2. Transfer price settings FY22

2.1 Transfer Price

Background

Transfer pricing refers to the prices set for hedges between the Generation and Retail divisions (with Energy Trading acting as intermediary). Before about 2015, transfer prices were set largely as part of a budget process for the coming FY and were based on prices paid for major wholesale energy purchases by Energy Trading over the preceding years. More recently, transfer prices have been set with reference primarily to the ASX futures market, as this now represents an industry consensus amongst market makers and other participants, so providing a more robust view of forward prices over the coming 3 – 4 years. Major wholesale energy purchases are nevertheless monitored and considered as part of the transfer pricing process[1].

Base Price Recommendation

Figure 1 overleaf shows the pricing input structure, updated for the coming Financial Year.

A wholesale transfer base price of $91.31/MWh (annual baseload equivalent at Haywards) is recommended. This is a significant increase (+$5.81, or 6.8%) over FY21, reflecting some further lifts on the ASX curve over the last 12 months[2]. This lift continues the trend of recent years, on top of a transfer price increase of +$7.00 for FY21 over FY20, after a long period of flat and stable transfer prices between FY14 and FY19. This transfer price, with adjustments for profile shape and nodal differences, is used as the basis for the more granular transfer pricing for specific hedges between the Generation and Energy Trading divisions.

The primary factor in deriving this price is the ASX average for the new Financial Year, as it stood at the three previous "deemed renewal points" in Novembers of 2018, 2019 and 2020. These renewal points are chosen to reflect the fact that, in an arm's-length arrangement for resetting transfer prices, a "rolling third" process would typically apply, whereby prices are struck between the parties at a certain time each year, for one-third of the volume, for three year rolling periods. Such an arrangement would avoid the risk to both parties of a "cliff-edge" type expiry producing a price shock. November is usually chosen because it is sufficiently in advance of the new financial year to avoid most of the short-term hydrological volatility and to reflect the likely contracting window of two independent parties.

Applying estimated location factors from HAY then indicates a transfer price at our standard reference nodes of $95.42 at Huntly (Upper North) and $86.80 at Benmore (South Island). The Huntly price is an increase of $6.42 from the current FY21, and Benmore price is an increase of $3.30, both of which are justified given the ASX outlook and likely power flow balances.

In transferring hedges to Retail Mass Market (MM), we propose to retain an Energy Trading fee of $2/MWh which covers the risk management services provided in the repackaging of the generation hedges and spot volumes into fixed volume hedges at different nodes for Retail. This volume-based fee is supplemented by a fixed fee to the Energy Trading division (set at $200K per month for Retail and $100K for Generation, the same as the current FY), to reflect the standing costs and risks of Energy Trading. This approach has been used consistently over recent years, and provides the appropriate balance of commercial incentives to the Energy Trading, Retail and Generation divisions.

Derived monthly shape and location factors will be applied to these reference node prices in order to calculate actual hedge prices at the relevant nationwide nodes for both generation and retail hedges.

[1] excluding the Tilt windfarm PPAs, these deals comprise approx. 919 GWh for FY22 (around 36% of forecast exposed load). Refer Transfer Price Evaluation 2021-22 ($91.31 HAY +$2 MM) v0.2.xlsm

[2] For example, FY22 futures at OTA on the ASX have increased from around $97 in Nov 2019 to around $114 in Nov 2020. The main reasons appear to be ongoing gas price/supply risk (exemplified by diminishing Pohokura gasfield output), the restoration of Tiwai demand and a possible resumption of other demand growth ahead of new generation build.

TRANSFER PRICING FOR FY 22

		Node Price	HAY equiv	
Market Based Averages	**Trustpower Volume Weighted Hedge Bugs (excl Tilt PPAs)**	see detail	$81.53	as at 30-Dec-2020
	ASX Closing Prices OTA	$171.98	$161.48	as at 09-Mar-2021
	ASX Closing Prices BEN	$158.74	$167.09	as at 09-Mar-2021
	Implied HAY avg		$164.29	Current pricing showing high due to gas risks and hydrology
	Indicative "rolling third" ASX indication at HAY		**$91.31**	Derived from ASX average for new FY during previous 3 Novembers. See Note 1 for detail.
	Energy Link HAY		$93.37	Energy Link Price Path (Jan-21)
	Energy Link BEN	$90.19	$94.94	Note : Energy Link were modelling 20% likelihood of Tiwai closing Aug 2021

Recommendation	**Wholesale Budget Price**	**HAY**	**$91.31**	$5.81 higher than FY21 : based on 'rolling third' ASX with latest LF adj.
		BEN	**$86.80**	$3.30 higher than FY21 : as above.
		HLY	**$95.42**	$6.42 higher than FY21 : as above.
		OTA (based off HAY)	**$97.25**	$6.16 higher than FY21 : as above.
	Transfer Price (Generation Hedges)	**HAY**	**$91.31**	Based on recommended wholesale budget price.
	Transfer Price (Retail Hedges)	**HAY**	**$93.31**	Maintained at $2/MWh, Energy Trading margin above generation hedges.
				(To be combined with fixed flat fee of $200K per month).

