatch excess Benmore generation)
- $18.30/MWh: 5th percentile of LSI daily average prices (Sample period: 1/1/2010-2/12/2019)
- $19.98/MWh: Symmetric to $7.42 around $13.70 (for sensitivity analysis)
- $29.59/MWh: 'Closest' hydrological conditions (top 1% of storage over last doz. years; only roughly approximates 2019 hydrological conditions)



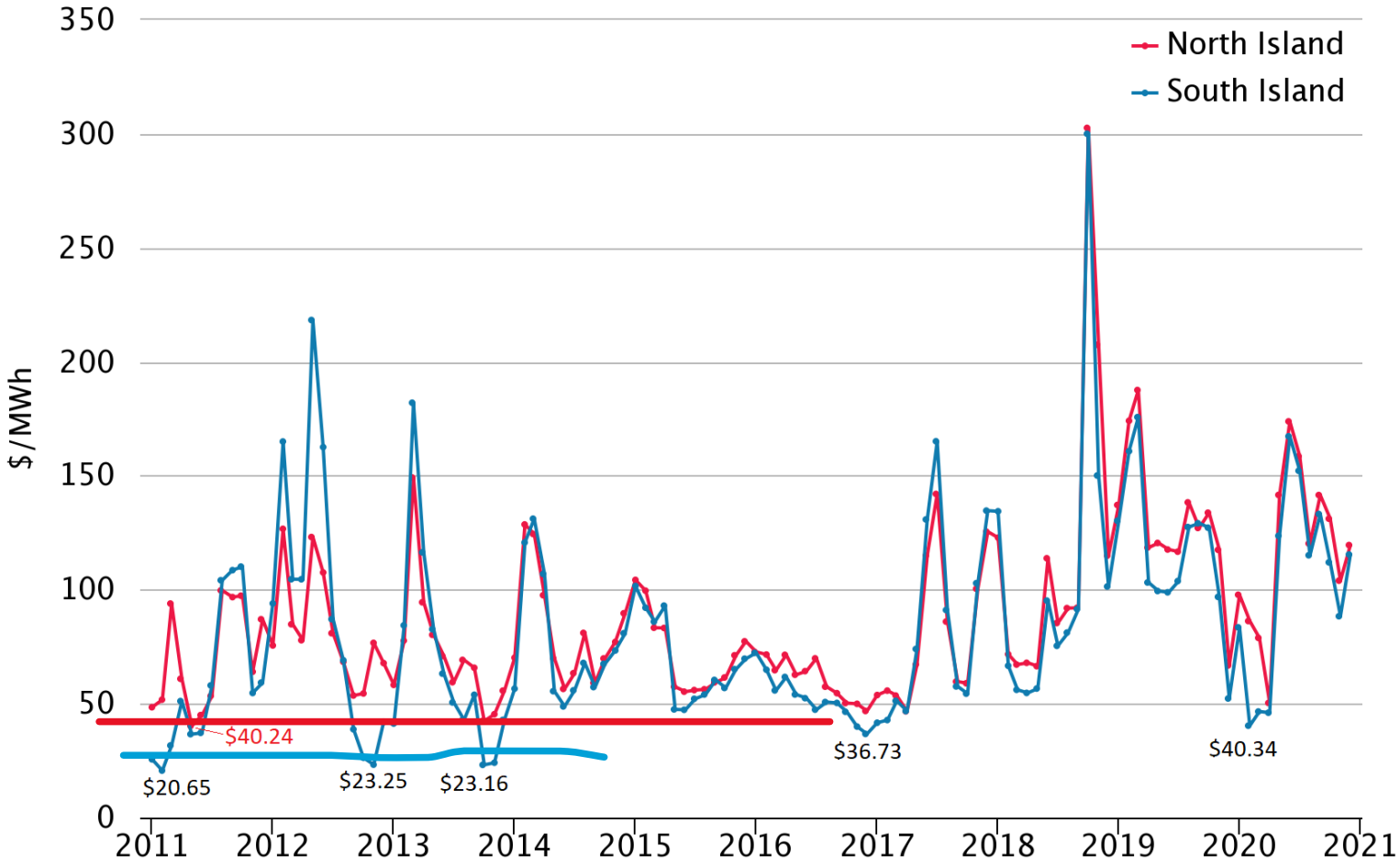
Aggregate market effects – Prices and $$$

ELECTRICITY AUTHORITY
TE MANA HIKO

Prices – Energy, FIR, SIR

	Offer Cap $7.42/MWh	Offer Cap $13.70/MWh	Offer Cap $19.98/MWh	Offer Cap $29.59/MWh	UTS Period
	($/MWh)	($/MWh)	($/MWh)	($/MWh)	($/MWh)
Average North Island Price*	37.89	40.84	43.66	47.45	70.27
Average South Island Price*	19.82	23.59	27.03	31.40	55.43
Average Reserves Price North Island (FIR)**	6.83	6.84	6.92	6.91	7.98
Average Reserves Price South Island (FIR)**	1.56	2.00	2.33	2.55	5.51
Average Reserves Price North Island (SIR)**	1.81	1.85	1.91	1.94	1.85
Average Reserves Price South Island (SIR)**	0.81	0.92	1.04	1.14	1.66

Average revised prices accord with prior historical minima



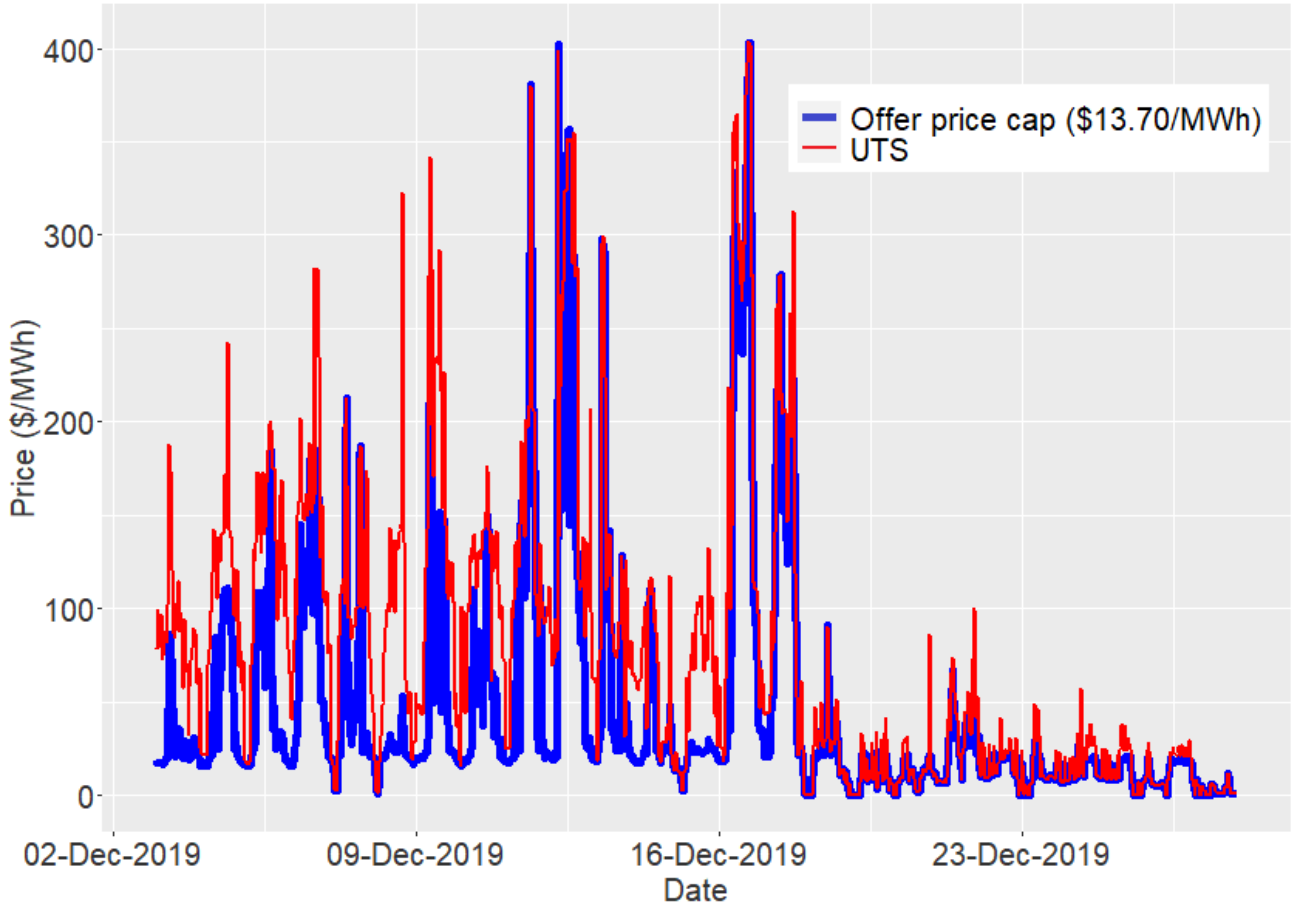
$13.70/MWh offer price cap →
SI average final price $23.59/MWh
NI average final price $40.84/MWh

