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Review of the Electricity Authority discussion paper "Inefficient Price Discrimination in the wholesale market – issues and options"

Subject

The Authority is reviewing the wholesale market with a focus on whether spot prices are determined competitively.

The Authority has requested a peer review of the two resulting papers. The first is an empirical paper, "Electricity Spot Prices in the Wholesale Market 2018-2021" ("the Review"), that is diagnostic in nature. The second is a discussion paper that explores potential responses to what the first paper has identified.

For the discussion paper the Authority is specifically interested in:
  - Is the problem definition precise and does it reflect the evidence?
  - Are the criteria the right ones, could any be added or subtracted?
  - Is the option set complete?
  - Is the assessment robust?

This current letter provides my review of the discussion paper, "Inefficient price discrimination in the wholesale market – issues and options" ("the issues and option paper"). The Annexes to this letter provide details regarding the points covered in this letter.

In undertaking this review of the paper, I have relied upon the information provided by the Authority, including some information supplied by certain market participants to the Authority on a confidential basis. Consistent with my role as specified, I have not attempted to independently verify the analysis underlying the assertions made in the paper.

In preparing this letter, I have benefited from discussions with David Hunt and his colleagues at Concept Consulting Ltd (who are also undertaking a review for the Authority). However, the opinions expressed in this letter should not be interpreted as representing the views of any one other than myself.

Except as expressly provided for in my engagement terms, I do not accept liability for errors or omissions in this letter or for any consequences of reliance on its content or conclusions or related correspondence.

My assessment as to whether the problem definition is precise and does it reflect the evidence

The issues and options paper's executive summary explains that it is an immediate response to the observation in the Review that "*the price discrimination implicit in the contracts between Meridian Energy, Contact Energy and New Zealand Aluminium Smelters* ["the Tiwai contracts"] *raises the possibility that electricity may not have been allocated efficiently*". The summary states "*The*

Authority is addressing inefficient price discrimination in the wholesale market as a priority because there appears to be sufficient evidence to indicate inefficiencies are potentially significant with material implications for consumers and generators". The paper notes that the Authority is using the contracts to illustrate the potential for an inefficiency that may be worth addressing but has not determined that the Tiwai contracts were inefficient at the time they were negotiated.

My assessment is that the issues and options paper is successful in using the Tiwai contracts to explain, and thereby define, the problems that concern the Authority.

Page 22 of the paper's Table 1 sets out a "*Summary of the problem definition*". This includes the comment "*With inefficient price discrimination, the right consumers are no longer consuming the right amounts of electricity – the allocation of electricity to different consumers may be inefficient or the cost of producing electricity may be higher than people value it at.*" This does not define the right consumers or the right amount but the discussion in earlier sections of the paper has provided a more precise explanation, namely that inefficient price discrimination results in some consumers being favoured with lower prices who have a lower valued use for the electricity than other consumers or potential consumers who consume less or not at all because they face higher prices and/or the cost of producing electricity may be higher than the value of its use.

The paper appropriately acknowledges that any assessment as to the inefficiency of the contracts is complicated by uncertainty as to whether the use of electricity by NZAS, facilitated by the Meridian Contract for Differences ("CFD") lowering the price, is sufficiently valuable a use that it compensates for the alternative uses of electricity which are curtailed by the spot price being higher than if NZAS ceased consumption. The crucial problem created by price discrimination is that the benefitting party is not required to prove that their consumption is a higher value use by paying more than alternative purchasers are prepared to pay.

NZAS, as party to a negotiation with Meridian, are incentivised not to reveal the value to them of electricity consumption, ie their willingness to pay (WTP), neither during nor after a successful negotiation.