Note 1: ASX Components as follows :

		OTA	BEN	HAY (implied)	HLY (implied)
FY22	Nov-18	$81.12	$75.69	$77.92	$81.43
	Nov-19	$96.92	$86.68	$91.12	$95.22
	Nov-20	$113.55	$98.02	$104.90	$109.62
	Average 3 Novs	**$97.20**	**$86.80**	**$91.31**	**$95.42**

Figure 1: Transfer Price Inputs and Recommendation

2.2 Monthly Price Shape at Reference Nodes

To establish a monthly price shape from the annual baseload price at the reference nodes (HLY, HAY and BEN), we first assess HLY for a general NZ price shape using a blend of inputs (refer Figure 2). Compared to FY21, the proposed shape is slightly more heavily weighted from June to August and slightly lighter from January to March.

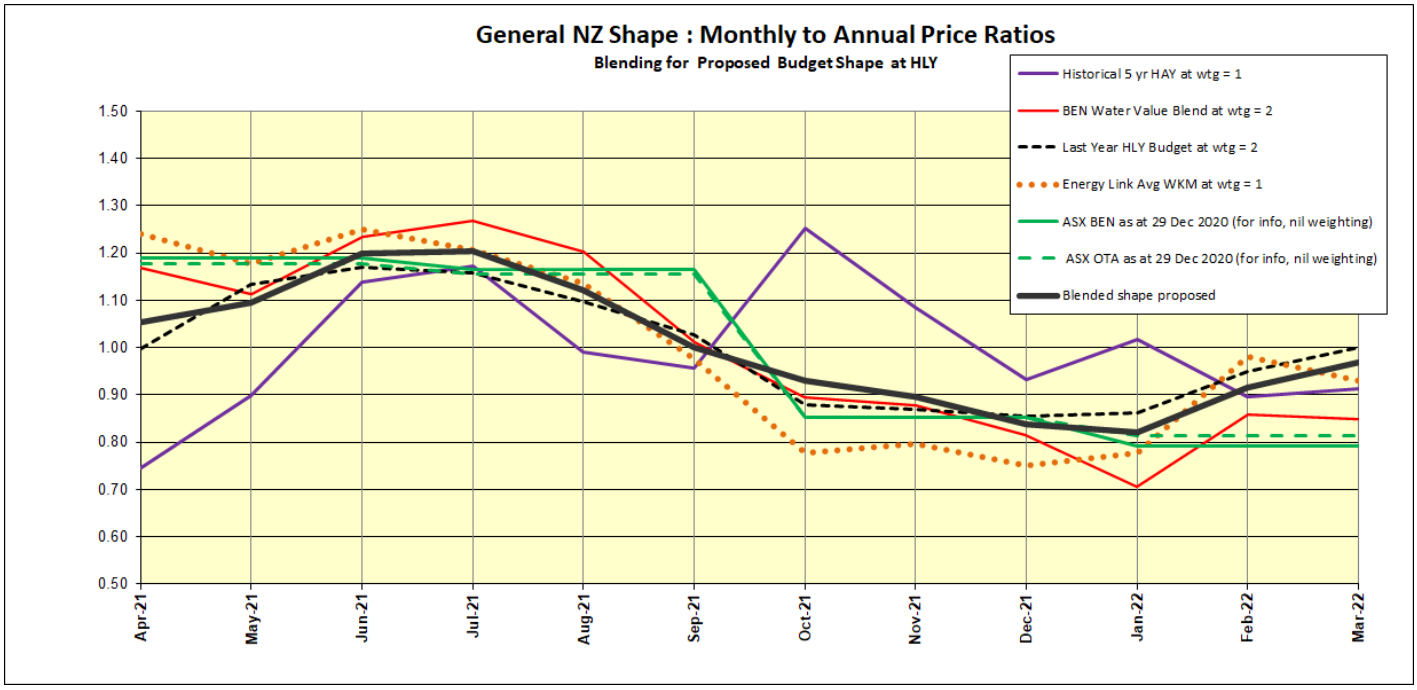


Figure 2: General NZ Shape Factors

At the next step, HAY and BEN monthly prices are derived via proposed location factors (LFs) as price ratios to HLY, shown at Figure 3. As was the case for FY21, North flow is expected to predominate (ie, HLY price exceeds HAY price, which exceeds BEN price for all months). The general price levels are elevated over those of FY21, especially over winter months.