emi.ea.govt.nz/r/nqhy2

ELECTRICITY AUTHORITY
TE MANA HIKO

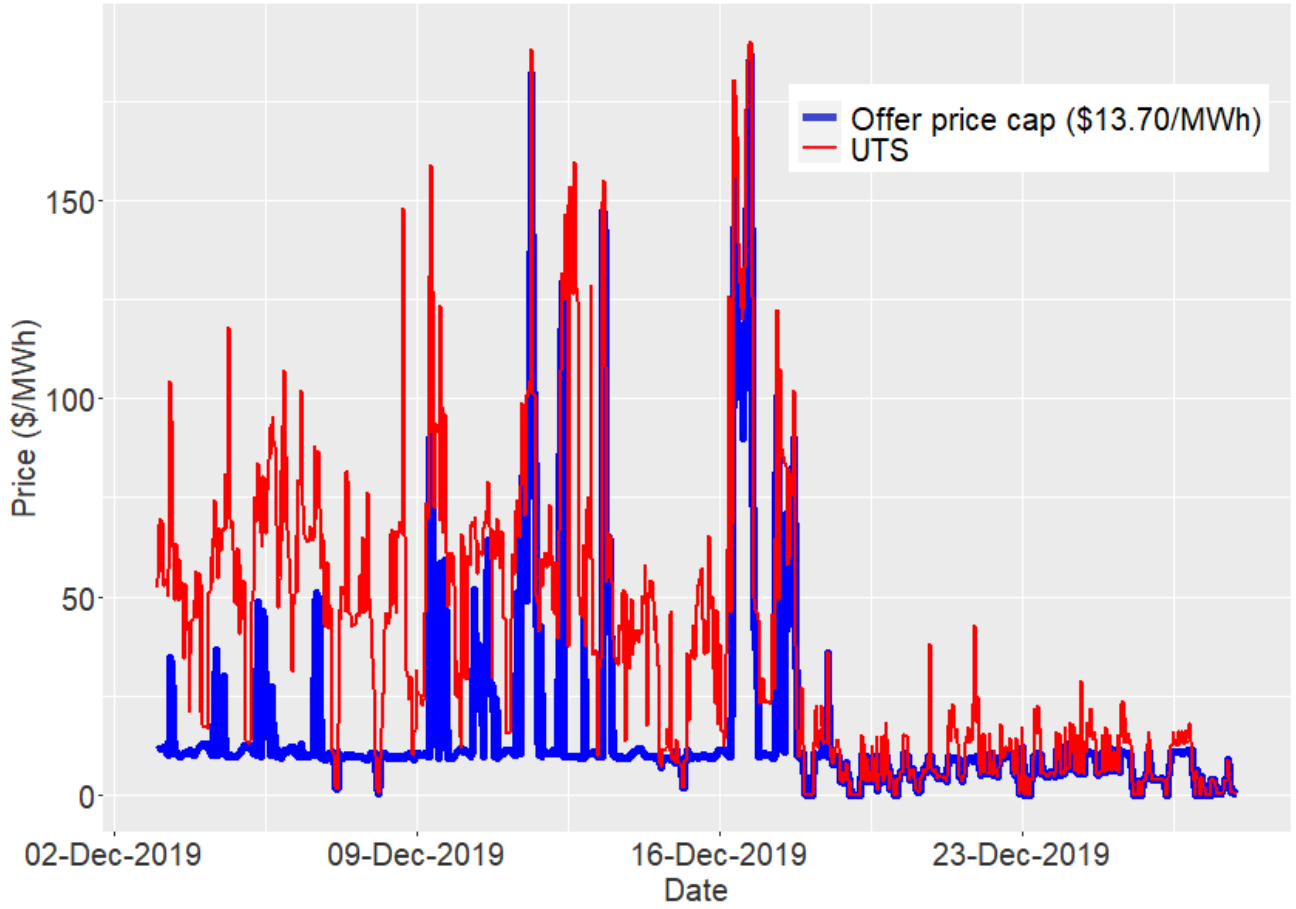
Average North Island prices for UTS period

