Cross submission: UTS preliminary decision

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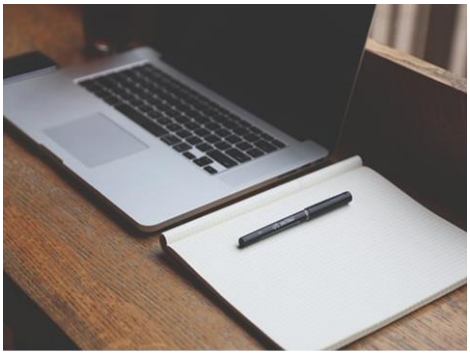

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About the author

Kieran Murray provides expert evidence, testimony and reports in the fields of regulation, competition analysis and public policy, including market design. He has served as an economic consultant on these matters for public agencies and private companies in over 15 countries in the Asia Pacific Region. Kieran co-founded and jointly leads Sapere. He is an expert lay member of the New Zealand High Court and serves as an International Arbitrator for the PNG Independent Consumer and Competition Commission.

Prior to his consulting career, Kieran was instrumental in establishing the (former) wholesale electricity market operator, EMCO; he was responsible for the design and implementation of the wholesale electricity market, NZEM, which went live in October 1996. After leaving EMCO, Kieran held leading roles in projects to advance the market design, including with the Electricity Governance Establishment Project and the Grid Security Project. His expertise in electricity market reform is recognised through subsequent engagements to advise on electricity market institutions and design in Australia (east and west coast markets), Canada, Columbia, the Philippines, Singapore, south-eastern United States, Vietnam, and several Pacific Island nations.

Introduction

1. I have read the submissions received by the Electricity Authority (Authority) on its preliminary Undesirable Trading Situation (UTS) decision. None of the submissions cause me to want to change the analysis I set out in my submission (Murray, 2020). There are some supplemental comments I would like to make in response to the submissions made to the Authority. In this cross submission, I comment on five topics raised in those submissions. These topics are:

   - outcomes consistent with underlying supply and demand
   - perfect or workable competition standard
   - impacts on consumers from generators structuring offers to manage constraints
   - opportunity cost
   - competition is an issue of market design.

Outcomes consistent with underlying supply and demand

2. Several submitters pick up on the references by the Authority, in its preliminary decision, to whether the outcomes it observed reflected "underlying supply and demand" conditions. In describing its approach, the Authority stated that (Electricity Authority, 30 June 2020, p. ii):

> The Authority considered that if wholesale market outcomes reflect supply and demand conditions, then there is no reason for confidence or integrity to be undermined. Conversely, if spot market outcomes vary widely from the underlying supply and demand conditions, then confidence or integrity may have been undermined and a UTS might have developed.

3. New Zealand Steel agreed with the framework adopted by the Authority and drew attention to the paragraph just quoted (New Zealand Steel Limited, 2020, p. 1). The seven applicants also agreed with the logic of the Authority comparing outcomes with underlying supply and demand conditions (Ecotricity, et al, 2020, p 9), as did Genesis (Genesis Energy Limited, 2020, para. 1).

4. However, the difficulty with the test endorsed by these submitters is that outcomes from supply and demand conditions in wholesale electricity markets are not measurable in a vacuum. In markets with any degree of complexity, market outcomes are a function of the market rules. As Coase observes (Coase, 1988, p. 9):

> All exchanges regulate in great detail the activities of those who trade in these markets (the times at which transactions can be made, what can be traded, the responsibilities of the parties, the terms of settlement, etc.), and they all provide machinery for the settlement of disputes and impose sanctions against those who infringe the rules of the exchange. It is not without significance that these exchanges, often used by economists as examples of a perfect market and perfect competition, are markets in which transactions are highly regulated (and this is quite apart from any government regulation that there may be). It suggests, I think correctly, that for anything approaching perfect competition to exist, an intricate system of rules and regulations would normally be needed.

5. The relevant underlying supply and demand conditions are, therefore, not just the physical conditions of production and consumption, but also the rules governing the rights and duties of those carrying out transactions (Coase, 1988, p. 10). The incentives created by the market rules are as inherently an element of the underlying supply and demand conditions as the incentives created by changes in fuel supplies.