The result is then tuned to give rounded annual prices of $95.42 at HLY, $91.31 at HAY and $86.80 at BEN as targeted at sect 2.1.

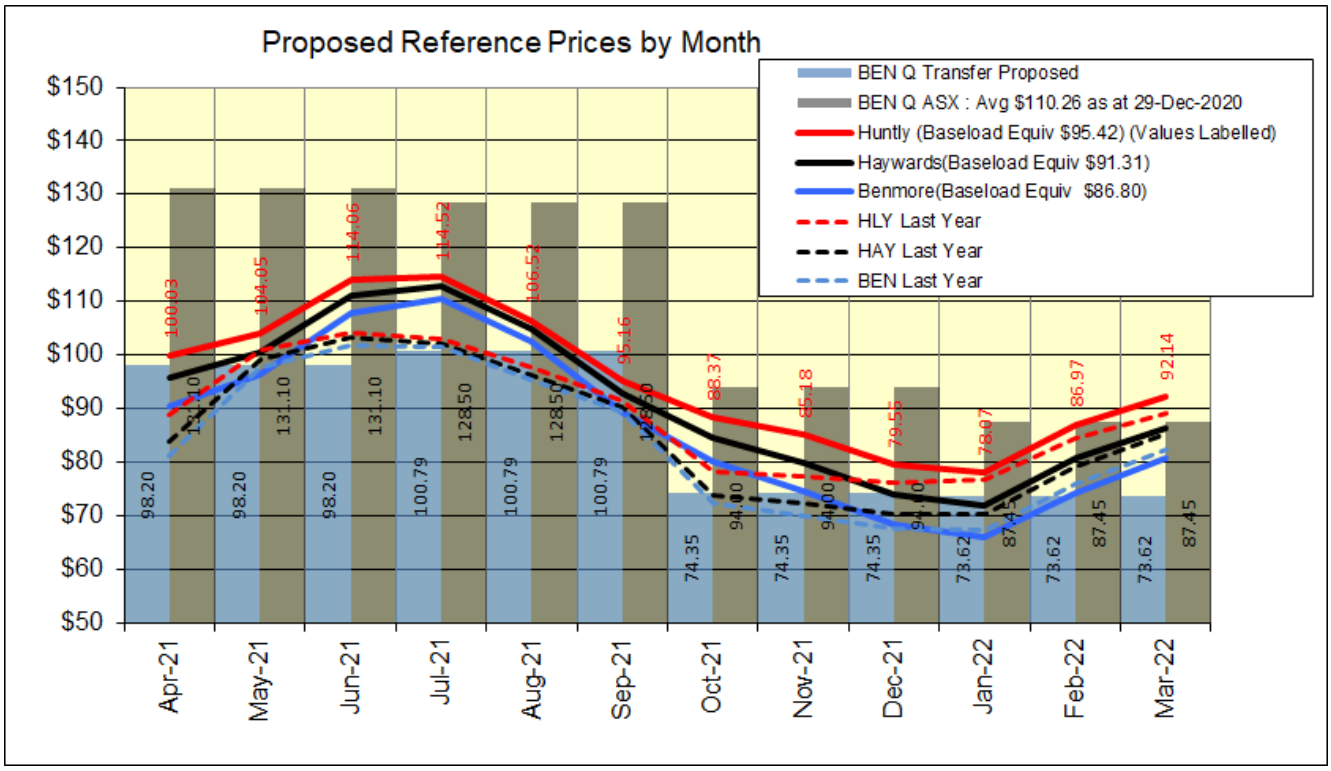


Figure 3: Proposed Reference Node prices

Weekday/Weekend and Day/Night (timeslot) shapes are then derived, based on historically observed ratios, to give the result at Figure 4.