Derived from $13.70/MWh offer price cap for Waitaki, Clutha generating stations



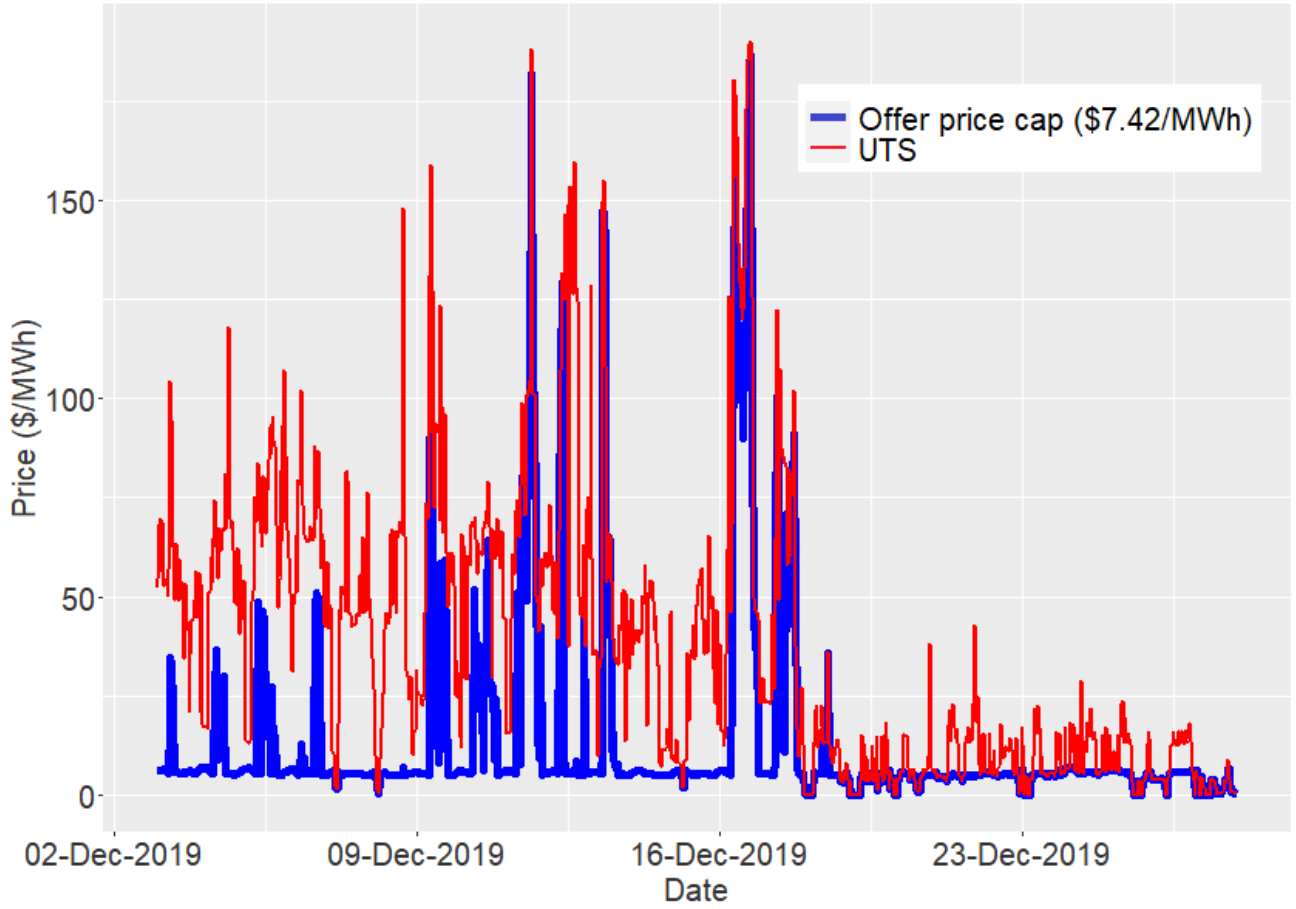
Average South Island prices for UTS period

Derived from $13.70/MWh offer price cap for Waitaki, Clutha generating stations



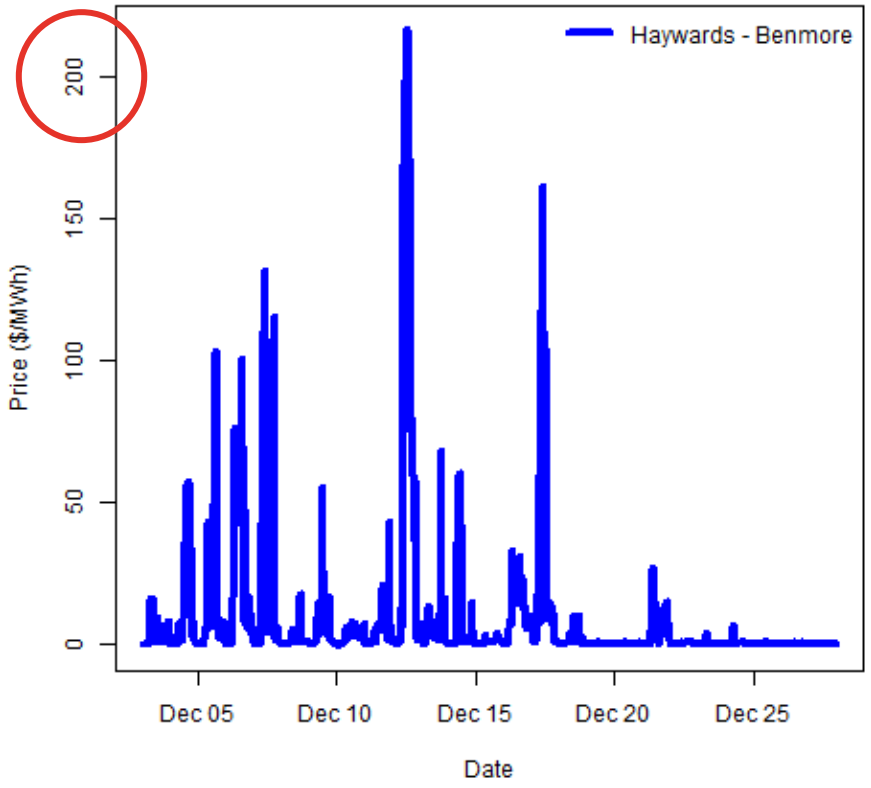
Average South Island prices for UTS period