6. However, in its test, the Authority sought to compare observed outcomes with the outcomes it might expect from an unspecified trading forum that may have very different trading rules to the current market (and may not reflect any real-world market as discussed further below). Such a test cannot distinguish whether the observed outcomes result from an unforeseen or exceptional situation disrupting normal trading, from market design characteristics, or are the expected results of underlying supply and demand conditions properly defined to include the existing market rules.

Varying from perfection is not a UTS

7. Professor Andy Philpott, Electric Power Optimisation Centre, explains that the Authority "compares observed generator behaviour with what would be expected in a perfectly competitive market" (Philpott, 2020, p. 3). Professor Philpott argues that perfect competition, although arguably unattainable in practice, is a computable benchmark against which market participant behaviour can be assessed. He says that workable competition is difficult to measure or assess and is open to interpretation (Philpott, 2020, p. 3).

8. The Authority's reasoning ought to be as objective, rigorous and transparent as feasible, but a computable benchmark is not a necessary foundation for a UTS assessment. Adopting a perfect competition standard, as the Authority did, may have simplified its modelling but it also introduced material bias into the Authority's assessment of whether a UTS arose.

9. This bias is introduced because the economic theory of perfect competition is not intended to describe real world markets. Rather, it establishes the formal structural conditions for certain theoretical equilibrium outcomes associated with allocative efficiency.[1] In this equilibrium, all firms earn a normal rate of return and resources are efficiently allocated, such that there is no incentive for anything to change and hence the process of competition almost ceases to exist (Hayek, 1948). Firms in a perfectly competitive equilibrium do not alter their prices, do not advertise or differentiate their products or attempt to reduce their costs or innovate. The Authority appeared to recognise these characteristics of the perfect competition concept when it interpreted competition in its statutory objective as meaning workable competition (Electricity Authority, 2011).

10. Critically, a perfect competition standard in which generator offers are limited to some view of cost dispenses with the price discovery role of the wholesale market. The wholesale market would be viewed through some narrow lens focused on efficient dispatch and would not offer

[1] Essentially, for perfect competition these conditions are homogeneous products, an infinite number of buyers and sellers, the absence of economies of scale, independence of action, perfect information and free movement of resources.

any substantial advantage over a more centrally planned approach because economic costs would be assumed to be known, or calculable, in advance. However, efficient economic costs are revealed in the process of price discovery; they are not something that can accurately be determined ex ante for the simple reason that the information required will not be fully available ahead of the price determination process (Yarrow & Decker, 2014). The effectiveness of this process of price discovery is a matter of market design, as discussed further below.

11. A simple example might help illustrate the difference in concepts. Prices in auction-based markets, such as the New Zealand wholesale electricity market, can generally be expected to orbit the offer prices of *second-lowest* cost source of production to meet demand, not the costs of the least cost producer as assumed with perfect competition standards. For example, if three suppliers could each supply one unit at (some definition of production) cost of $55, $60, and $65 respectively, and a single buyer seeks to purchase one unit, competition might be expected to drive the price down to just under $60, say $59.99, as that is where the competition stops.[2] Comparing this market outcome against the first supplier's unit cost of $55 does not inform an assessment of whether the market is operating normally or has become disrupted, because the benchmark of perfect competition does not describe the expected outcomes in such an auction.

12. In real world markets, prices and economic costs that do not vary with production—scarcity rents, premiums for risk, some forms of opportunity cost etc—are jointly and simultaneously discovered or determined via the competitive process. These prices and costs depend on all aspects of underlying supply and demand, including rivals' expectations of others' expectations in infinite regress. Whether the forms of economic rent earned by any plant that is marginal in a particular pricing period or periods are efficient can only be answered over time, extending out for many years or potentially decades—that is, if the net present value of prices (including economic rents) turns out to equal the LRMC of new capacity.