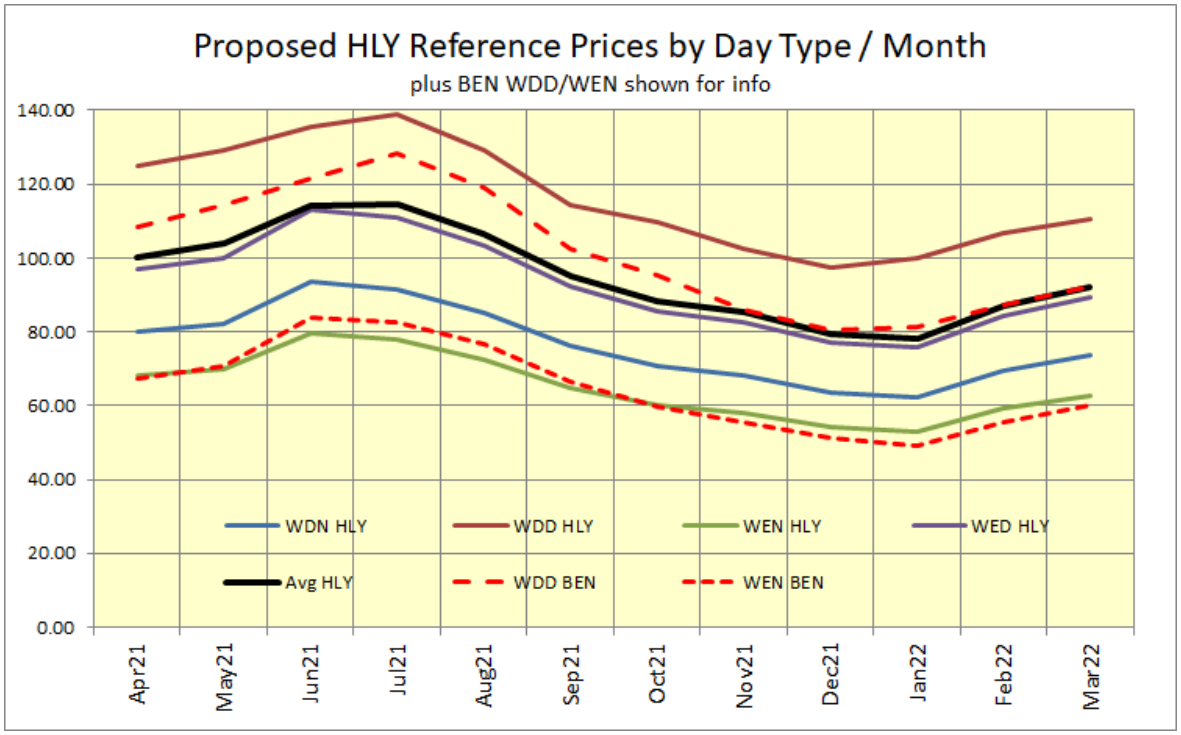
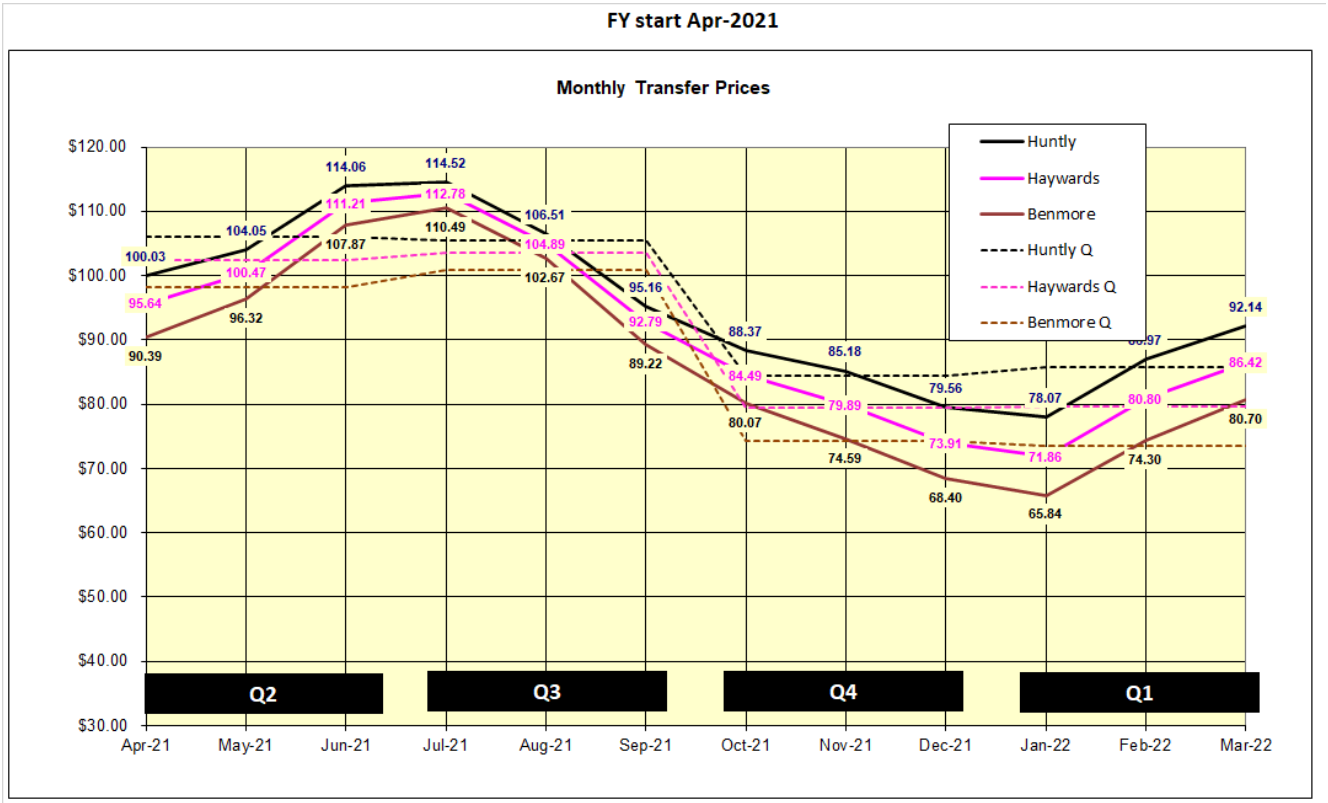


Figure 4: Proposed Timeslot Prices

The overall result is a new set of transfer prices at Reference Nodes by timeslot as shown at Figure 5.