Derived from $7.42/MWh offer price cap for Waitaki, Clutha generating stations

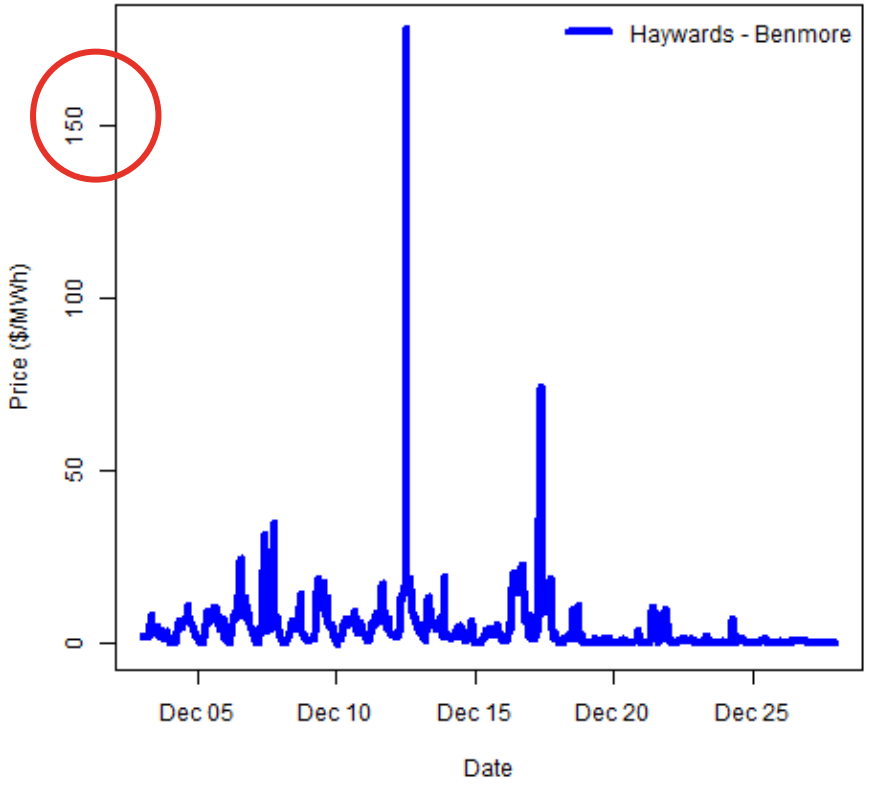


Benmore – Haywards price separation

$13.70/MWh Offer price cap price separation



Original UTS price separation



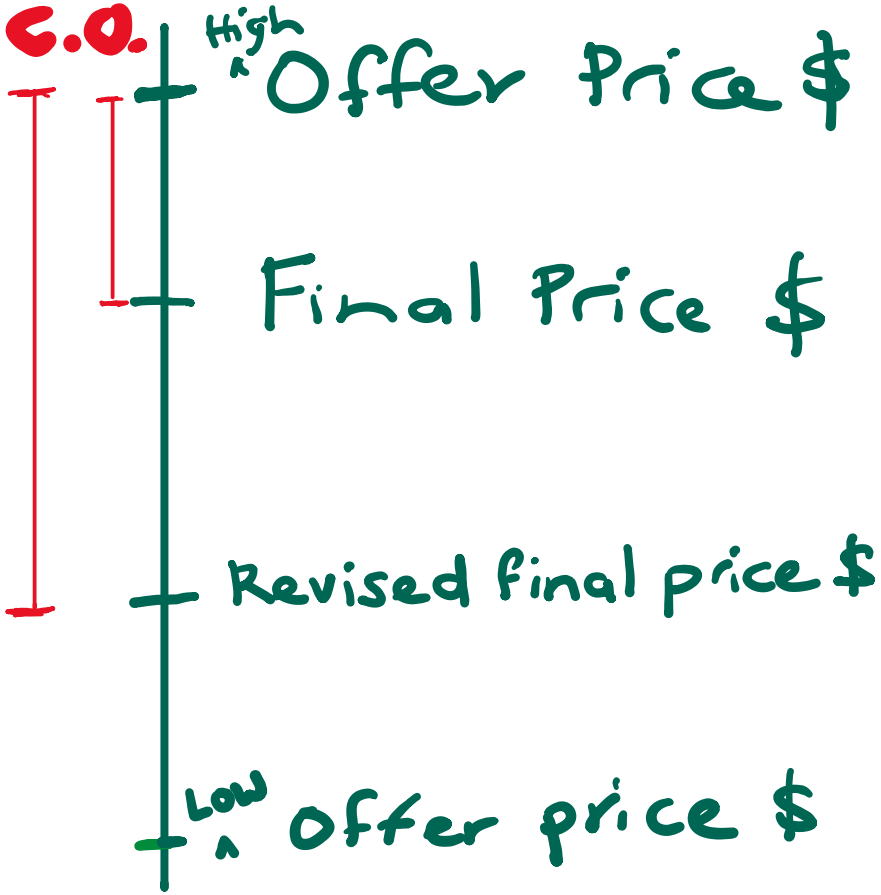
Cost of electricity under different corrections

	Offer Price Cap $7.42/MWh	Offer Price Cap $13.70/MWh	Offer Price Cap $19.98/MWh	Offer Price Cap $29.59/MWh	UTS Period
	($ m)	($ m)	($ m)	($ m)	($ m)
North Island Spot Electricity Costs	59.90	64.58	69.03	75.03	111.11
South Island Spot Electricity Costs	20.40	24.28	27.82	32.31	57.05
Reserves Costs	1.30	1.32	1.35	1.37	1.57
Constrained on payments	1.50	1.30	1.10	0.96	0.40
Total (Spot + reserves + constrained on)	83.10	91.48	99.3	109.67	170.13
Loss and constraint excess	8.46	8.06	7.86	7.76	7.46

$170 - 91.48 ≈ $80m

NB. The numbers in red have been (slightly) corrected relative to the results originally reported in table 4 of the consultation paper.

Constrained on payments

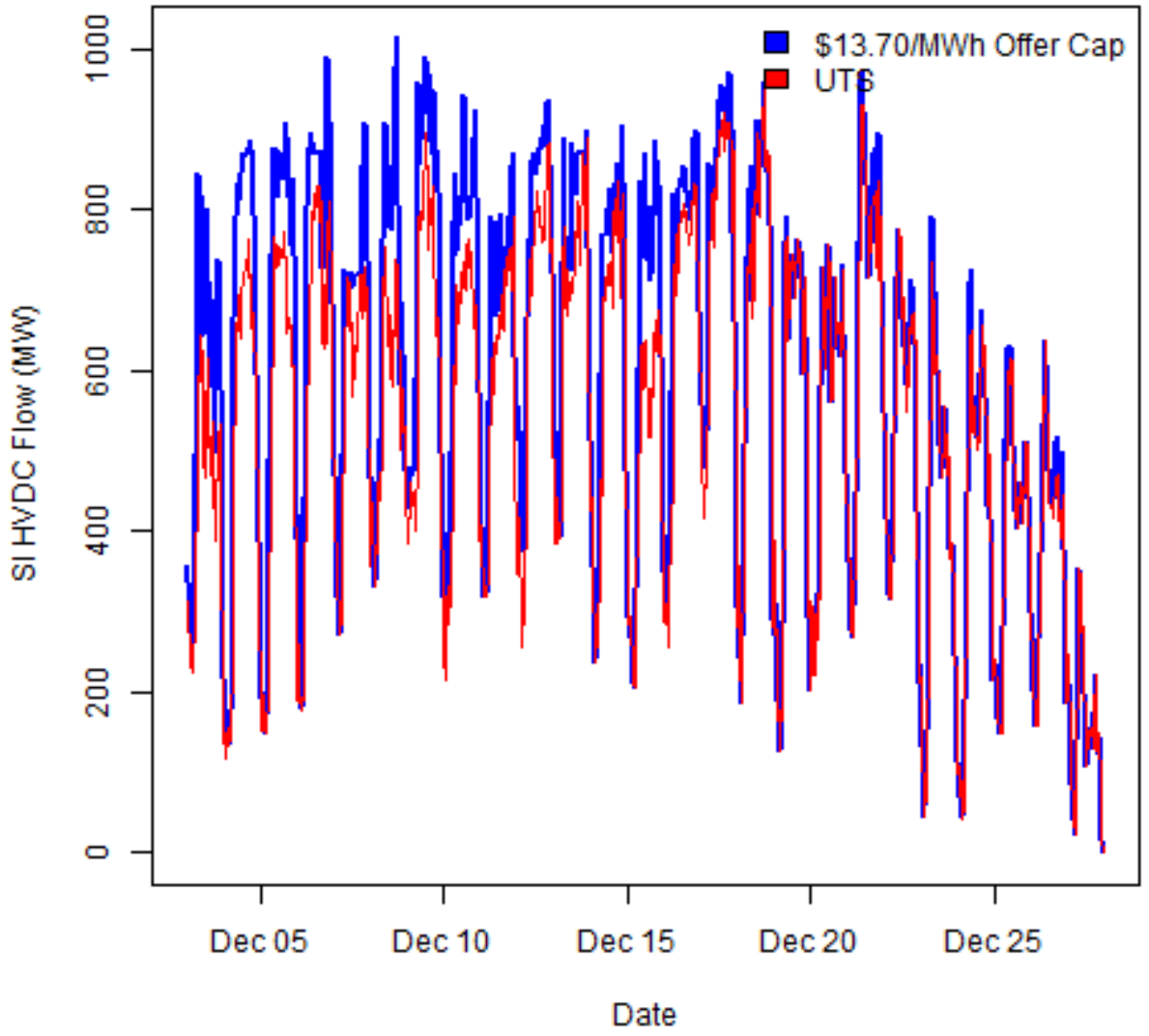


- Constrained on payments keep generators whole
  - For dispatched generation
  - Offer prices > final revised prices, and
  - Offers were not revised (ie not for SI generators w. revised prices)
- Generators receive revised final prices if offer prices < revised final prices
- Follows normal market processes
- Alternative – constrained on payment related to cost (not normal process; changes incentives to maintain security)

Flow over the HVDC

Proposed action to correct	North to South (MW)	South to North (MW)	Change in SI→NI HVDC flow (MW)
$7.42/MWh Offer price cap	0.08	607.15	69.50
$13.70/MWh Offer price cap	0.08	597.81	60.16
$19.98/MWh Offer price cap	0.08	584.99	47.24
$29.59/MWh Offer price cap	0.08	576.55	38.90
$13.70/MWh Single offer price	0.31	587.64	49.99
UTS	0.08	537.65	--

HVDC transfer South Island to North Island



Overall effects

Zero-sum game

- Generators refund over-payments that arose from the UTS
- Retailers and purchasers receive refunds for over-payments
- Hedges moderate the effects for individual participants
- NB: Repayments ≈ Reimbursements + change in LCE