The paper notes that the only time that NZAS's owners have revealed an upper bound on their WTP was on 9 July 2020 when Rio Tinto announced to the ASX that "It is very unfortunate we could not find a solution with our partners to secure a power price reduction aimed at making NZAS a financially viable business. We will therefore terminate the power contract and move to close the operation."[1]

The paper notes that Authority wants to support efficient decision-making by parties based on the information available to them when decisions are made. Accordingly, subsequent developments after contracts are agreed are not directly relevant for assessments of the efficiency effects of the price discrimination negotiated in the contracts. I agree that the actual evolution of prices, after the date an agreement is accepted or rejected, is not a valid basis for assessing whether there is a case for policy changes to address the risk of inefficient price discrimination.

Appendices B and C of the issues and options paper provide an informative graphical illustration of the potential allocative inefficiency resulting from the price discrimination in the contracts. Para 5.20 of the paper presents the results of the Appendix B and C analyses in Table 2. The table refers to "Generator and NZAS losses" because the amount shown in the table suppresses the larger gain of

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[1] Under Australian law and ASIC regulation, announcements to the ASX must not be false, misleading or deceptive and must be clear, accurate and complete
https://download.asic.gov.au/media/1336820/disclosure-role-asx-gibson.pdf

producer surplus by the Generators resulting from the wealth transfer from RoNZ consumers. Para 5.18 does advise the size of the wealth transfer, but the reader's understanding could be improved if Table 2 displayed the results inclusive of the wealth transfer, as well as with that amount suppressed.[2]

As part of my review, in Annex 1 of this letter I have confirmed the calculation of the estimate of efficiency loss reported in Table 2 of the paper. Table 2 provides estimates of the efficiency loss for two assumptions regarding the avoidable cost of supplying NZAS. The alternative assumptions are that the avoidable cost is the $70/MWh or $90/MWh. If the strike price paid under the CFD is less than the avoidable (ie incremental) cost, the Tiwai contracts provide a subsidy to NZAS of the difference between the avoidable cost and the strike price.[3]

The valuation of the inefficiency reflects the issue, often encountered in international trade analyses, that in the short-term price elasticities are small and thus the inefficiency effects of price discrimination are small relative to the wealth transfer effects. The valuation of the inefficiency effects is not able to reflect longer term implications. Dynamic effects, which in the current case include effects on investment and the entry into competition with incumbents ie generators, can often be much larger than short term effects.

Annex 2 explains why I conclude the paper does establish that Meridian's decision to agree to the Tiwai contracts confirms that the Code does not provide effective incentives to deter materially inefficient price discrimination. This does not imply the Tiwai contracts themselves are necessarily inefficient.

In summary, I consider the paper reflects the evidence and is successful in using the Tiwai contracts to explain, and thereby define, the problems that concern the Authority.

My assessment of the criteria and whether additional criteria should be added or some removed

I consider that the criteria are an appropriate set on which to seek submissions. I have not myself been able to identify any additions or subtractions that would improve the set apart from the above suggestions.

The paper appropriately offers submitters the opportunity to comment on the criteria.

My assessment as to whether the option set is complete

I have reviewed the options to see whether I can identify other options sufficiently likely to be relevant to address the problem as defined. I have also considered whether the options proposed in the draft paper are themselves sufficiently likely to be relevant to warrant seeking submissions on

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[2] Admittedly, Oliver Williamson suggests "*Estimating the value of consumers' surplus by the Marshallian triangle follows the common (and broadly defensible) practice of suppressing the income effects associated with a price change*" but later treats income effects as a consumer welfare issue, in the paper referred to the Court of Appeal's comment "*We define producer and consumer surplus following Oliver Williamson: see Oliver E Williamson "Economies as an Antitrust Defense: the Welfare Tradeoffs" (1968) 58 Am Econ Rev 18*." (Footnote 46, NZME LIMITED v COMMERCE COMMISSION [2018] NZCA 389 [26 September 2018].)

[3] Commerce Commission EDB-GPB Input Methodologies Reasons Paper Dec 2010 Footnote 354, p178 https://comcom.govt.nz/__data/assets/pdf_file/0019/62704/EDB-GPB-Input-Methodologies-Reasons-Paper-Dec-2010.pdf

them. I have not identified other options and conclude the option set is appropriate and relevant. The paper invites submitters to suggest further options if they identify them.