			Q2			Q3			Q4			Q1		
Huntly	**$/MWh**		Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
1	Weekday	Night	79.93	82.10	93.41	91.50	85.11	76.04	70.61	68.06	63.57	62.38	69.49	73.62
2	Weekday	Day	125.06	129.02	135.73	138.73	129.03	114.23	109.82	102.33	97.56	100.00	106.61	110.37
3	Weekend	Night	68.00	69.70	79.82	77.85	72.41	64.69	60.07	57.91	54.08	53.07	59.12	62.64
4	Weekend	Day	97.04	99.90	112.93	111.10	103.33	92.32	85.73	82.63	77.18	75.74	84.37	89.39
Huntly Avg $95.42	**95.42**		100.03	104.05	114.06	114.52	106.51	95.16	88.37	85.18	79.56	78.07	86.97	92.14
				106.02			105.52			84.36			85.69	

Haywards	**$/MWh**		Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
1	Weekday	Night	76.42	79.27	91.08	90.11	83.81	74.14	67.51	63.83	59.06	57.41	64.56	69.05
2	Weekday	Day	119.58	124.57	132.34	136.62	127.07	111.38	105.00	95.98	90.64	92.04	99.04	103.51
3	Weekend	Night	65.02	67.29	77.83	76.67	71.31	63.08	57.44	54.31	50.24	48.85	54.93	58.75
4	Weekend	Day	92.78	96.46	110.11	109.41	101.76	90.02	81.97	77.50	71.70	69.71	78.39	83.84
Haywards Avg $91.31	**91.31**		95.64	100.47	111.21	112.78	104.89	92.79	84.49	79.89	73.91	71.86	80.80	86.42
				102.41			103.61			79.43			79.65	

Benmore	**$/MWh**		Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
1	Weekday	Night	80.42	84.74	99.22	98.31	91.35	79.38	71.24	66.36	60.86	58.58	66.11	71.81
2	Weekday	Day	108.49	114.56	121.49	128.20	119.13	102.52	95.50	85.76	80.42	81.14	87.31	92.50
3	Weekend	Night	67.45	70.91	83.73	82.45	76.62	66.58	59.75	55.66	51.04	49.13	55.44	60.22
4	Weekend	Day	83.35	87.86	102.71	101.89	94.68	82.27	73.84	68.78	63.07	60.72	68.52	74.42
Benmore Avg $86.80	**86.80**		90.39	96.32	107.87	110.49	102.67	89.22	80.07	74.59	68.40	65.84	74.30	80.70
				98.17			100.93			74.35			73.59	

Figure 5: Proposed Transfer Pricing by Reference Node / Timeslot

2.3 Mass Market Peaking and Location Factors

A component of Mass Market (MM) hedge pricing is the expected Peaking Factor (PF = LWAP / TWAP[3]) for the hedged load. Mass Market load has been analysed at the level of retail's Energy Balance Areas (EBAs) at selected GXPs. A summary chart of broad historical PF trends by region is shown at Fig. 6. Charts showing individual GXPs are available on request.

Regional average peaking factors have shown a lift over the last 12 months after more general declines since 2017. The recent lifts are due to an increased correlation between mass market load (which peaks in July) and average spot price (which peaks at more random times during the year, depending on market conditions, but did peak in Jun/July of 2020)). Another contributing factor may be the increasing prevalence of smart meters, which allow retailers to pay for mass market load on a half-hour profile rather than the generic mass market default profile. After internal review[4] it was agreed that the recent lift may not be a sustainable trend, and given the pricing implications for customers it is considered prudent to maintain MM peaking factors at the same levels as were applied for FY21, which are as follows :

- Upper North : 1.06
- Lower North : 1.04
- Upper South : 1.04
- Lower South : 1.03

These settings allow for further review in 12 months to establish whether the upwards trend has been maintained during FY22..