Hypothetical impact of a UTS correction

Generator ID	Generation Arm (Repays money)	Retailing Arm (Receives money)	Net impact
A – Generator > retail	-20	+10	-10
B – Hedged Generator-retail	-10	+10	0
C – Independent Generator	-20	0	-20
D – Independent Retailer/purchaser	0	+25	+25
Change in LCE	--	+5	+5
COLUMN TOTALS	-50	+50	0

+ Other hedge flows

Ancillary and hedge markets

ELECTRICITY AUTHORITY
TE MANA HIKO

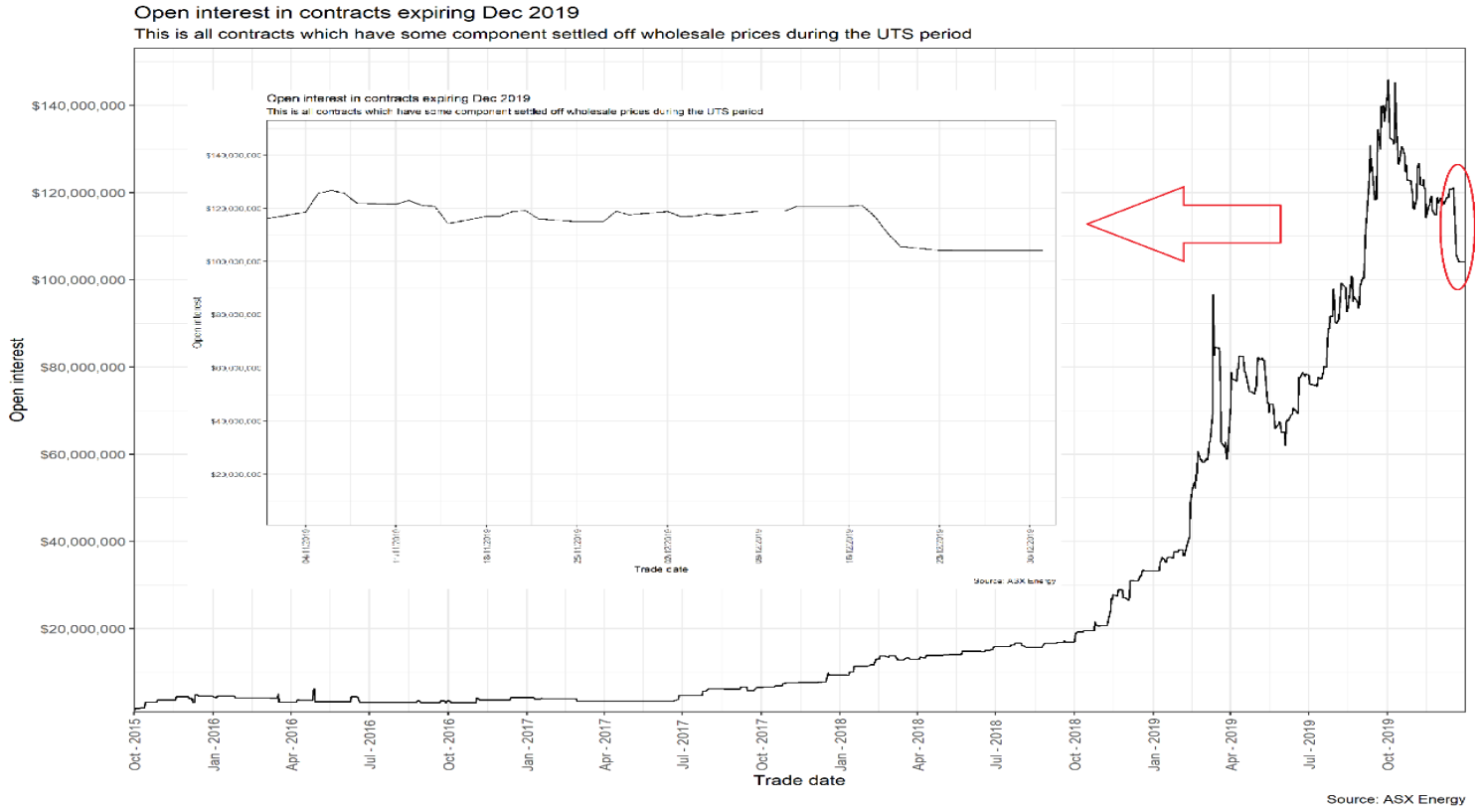
Ancillary markets

Trader ID	Pricing Node	Maximum offer price ($/MWh)	Value-weighted offer price ($/MWh)
CTCT	ROX2201 ROX0	180.00	127.47
	ROX1101 ROX0	150.00	119.39
	CYD2201 CYD0	120.00	13.28
	CYD0331	0.11	0.11
GENE	TKB2201 TKB1	1.00	0.01
	TKA0111 TKA1	1.00	0.59
MERI	BEN2202 BEN0	1.00	0.21
	OHA2201 OHA0	1.00	0.25
	OHB2201 OHB0	1.00	0.27
	AVI2201 AVI0	1.00	0.07
	OHC2201 OHC0	1.00	0.27
	WTK0111 WTK0	0.02	0.02
	MAN2201 MAN0	0.00	0.00

- Instantaneous reserves (IR) and energy prices co-optimised
- Proposing to have IR prices revised, reflecting revisions to energy offers
- Not proposing to revise IR offers but seeking feedback – could perhaps revise Contact's Clyde/Roxburgh offers
- North Island reserve offers more important to support northward flows over the HVDC
- Eligibility for constrained on IR treated symmetrically to energy market

Assets are traded through time – not proposing to correct all history

Open interest – an illustrative example



(Open interest for ASX derivatives maturing Dec-2019.)

FTR average price differences for OPT

FTR node combos (SOURCESINK)	Offer Price Cap $$7.42/MWh ($/MWh)	Offer Price Cap $13.70/MWh ($/MWh)	UTS Period ($/MWh)
Options (Average of all positive price differences)			
BENHAY	9.95	9.06	4.26
BENOTA	15.57	15.09	14.02
BENISL	1.51	1.76	4.09
All positive inter-island	12.16	11.45	8.14
All positive SI only	1.8	2.06	4.72
All positive NI only	2.94	3.14	4.89

FTRs and related outcomes

- Authority expects FTR market to be revenue sufficient
- Residual LCE to Transpower
- Direct over- and under-payments on residual LCE to be corrected

Futures/options resettlement would affect participants outside of NZ

Node	Change in settlement ($)	Change in settlement ($)	Change in settlement ($)
	Single Offer Price $13.70MWh	Offer Cap $13.70/MWh	Offer Cap $7.42/MWh
BEN	5.56 m	6.05 m	6.82 m
OTA	7.67 m	8.36 m	9.20 m

Conclusion I

- UTS found – namely a threat to confidence in the wholesale market
- Proposed action to correct the UTS focuses on correcting settlement, calibrated by changing offers of South Island hydro generators
- Correction provides an approximate resolution of the UTS – cannot restore all usual market processes and un-wind all consequences.
- Seeking public feedback on the proposal, and welcome your feedback.