13. A second reason why the Authority's test is biased is that from the viewpoint of standard economic theory, the rules governing wholesale markets for electricity are inherently incomplete. Some incompleteness is inevitable because electricity is a flow, rather than a stock (Wilson, 1999, p. 1). Because electricity is a flow, a property right cannot be assigned by title, and without clear property rights, market transactions cannot arrive at perfectly competitive outcomes. No one owns electricity per se—some entities own generation plant and transmission lines, but these properties are not traded in the wholesale electricity market. Rather, market participants approved by the Authority obtain privileges to inject or withdraw power from the transmission grid at specific locations. These privileges bring obligations to comply with technical rules and procedures for settling accounts based on metered injections and withdrawals. Further, flows on transmission lines are constrained continuously by operational limits and generators must comply with environmental factors and other limitations, and these operational limits and environmental constraints are not all set simultaneously under

[2] Similarly, when multiple buyers bid for a single item, the bidding stops at the price at which the second-last bidder drops out; that is, the price paid by the winning bidder is the second highest of the bidder valuations—the value of the item to the winner is not revealed in the auction, just as the cost of the lowest cost producer is not revealed. For an expanded version of these examples in the context of the Japanese fish market at Tsukiji and auctions for art work and literature, see McMillan, 2002, pp. 65-71.

current market arrangements;[3] therefore, market outcomes cannot reflect outcomes from perfect competition other than by coincidence. The Authority's test meant it assessed observed outcomes against an unobtainable standard.

Consumer benefit of offers to manage constraints

14. In applying its perfect competition standard, the Authority also appears to assume that participants, other than the South Island generators, would behave in ways not consistent with experience. In his submission, Neil Walbran queried the Authority's assumption that if the HVDC had bound, "a competitive response from North Island generators would more than likely lower prices, benefitting North Island consumers'' (Neil Walbran Consulting, 2020, p. 2). In arriving at its preliminary view, the Authority argues that "SPD will efficiently allocate capacity between generation and reserve *provided offers reflect marginal costs*" (emphasis added) (Electricity Authority, 30 June 2020, p. 59). Professor Philpott assumed that reserve was offered at zero cost (Philpott, 2020, p. 4).

15. Mr Walbran presents a brief survey of prices across the HVDC from 2010 to early 2020 (Neil Walbran Consulting, 2020, p. 4). This data shows that there have been instances of very high North Island prices when the HVDC constraint binds. Mr Walbran's quick look at the data (he describes as random samples) shows the assumption by the Authority that North Island reserve providers would offer at marginal cost—the perfect competition standard adopted by the Authority—is wrong.

16. Mr Walbran argues (rightly in my view) that offer strategies by South Island generators to prevent the constraint binding suggests:

> … there can be a lack of competitive pressure on North Island prices when the HVDC northward constraint binds. Their offer strategy is in response to these prices and provides additional competitive tension (on both spot prices and the available risk management tools).

17. The samples provided by Mr Walbran support the conclusion presented in my submission: offer strategies that prevent constraints from binding can smooth prices across regions compared to what would occur if the constraints bind; this price-smoothing effect can increase consumer surplus because consumers may benefit more from lower peak prices than they are harmed by higher prices in regions where prices would otherwise fall.

Opportunity cost is determined by choice

18. Energy Link points out an unsupported leap in the Authority's reasoning. The Authority argues that when a generator is spilling the opportunity cost of water is nil; it claims that offers should, therefore, reflect only the marginal operating costs of hydro electricity generation. However, as

[3] Transmission constraints are modelled simultaneously but by using approximations; resource consent terms may have been set many years previously and are not adjusted continuously as would be assumed under perfect competition.

Energy Link observes, in a workably competitive market, generators (as with any supplier) could be expected to price based on their assessment of their opportunity cost, and that the value of water at a given moment in time is not the only element of opportunity cost.

19. Nobel Laureate James Buchanan expresses the concept of opportunity cost as follows (Buchanan, 2008):

> Opportunity cost is the anticipated value of 'that which might be' if choice were made differently. Note that it is not the value of 'that which might have been' without the qualifying reference to choice.

20. As the quote emphasises, opportunity costs exist in the context of the decision or choice being analysed. For generators preparing offers, opportunity cost takes in all of value of that which might be if an alternative offer was made, not just what might be done with the water. As discussed above, these opportunity costs include economic costs that are determined jointly and simultaneously with prices. Opportunity cost to a generator includes the impact of a clearing offer on the market price and accordingly on revenue from inframarginal quantities. Mr Walbran and Energy Link both identify potential costs that a generator would consider as part of its opportunity cost. The Authority conflates opportunity cost of water with the opportunity cost of offers, and they are not the same in workably competitive markets.