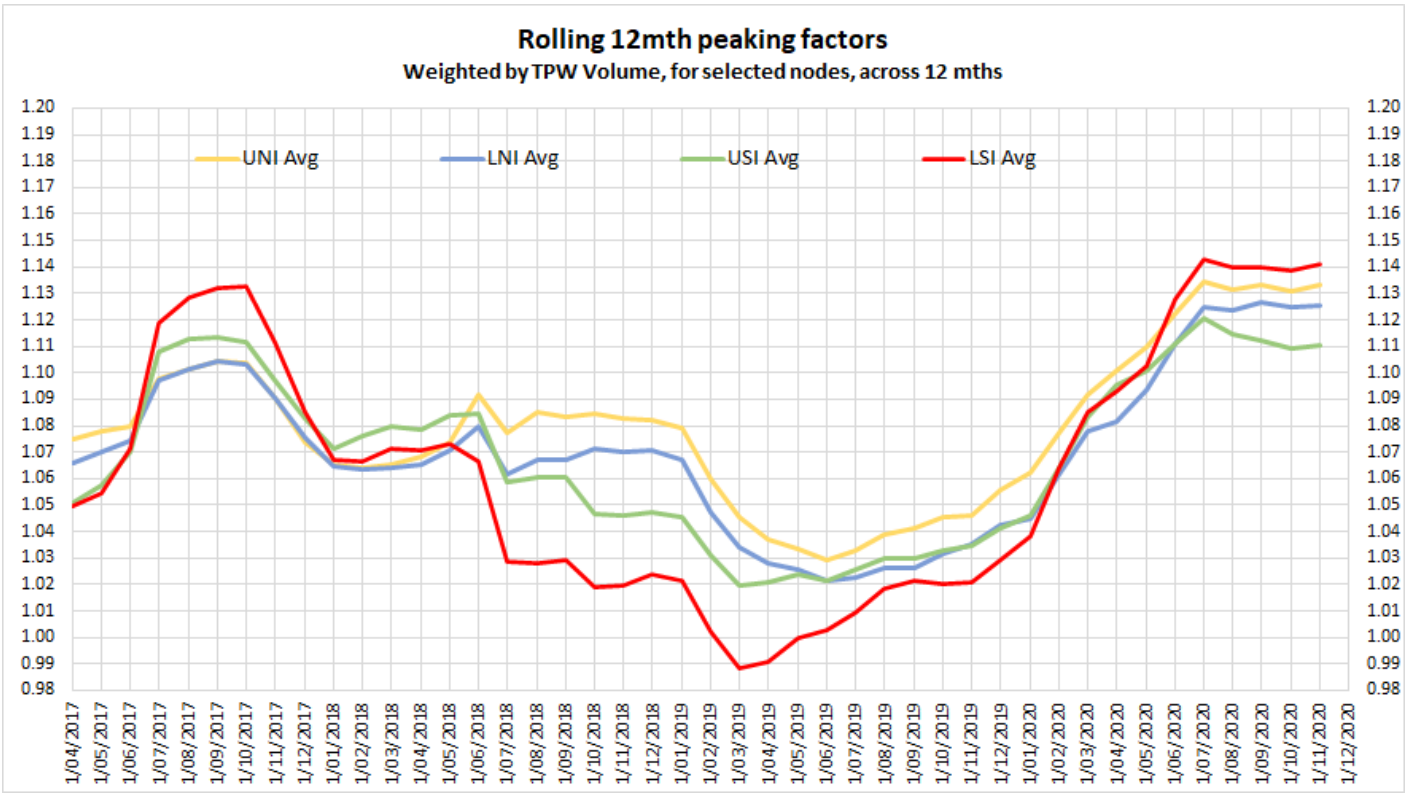


Figure 6: Mass Market Peaking Factor Trends

[3] LWAP = Load Weighted Average Price; TWAP = Time Weighted Average Price

[4] Refer discussions GM Markets / GM S&G

A similar analysis of location factors (LFs[5]) to the relevant reference nodes indicates the adjustments proposed at Figure 7. Upper NI regional factors are referenced to HLY, Lower NI to HAY, and all South Island to BEN. Detailed trend plots are available by area.