Conclusion II

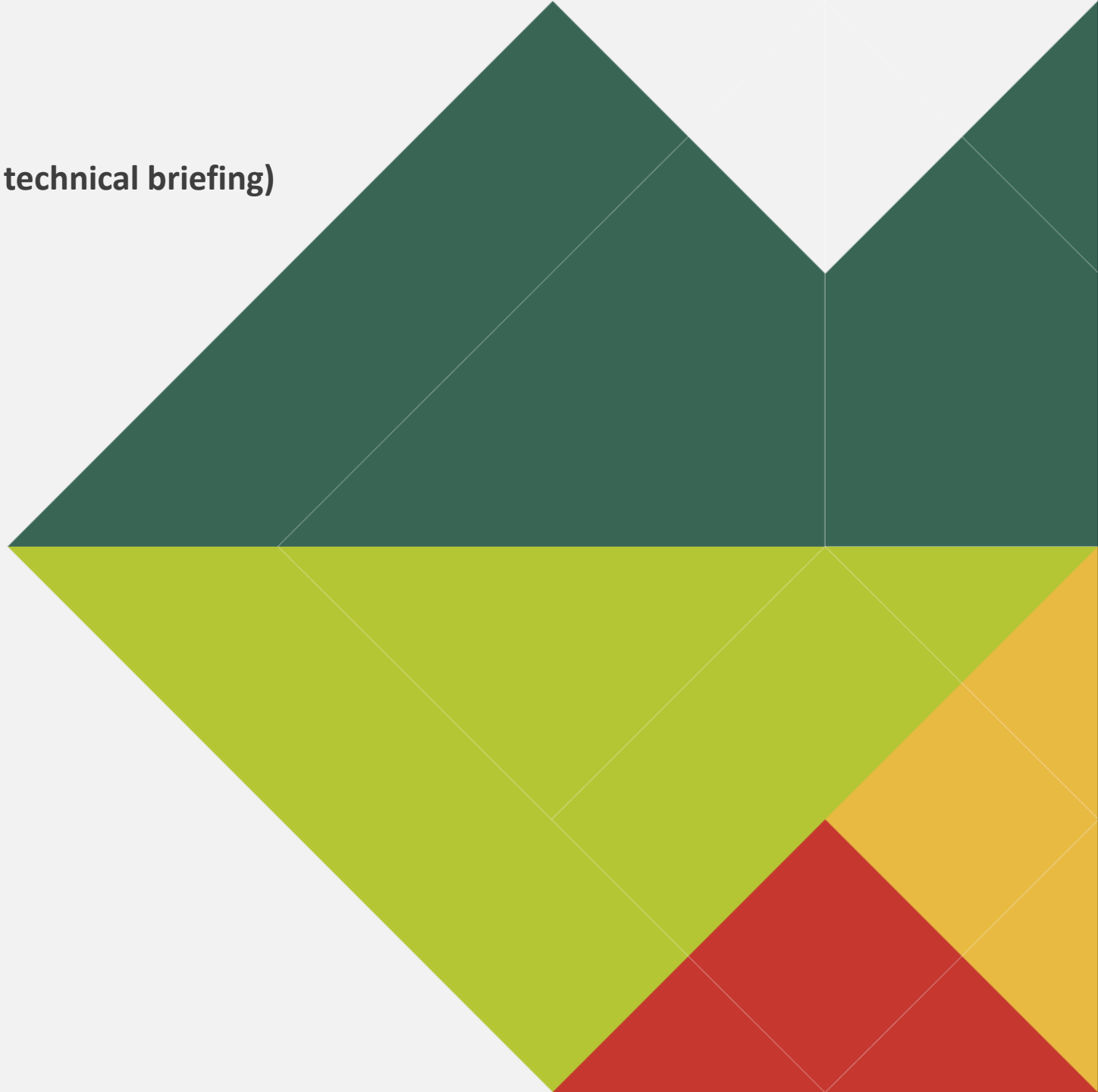
Next steps / up-coming

- Consultation concludes 5pm 27 April 2021
- Cross-submission period 28 April – 19 May 2021
- Final decision paper – produced by Authority staff and approved by Board
- Operational implementation of any ATCs from the final decision paper

Questions?

Additional slides

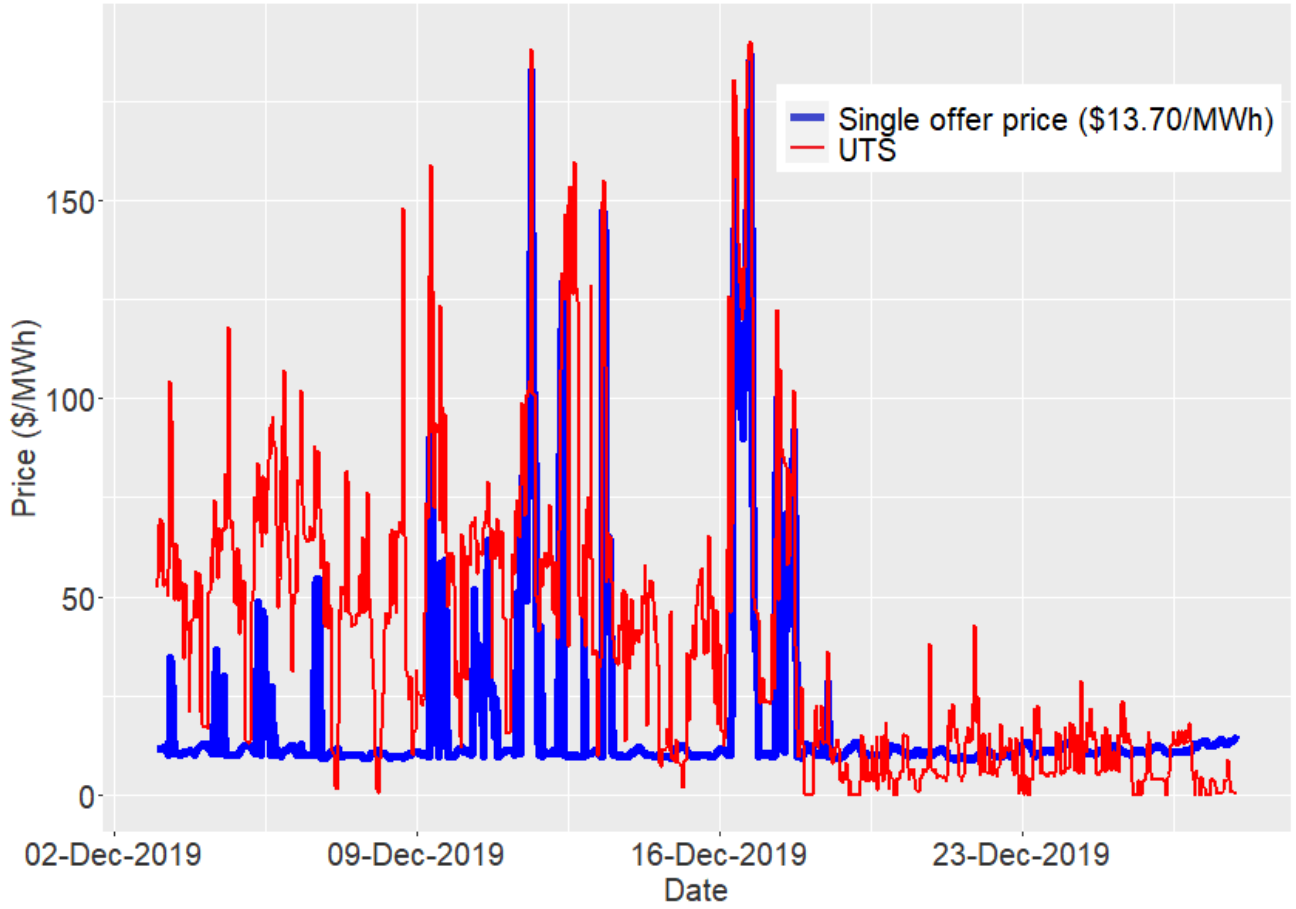
(Note - these are FYI and were not shown at the technical briefing)