In accordance with my brief, I have not evaluated the options other than whether they are sufficiently relevant to addressing the problem as defined.

I consider that the way the structural change options, requiring action by the other agencies or the Government, are listed and discussed is appropriate. I have not attempted to evaluate the commentaries on these options since they express the view of the Authority.

My view on whether the assessment of the options is robust

My perspective is that the draft paper is an issues and options paper intended to obtain submitters' views regarding the options. These views would then be an input into the Authority's decisions regarding what analysis is required before proposing for consultation a course of action to address price discrimination issues, including those arising from the Tiwai contracts.

I agree with Authority's framing of the objective of the paper as being to present sufficient discussion of the options that the parties being consulted are alerted to the key issues relevant to assessment of the options (as opposed to attempting to offer robust assessments of the options in this paper).

Thus, the purpose of the paper is to ensure that the submissions received can serve the purpose of informing the Authority on the matters and analyses that interested parties believe should be considered in deciding which options to address the price discrimination issues will be explored in depth.

I consider that the current draft of the paper does alert the reader to sufficient key issues that submitters will be prompted to provide submissions. That should enable the Authority to identify which options warrant exploration in depth[4].

The above objective relieves the Authority of the burden of achieving a fully rigorous balance in the statement of pros and cons, which would be a very time-consuming task.

Some submissions may suggest considerations or options where it would be useful for the Authority to obtain alternative views before deciding which options will be explored further. Accordingly, I suggest that the Authority advise submitters that it may decide to call for cross-submissions after considering whether the submissions received suggest that a cross-submissions would add value to the consultation.

Conclusion

In summary, the discussion paper is successful in using the Tiwai contracts to explain, and thereby define, the problems that concern the Authority. The discussion is carefully crafted and suitably cautious in inviting submitters to comment on the analysis and conclusions.

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[4] Submissions will probably view some options as unrealistic, eg that approval of contracts involving price discrimination could be based on the Authority assessing whether the purchaser's willingness to pay would in fact equal the market price (after cost adjustments for size etc). Generators would be reluctant to expose themselves to the Authority's approval indicating they had conceded a lower price than necessary.

The identification of options, the criteria for their assessment and the discussion of the options are suitable for the purpose of alerting interested parties to key considerations and obtaining their views on those consideration plus additional considerations that maybe relevant.

It is apparent that considerable resources have been applied in preparing this thoughtful paper.

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ANNEX 1

Confirmation of the Base case Loss of Efficiency Estimates

This Annex confirms the base case Loss of Efficiency Estimates as set out in Table 2 of the paper.

The baseline calibration used in the paper is as follows:

- RoNZ price elasticity ε = -0.1 (modified from empirical estimates);[5]

- RoNZ annual consumption based on 2019 annual MWh (36.454TWh);[6]

- NZAS consumption based on 572MW (as per maximum contracted amount);

- Smelter WTP = $45/MWh (approximation based on NZAS' bounded WTP at 9 July 2020);

- The operating and maintenance cost from deploying otherwise stranded water to generate electricity is assumed to be $8/MWh;

- Average price under exit scenario = $70/MWh (in line with Benmore futures after NZAS exit was announced 9 July 2020, with an adjustment to approximate an average, whole-of-New Zealand price);

- Average price under 'stay' scenario = $90/MWh (in line with Benmore futures prices after ongoing negotiations were confirmed by NZAS 28 August 2020 and estimates of the levelised cost of electricity);[7]

- Average stranded water = 140MW (annual analysis assuming transmission constraints are resolved post-2022).