MASS MARKET LOCATION FACTORS				
	EB Area	Prev FY	New FY	Change
UNI	AIA	1.035	1.035	0.00
	AKC	1.035	1.035	0.00
	AKN	1.035	1.035	0.00
	BOP	0.970	0.970	0.00
	COU	1.040	1.050	0.01
	EAS	1.000	1.000	0.00
	HAM	1.010	1.010	0.00
	HBP	1.020	1.020	0.00
	KCE	1.000	1.000	0.00
	NTP	1.070	1.060	-0.01
	ROT	0.980	0.980	0.00
	TGA	0.980	0.980	0.00
	THM	1.050	1.050	0.00
	TOP	1.090	1.080	-0.01
	TPO	0.960	0.960	0.00
	WPA	1.010	1.010	0.00
	WRO	1.000	1.000	0.00
	Average UNI	1.017	1.016	0.00
LNI	CHB	1.040	1.040	0.00
	LVN	1.010	1.010	0.00
	MAN	1.010	1.010	0.00
	NPL	1.010	1.000	-0.01
	WAN	1.030	1.030	0.00
	WRR	1.030	1.030	0.00
	SCP	1.020	1.020	0.00
	WGN	1.010	1.010	0.00
	Average LNI	1.020	1.019	0.00
USI	ASH	1.050	1.050	0.00
	BLR	1.100	1.100	0.00
	CCC	1.070	1.080	0.01
	MPR	1.130	1.140	0.01
	MRL	1.150	1.160	0.01
	NEL	1.120	1.130	0.01
	TAS	1.120	1.130	0.01
	WSC	1.100	1.100	0.00
	Average USI	1.105	1.111	0.01
LSI	INV	1.000	1.000	0.00
	OMU	1.050	1.050	0.00
	OTG	1.030	1.030	0.00
	STH	1.000	1.000	0.00
	TIU	1.040	1.040	0.00
	CTR	0.980	0.980	0.00
	QTN	1.010	1.010	0.00
	DUN	0.990	0.990	0.00
	Average LSI	1.013	1.013	0.00

Figure 7: Mass Market Location Factors

[5] Location Factor = Price Ratio = TWAP at local node / TWAP at reference node

2.4 Mass Market Transfer Prices

Applying all the above inputs, and adding a $2 trading margin effective at the reference nodes, gives the MM transfer prices, with resultant changes in average annual prices summarised in Figures 8 and 9.

Prices have increased across all EB Areas, due mainly to the increase in basis price explained under sect 2.1. The average price increase on a volume weighted basis is 4.5%, or 0.44c/kWh. The largest increases are generally in the Upper North Island due to the higher basis price uplift at the Huntly reference node. Minor differences also result from the changes to location factors and general price shape relative to expected monthly load.

The smallest increases are in the lower South Island (QTN, STH and DUN) due to their unchanged location factors and smaller reference node price increase.