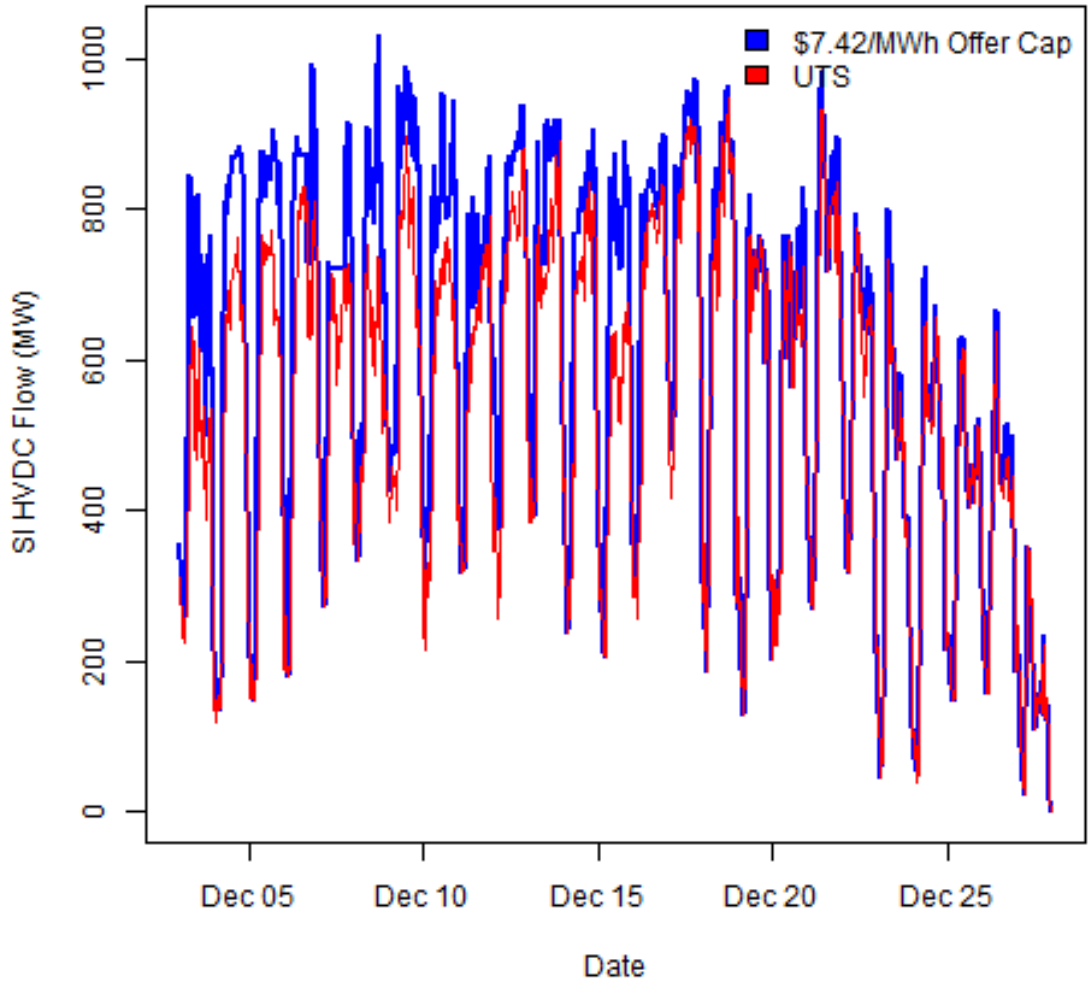
ELECTRICITY AUTHORITY
TE MANA HIKO

Average South Island prices for UTS period

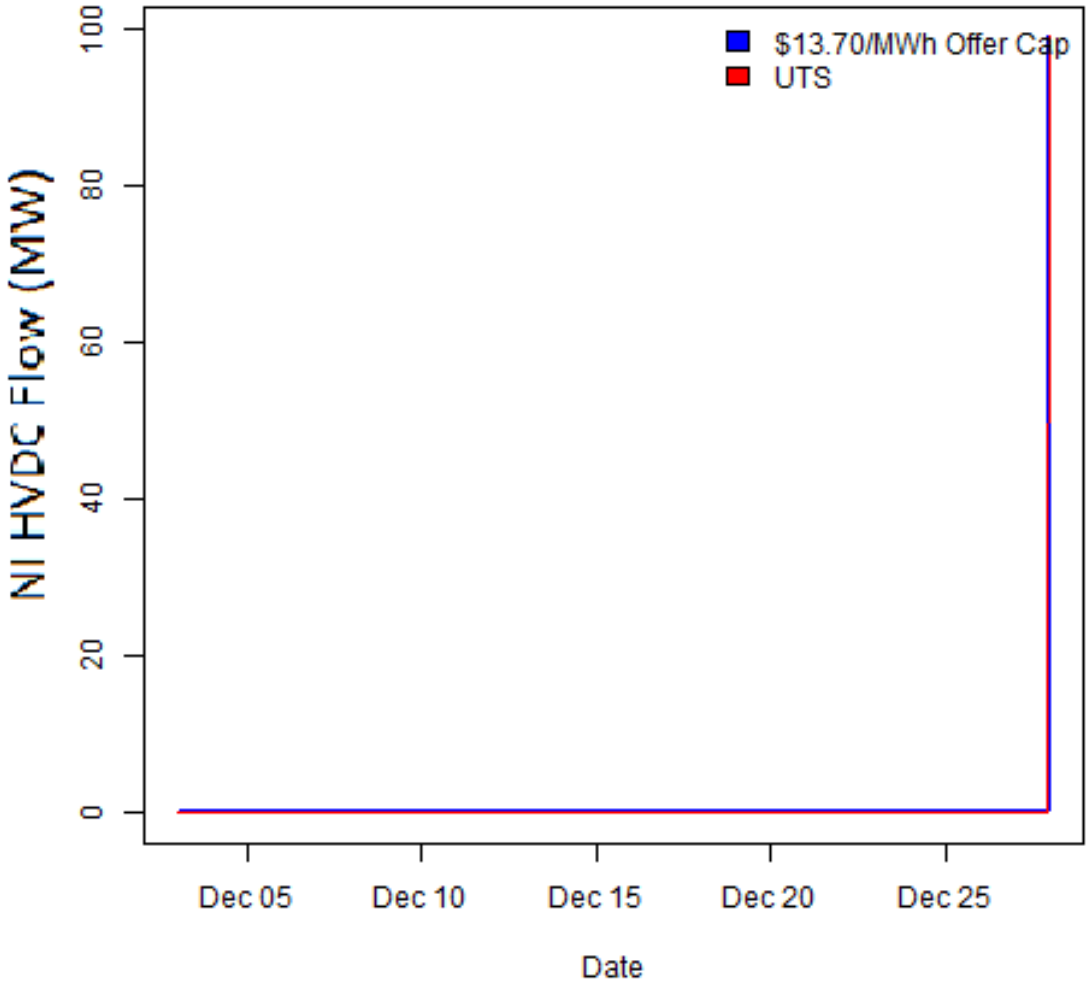
Derived from $13.70/MWh single flat offer price for Waitaki, Clutha generating stations