- Alternative assumptions regarding cost of generating electricity to supply NZAS consumption

  Maximum Estimate: Cost per MWh = Stay Price
  Minimum Estimate: Cost per MWh = Exit Price

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[5]   Empirical estimates suggest that the short-run price elasticity for demand is about -0.25. Since wholesale generation is about 1/3 of the total cost of electricity for residential consumers (and a larger contribution for grid-connected consumers) a value of -0.1 is used to estimate the response of consumers to a change in wholesale electricity price. While the elasticity driving an instantaneous response to a wholesale price change may be low because many consumers are hedged, over the life of a four year contract more adjustment of consumption is expected to occur.

[6]   Note that 2019 consumption for RoNZ consumers was chosen for the baseline because the Covid lockdown in 2020 disrupted electricity consumption. Note that NZAS's surplus would only change if the CFD contract price, NZAS's WTP or the quantity of electricity consumed by NZAS were amended, but these three elements are held constant in both tables

[7]   See the generation stack reports at https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-publications-and-technical-papers/nz-generation-data-updates/.

ASSUMPTIONS	Formulae		Base Case
Elasticity Demand	ElasticityD		-0.100
			Prices ($/Mwh)
Exit Price	PriceExit		70.000
Stay price	PriceStay		90.000
WTP	PriceWTP		45.000
Stranded Water cost per MWh	StrandedWaterCostperMWh		8.000

Energy (Use of Generation)		*Power (MW)*	*Energy (TWh)*
Stranded Water	EnergyStrandedWater	140.000	1.226
Q' (RoNZ Electricity Consumption- Stay Scenario)	EnergyusedbyRoNZinStayScenario [D20]		36.454
Qexit to Q' (RoNZ Additional Electricity Consumption in Exit Scenario) (Therefore Cost = Exit Price)	EnergyusedbyRoNZinStayScenario*ElasticityD*(PriceExit-PriceStay)/PriceStay [D20 * D5 * (D10 - D9) / D10]	92.476	0.810
NZAS Electricity Consumption in Stay Scenario	PowerNZASCons*8760/1000000 [C24*8760/1000000]	572.000	5.011
Qstay to Qexit (Change in Overall Electricity Consumption - Stay vs Exit)	EnergyusedbyNZASinStayScenario-ChgofRoNZConsumption [D24-D22]	479.524	4.201
Qstay to Qexit Adjusted for Spill (ie change in Overall Consumption less Spillage)	ChgEnergyTotal-EnergySpill [D26-D18]	339.524	2.974

RESULTS			*Dollars ($M)*
NZAS Consumer Surplus + **Generator** Revenue from NZAS	EnergyusedbyNZASinStayScenario*(PriceWTP-StrikePrice) + EnergyusedbyNZAS*StrikePrice = EnergyusedbyNZASinStayScenario*PriceWTP		225
RoNZ - Loss Consumption Surplus	0.5*ChgofRoNZConsumption*(PriceExit-PriceStay) [0.5*D22*(D9-D10)]		-8

Generators Change in Non-NZAS Revenue and Costs			
Generator - Revenue from RoNZ Exit Scenario additional consumption (Lost in Stay Scenario vs Exit Scenario)	ChgofRoNZConsumption*PriceExit [D22*D9]		57
Generator - Cost of Spill (Spill*8)	EnergySpill*SpillUnit Cost [D18*D14]		10
Generator Upper Bound Change in Cost ((Qstay - Qexit - Spill)*Pstay + Spill* 8)	AdditionalEnergyrequiredtoSupplyNZASlessWouldbeSpilled*PriceStay + CostofSpillageforGen [D28*D10 + D45]		277
Generator Lower Bound Change in Cost (Qstay - Qexit - Spill)*Pexit + Spill* 8)	AdditionalEnergyrequiredtoSupplyNZASlessWouldbeSpilled*PriceExit + CostofSpillageforGen [D28*D9 + D45]		218