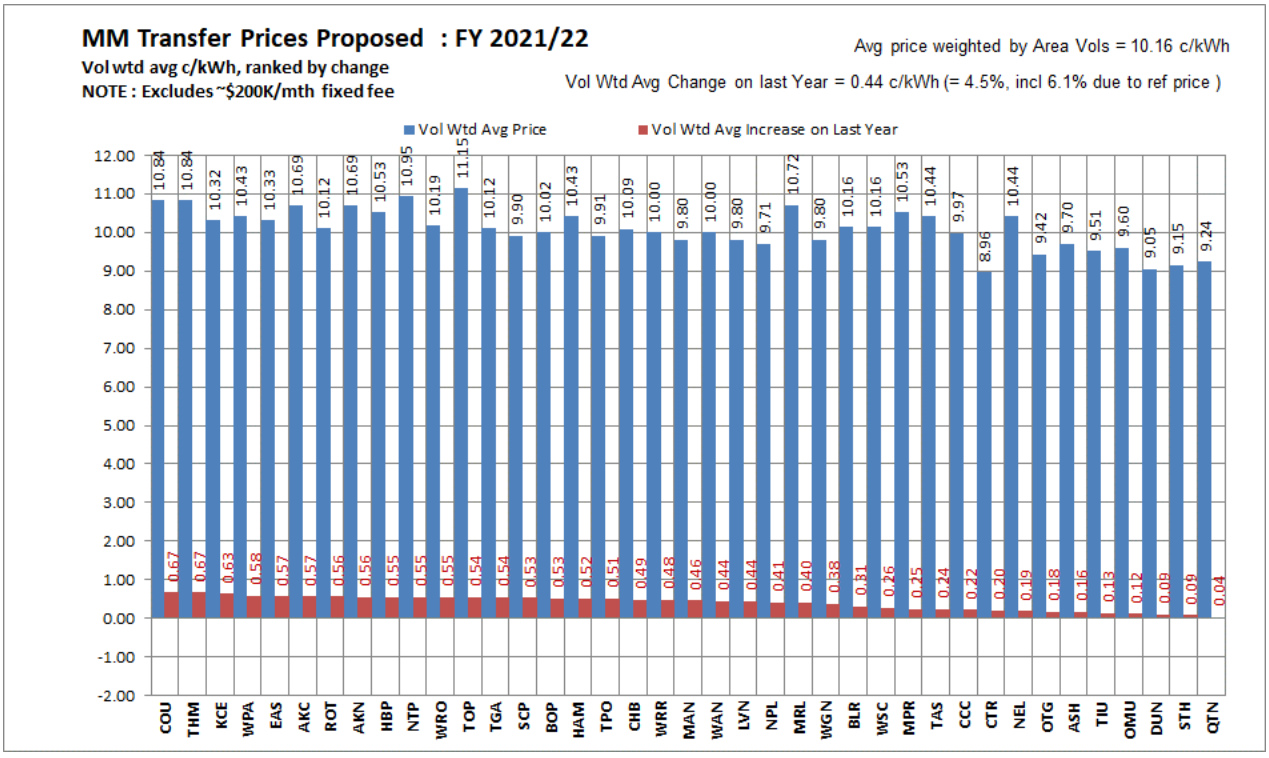


Figure 8: Mass Market Transfer Price Changes

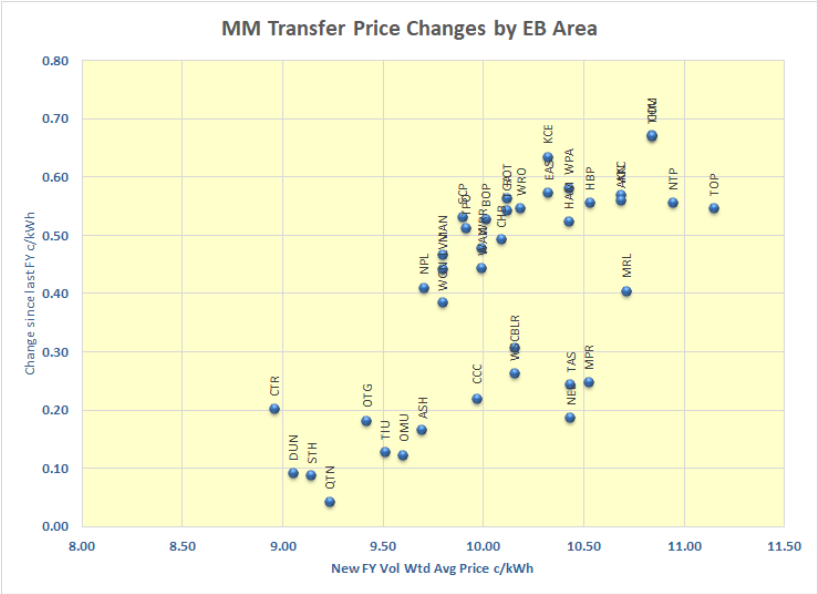


Figure 9: Mass Market Transfer Price Changes

2.5 Generation Location Factors

Consistent with the approach above, location factors for all generation hedge nodes are also derived. These are all within 1% of FY21 values, as summarised at Figure 10.

GENERATION LOCATION FACTORS					
	Hedge Node	Ref Node	2020/21	2021/22	Change
Branch	ARG1101	BEN2201	1.12	1.12	0.00
Waihopai	ARG1101	BEN2201	1.12	1.12	0.00
Highbank	ASB0661	BEN2201	1.05	1.05	0.00
Tararua I & II	BPE0331	HAY2201	1.01	1.01	0.00
Waipori	BWK1101	BEN2201	0.99	0.98	-0.01
Cobb	STK0661	BEN2201	1.13	1.13	0.00
Coleridge	COL0661	BEN2201	1.01	1.01	0.00
Patea	HWA1101	HAY2201	1.01	1.00	-0.01
Mahinerangi Wind Farm	HWB0331	BEN2201	0.99	0.98	-0.01
Arnold	KUM0661	BEN2201	1.10	1.10	0.00
Kanerie/McKays Creek	KUM0661	BEN2201	1.10	1.10	0.00
Kumara/Dillmans/Duffers	KUM0661	BEN2201	1.10	1.10	0.00
Wahapo	KUM0661	BEN2201	1.10	1.10	0.00
Matahina	MAT1101	HLY2201	0.94	0.94	0.00
Paerau/Patearoa	NSY0331	BEN2201	1.01	1.00	-0.01
Wheao	ROT1101	HLY2201	0.97	0.98	0.01
Mangorei	SFD0331	HAY2201	1.01	1.00	-0.01
Motukawa	SFD0331	HAY2201	1.01	1.00	-0.01
Kaimai	TGA0331	HLY2201	0.98	0.99	0.01
Tararua III	TWC2201	HAY2201	1.01	1.00	-0.01
Hinemaiaia	WRK0331	HLY2201	0.96	0.96	0.00
Bream Bay	BRB0331	HLY2201	1.06	1.06	0.00
Montalto	ASB0661	BEN2201	1.05	1.05	0.00
Deep Stream	HWB0331	BEN2201	0.99	0.98	-0.01
Esk	RDF0331	HLY2201	0.98	0.99	0.01

Figure 12: Generation Location Factor Changes

These location factors are applied to the reference node transfer prices to derive the internal hedge prices for Generation selling to Energy Trading. The volumes for these hedges are set by Generation based on rolling average station output figures and the corresponding peaking ability of the stations.