HVDC transfer South Island to North Island



HVDC transfer North Island to South Island



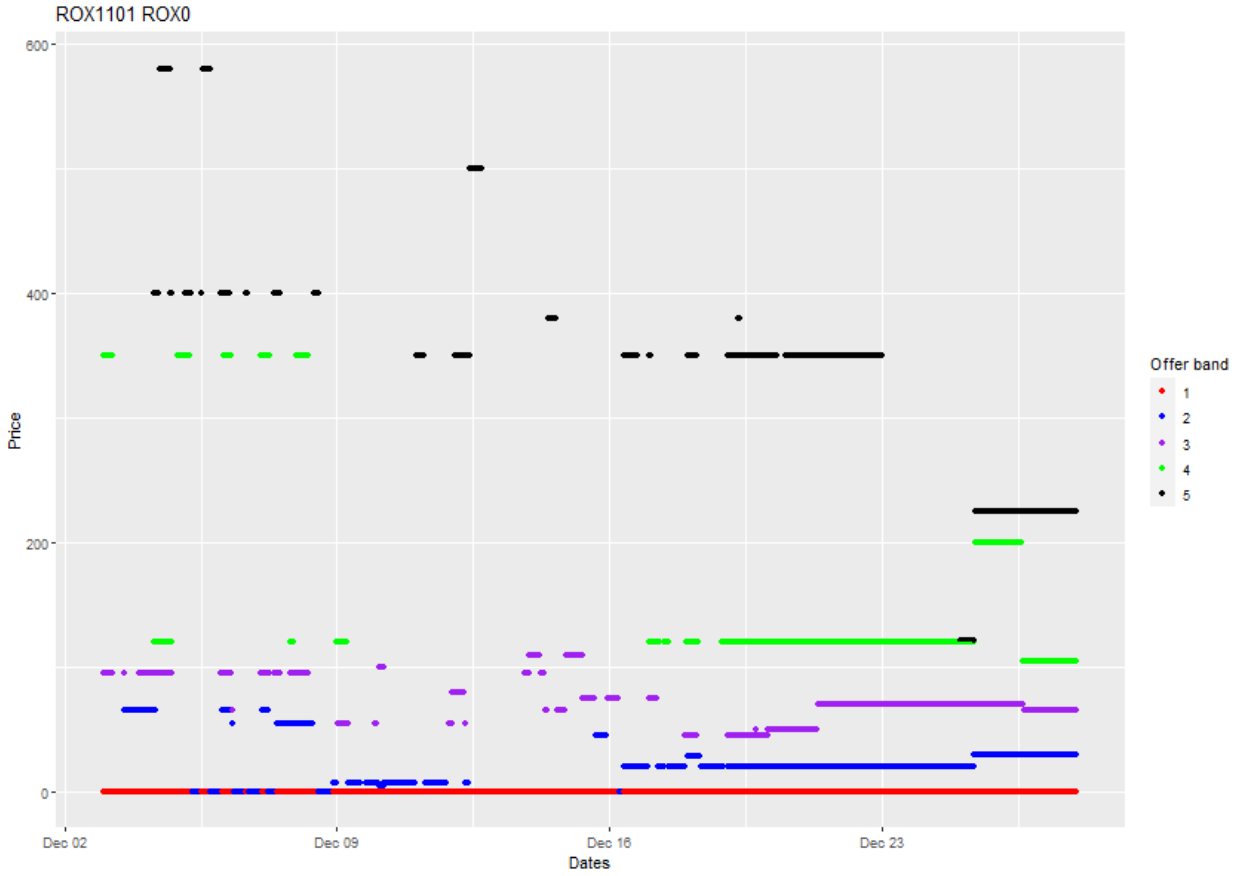
FTR average price differences for OBL

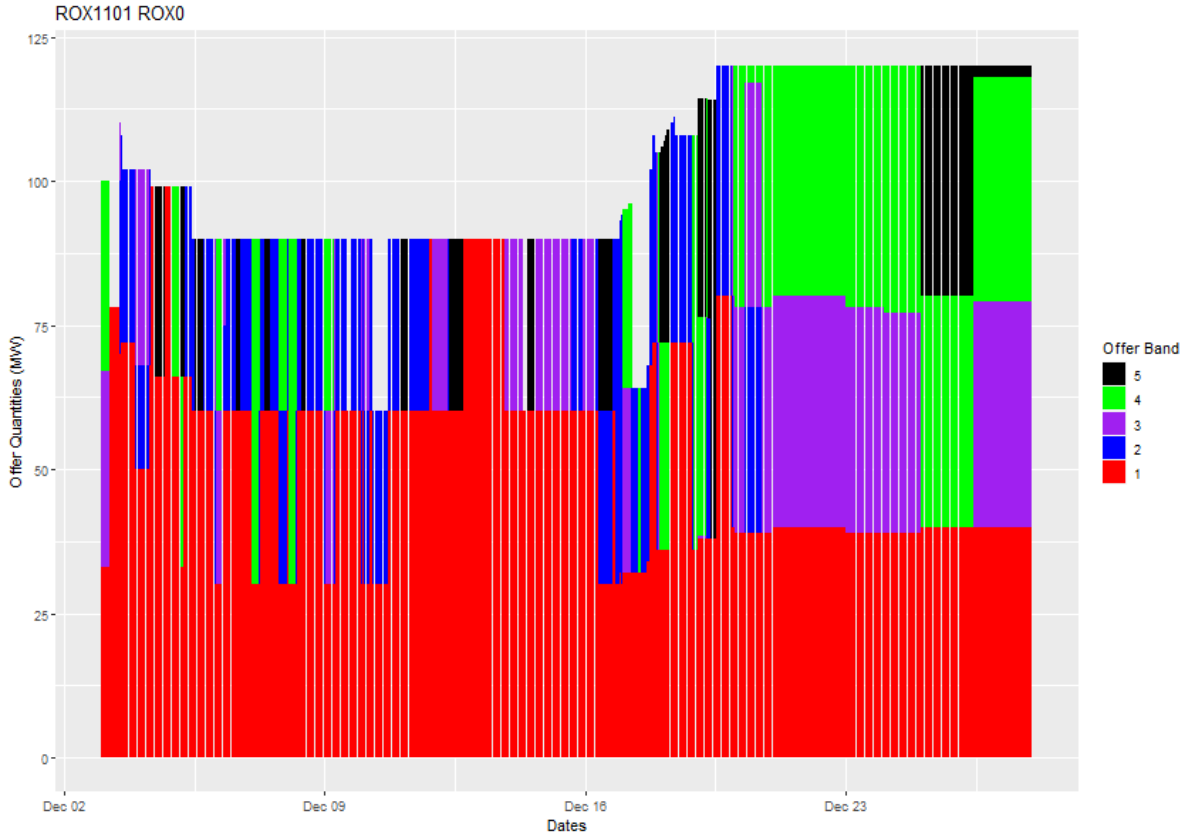
FTR node combos (SOURCESINK)	Offer Price Cap $$7.42/MWh ($/MWh)	Offer Price Cap $13.70/MWh ($/MWh)	UTS Period ($/MWh)
Obligations (Average of all price differences)			
BENHAY	9.81	8.93	4.09
BENOTA	15.57	15.09	13.69
BENISL	1.51	1.76	3.95
All positive inter-island	11.62	10.98	8.03
All positive SI only	1.8	2.06	4.72
All positive NI only	2.94	3.14	4.89
Options (Average of all positive price differences)			
BENHAY	9.95	9.06	4.26
BENOTA	15.57	15.09	14.02
BENISL	1.51	1.76	4.09
All positive inter-island	12.16	11.45	8.14
All positive SI only	1.8	2.06	4.72
All positive NI only	2.94	3.14	4.89

OBL = Obligation FTRs.

Roxburgh A offers during the UTS period

NB The colour schemes differ from earlier slides for Manapōuri and Tekapo.





Roxburgh B offers during the UTS period

NB The colour schemes differ from earlier slides for Manapōuri and Tekapo.