Competition is a market design issue

21. Genesis submits that "the 2009 Ministerial Review agreed with the general view among international experts that restructuring of generation usually has the best potential to strengthen competition" (Genesis Energy Limited, 2020, para. 17). Genesis does not provide a citation for its claimed general view of international experts; the view as stated by Genesis does not accord with the published literature.

22. It is the case that competition agencies will sometimes use market concentration as an imperfect indicator when forming preliminary assessments of the strength of competition in a given market. However, such assessments are done with caution since there is an ambiguous relationship between the structure of a market and the intensity of competition within that market. The structure conduct performance hypothesis attributed to Bain (1951) has long since been successfully challenged by Baumol's (1982) contestability theory, Sutton's (1991) work on sunk costs, and Demsetz's (1973), (1974) arguments on the direction of causality.

23. The Australian Competition Tribunal in its decision to authorise AGL Energy to acquire Macquarie Generation addresses, at some length, the point that industry structure does not determine competitive pressure (Application for Authorisation of Macquarie Generation by AGL Energy Limited, 2014):

> There is nothing inherently wrong with a market in which three large firms compete vigorously for market share where there are incentives to steal customers away from rivals. It is behaviour that matters, not structure per se. It appears to the Tribunal that it has been invited to assume that the "Big 3" will not constitute a competitive market principally on the basis of their combined market share immediately post-acquisition on

> an assumption that competition between them would become muted over time. In the opinion of the Tribunal, oligopolies should not be thus prejudged.

24. McMillan (2002, pp. 74, 88) observes in his natural history of markets that competition does not just happen in markets with any degree of complexity. Creating conditions for active competition is one of the main tasks of market design. Almost all rules impact on competition in some manner because all rules affect behaviour relative to what might occur under a different rule. However, two examples might illustrate the point that competition is a market design issue, not a structural issue.

25. When the New Zealand wholesale electricity market was introduced in 1996, almost any kind of offer mechanism was likely to work better than the centralised monopoly control of generation that preceded the wholesale market. But as the voluminous literature on auction theory attests, some kinds of auctions work better than others in delivering long-term benefits to consumers. Since 1996, there has been a global natural experiment in wholesale electricity market design—the Association of Power Exchanges lists members from over 30 countries.[4] There has also been a burgeoning of electronic auctions as markets have been created in front of us as entrepreneurs devised new ways of transacting—TradeMe, for instance, was founded three years after the wholesale market began trading. Trading platforms have advanced substantially; in 1996, the wholesale electricity market operator, M-co, imported specially the largest desktop computer available short of a mainframe to operate the pricing software; now that software operates on a laptop.

26. Yet, despite all of this learning and technological development, the core offer rules in the wholesale market are largely unchanged from those designed in 1996. It could be that rules designed in a different era (at least in terms of information technology) remain state of the art; more likely, opportunities to enhance the market design to promote competition for the long-term benefit of consumers have not been picked up, perhaps as regulators addressed other priorities.

27. The second example, illustrating the point that competition is a market design issue, is that the surest route to enhanced competition is the arrival of new firms. Barriers to entry to the wholesale electricity market are primarily a market design issue, as the Code specifies the entry requirements. A current example is that the Authority was convinced soon after its formation in 2010 that the existing transmission pricing methodology "acts like a tax on generation in the South Island" (Electricity Authority, 10 June 2020). The Authority has recently decided to reduce this barrier to entry, but will still take several years to effect that decision (Electricity Authority, 10 June 2020).

Conclusion

28. The requirements and incentives created by the market rules are as inherently an element of the underlying supply and demand conditions as the incentives created by changes in fuel supplies,

[4] The Association's website advises that it was formed to facilitate development and communication of ideas and practices in the operation of global competitive electricity markets: https://theapex.org/

when assessing whether normal trading was disrupted by an unforeseen or rare event; that is, when assessing whether a UTS arose.

29. However, in its test, the Authority sought to compare observed outcomes with the outcomes it might expect had South Island generators offered in a manner consistent with perfect competition. Such a test cannot distinguish whether the observed outcomes result from a disruption to normal trading, from market design characteristics, or are the expected results of the existing market rules.

30. None of the submissions provide evidence or analysis to disturb my conclusion—in my submission on the Authority's preliminary decision—that normal market operations continued without interruption during the period investigated, and therefore that no UTS arose.

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