Efficiency Change			
Generator Loss (Max Cost Extra Electricty Gen) + NZAS Gain	EnergyusedbyNZASinStayScenario*PriceWTP-RevforGenfromRoNZChgConsinExitScenario - ChgofCostforGen_Max		**-109**
Generator Loss (Min Cost Extra Electricty Gen) + NZAS Gain	EnergyusedbyNZASinStayScenario*PriceWTP-RevforGenfromRoNZChgConsinExitScenario - ChgofCostforGen_Max		**-49**
RoNZ Loss Consumption Surplus	ChgSurplusofRoNZ [D37]		**-8**
Overall Efficiency Loss (Assuming Max Cost of Extra Electricty Generation in Stay Scenario vs Exit Scenario)	GeneratorplusNZASMaxChgSurplus+LossofRoNZSurplus		**-117**
Overall Efficiency Loss (Assuming Min Cost of Extra Electricty Generation in Stay Scenario vs Exit Scenario)	GeneratorplusNZASMinChgSurplus+LossofRoNZSurplus		**-57**
RoNZ Wealth Transfer	EnergyusedbyRoNZinStayScenario*(PriceExit-PriceStay) [D20*(D9-D10)]		**-729**

ANNEX 2

IMPLICATIONS OF THE PRICE DISCRIMINATION IMPLEMENTED BY THE TIWAI CONTRACTS

The Tiwai contracts implement price discrimination in favour of NZAS (there would be no rational for the contracts of for the strike price to be confidential unless the strike price in the CFD was less than the forward price at the time the contracts were executed). The policy issue is whether Meridian and Contact actions in entering into the Tiwai contracts imply that a regulatory intervention may be required because the Code does not adequately deter materially inefficient price discrimination, given the current generation cost configuration.

Meridian can afford to provide NZAS with a large discount from the forward price, and potentially even from the avoidable cost, because NZAS continuing to consume around 13% of total generated power results in the marginal cost of generation, and therefore the spot price, being much higher than Meridian's average cost.

Given Meridian had a strong incentive to ensure NZAS continued to consume a significant proportion of total electricity demand, the policy question is whether the market processes under the Code provide any incentive or mechanism for efficiency considerations to influence Meridian's decision to price discriminate in favour of NZAS, potentially including providing a subsidy.

The factor determining whether the Tiwai contracts result in an inefficient allocation of electricity, between NZAS and the rest of New Zealand consumers, is NZAS's willingness to pay. The test of efficiency is that NZAS was in fact willing to pay the same effective price over the contract period as the rest of New Zealand faced at the time the contracts were signed (ie an appropriate weighting of the then forward price).[8] If this test was not meet, the expected result of the contracts when signed was an inefficient allocation of electricity between NZAS and other possible consumers.

As in any negotiation, Meridian will have had to form a view on its counterparty's willingness to pay. There are two scenarios to consider since either Meridian assessed that (a) NZAS's WTP was less than the then forward price or (b) NZAS's WTP was at least as high as the then forward price.

Under scenario (a) the incentives provided by the Code were not effective in deterring Meridian from entering into Tiwai contracts which would result in a material allocative inefficiency if Meridian's assessment was correct. Under scenario (b) the market power of NZAS as a purchaser was so strong that Meridian was prepared to provide a material discount on the forward price despite assessing that NZAS would have continued to operate and consume without any concessional price discrimination let alone a large discount.

The outcome under scenario (b) is that the allocation of electricity is efficient, but that is a fortuitous outcome since NZAS has sufficient market power that Meridian would have provided a much lower price than the forward price in any case, regardless of whether that was efficient or not.

In summary, analysis of Meridian's decision to agree to the Tiwai contracts indicates the Code does not provide effective incentives to deter major inefficient price discrimination. It is possible that NZAS's WTP is high enough that contracts are efficient, but the analysis indicates the Code would not have deterred Meridian from agreeing to inefficient price discrimination contracts.

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[8] The "same effective price" means that the comparison takes into account the discount warranted by the characteristics of NZAS consumption - a large baseload behind a transmission constraint.