Submission to the Electricity Authority

on

Transmission Pricing Methodology: Sunk Costs

Made on behalf of 20 Electricity Distribution Businesses

PwC Submission on behalf of 20 EDBs

19 November 2013

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Glossary

CBA	Cost Benefit Analysis
IPP	Transpower Individual Price-Quality Path under Part 4 of the Commerce Act 1986
EA	Electricity Authority
EDB	Electricity Distribution Business
Grid	Transpower's national transmission grid
GXP	Grid Exit Point
LRIC	Long run incremental cost
Part 4	Regulation under Part 4 of the Commerce Act 1986
RCPD	Regional Coincident Peak Demand, basis for charging for interconnection under the current TPM
RCPI	Regional Coincident Peak Injection charge. A new charge based on injection into the Grid as proposed in the October Issues Paper.
SPD	Scheduling, Pricing and Dispatch charge. A new charge based on wholesale market pricing as proposed in the October Issues Paper.
TPM	Transmission Pricing Methodology
UNI	Upper North Island region, used for interconnection charge pricing
USI	Upper South Island region, used for interconnection charge pricing

Submission on Transmission Pricing Methodology: Sunk Costs

1. This paper forms our submission on the Electricity Authority's (EA) working paper, "Transmission Pricing Methodology: Sunk Costs" released on 8 October 2013 (the working paper). This submission has been prepared by PricewaterhouseCoopers (PwC) on behalf of the following 20 Electricity Distribution Businesses (EDBs or distributors):

    - Alpine Energy Limited
    - Aurora Energy Limited
    - Buller Electricity Limited
    - Eastland Network Limited
    - Electra Limited
    - EA Networks Limited
    - Electricity Invercargill Limited
    - Horizon Energy Distribution Limited
    - MainPower New Zealand Limited
    - Marlborough Lines Limited
    - Nelson Electricity Limited
    - Network Tasman Limited
    - Network Waitaki Limited
    - Northpower Limited
    - OtagoNet Joint Venture
    - The Lines Company Limited
    - The Power Company Limited
    - Top Energy Limited
    - Waipa Networks Limited
    - Westpower Limited.

2. These businesses together supply 28% of electricity consumers, maintain 45% of total distribution network length and service 72% of the total network supply area in New Zealand. They include both consumer owned and non consumer owned businesses, and urban and rural networks located in both the North and South Islands. In the year to March 2012 these distributors paid over $140m in transmission charges, nearly 20 per cent of Transpower's 2012 transmission revenue.

3. In October 2012 the EA consulted on a proposal for a new Transmission Pricing Methodology (TPM), set out in its consultation paper, "Transmission Pricing Methodology: issues and proposal" (the October Issues Paper).

4. In response to feedback received on the proposal, the EA decided to develop a second Issues Paper that may modify the original TPM proposal. As an initial step in this revised work stream, the EA wish to respond to substantive issues raised in submissions on the original proposal. In particular, several submitters raised concerns that the proposed TPM would change the way sunk costs are charged for and in doing so would give rise to economic inefficiencies. In response to these concerns the EA has reviewed the definition of sunk costs in economic theory and has considered the relevance of sunk costs to efficient production and pricing decisions.

5. Based on a review of economic literature, the EA makes the following observations and conclusions in regards to sunk costs:

    - expenditure which has been irrevocably committed is sunk; if there is no alternative use for an asset, and no demand for the asset in its current use, the costs committed to that asset are sunk under all definitions of a sunk cost (para 9.2).
    - All sunk costs are fixed, but not all fixed costs are sunk (para 9.2).
    - A supplier should ignore the cost of a sunk asset in deciding whether to continue to produce a service. As long as the revenue received for the service exceeds the non-sunk costs of producing the service, the firm is better off continuing to supply the product (para 9.3).
    - Categorising costs as sunk or otherwise has few if any implications for efficient pricing. The important distinction for static efficiency considerations is between variable and fixed costs (para 9.6).
    - The debate in economic literature on efficient pricing is about how best to recover fixed costs (and sunk costs are fixed costs), and not whether a distinction is required between sunk and other costs (para 7.18).
    - Prices should recover the full economic cost of the service provision (para 7.16). Price discrimination is one way to achieve this (para 7.10).
    - Economic theory does not support the claims in submissions that 'there can be no dynamic efficiency benefits' from adjusting prices to incorporate the cost of sunk assets or that recovering fixed costs through variable non-marginal prices would necessarily be allocatively inefficient (para 9.7).
    - In meeting the EA's statutory objective, if changing the methodology by which transmission prices are determined promotes overall efficiency in the electricity industry, the EA may change the methodology, irrespective of the existence of sunk costs (para 9.8).

6. Set out in this submission is our response to these observations and conclusions. In particular, we discuss the practical application of these concepts to Transpower.

7. We also note and support the ENA's submission[1] on the working paper, including the following points:

    - It is not clear what implications or criteria the EA intends to draw from the above conclusions for developing its TPM proposal (para 3).
    - The working paper does not make a link between marginal pricing criteria, infra-marginal pricing criteria, and how best to assess the efficiency properties of the various pricing components of the proposed TPM (para 7).
    - It is not clear why the working paper focuses so heavily on distinguishing sunk and fixed cost, given the conclusion that the important distinction is between fixed and variable costs (para 3).
    - There is little empirical evidence in the working paper to test whether Transpower's costs are sunk or not apart from with reference to high level theory (para 6).

[1] ENA, Comment on the Electricity Authority's Sunk Costs Working Paper, 19 November 2013

Sunk Cost definition

8. The parties represented by this submission agree with the propositions that:

    - costs are sunk where they are irrevocably committed to with no alternative use
    - the key feature of a fixed cost is that it does not vary by unit of production
    - sunk costs are a fixed cost that has no economically-viable alternative-use.

9. Based on these definitions, we consider that significant components of Transpower's grid costs are likely to be both fixed and sunk, given that:

    - The cost of using the existing grid assets does vary by unit of capacity used (at least in the short term)
    - Transpower has irrevocably committed to this expenditure
    - there is no economically-viable alternative use for the grid assets other than in providing transmission services.

10. With respect to the final point, sunk costs are also likely to arise where the cost of transferring assets to their alternative use is prohibitively high. It is therefore important to focus on economically viable alternative uses. For example, certain components of a transmission circuit may have alternative uses in a distribution or generation business. However, the costs associated with redeployment may exceed the cost of installing the equipment.

Sunk cost of investments vs assets

11. The working paper also discusses sunk costs from an investor's perspective. It concludes that an asset is not sunk where it can be sold to another investor in its current use[2]. Practically, Transpower's assets could be sold by the Crown, so we agree that an opportunity cost exists for investment in Transpower.

12. However, this discussion is somewhat unhelpful in the context of the TPM as it confuses the opportunity cost of an investment in the equity of Transpower from the opportunity cost of the asset itself. Regardless of who owns the equity in Transpower, the transmission network still predominantly represents an irrevocably committed cost with little alternative use. We suggest that the focus of the discussion on sunk costs should therefore be on transmission assets, not equity within the company that owns those assets.

Regulatory rights

13. Section 8 of the working paper notes that the IPP permits Transpower to recover the full cost of service provision once expenditure is approved by the Commerce Commission (Commission). The regulatory framework is therefore assumed to confer a right to recover total economic costs. From Transpower's perspective, the working paper concludes that:

    > *"all costs in providing transmission services can be recovered, hence the regulatory right would seem to ensure that expenditure by Transpower on long-lived assets take the economic characteristics of fixed costs rather than sunk costs" (para 8.13).*

14. We disagree with this conclusion. Costs are sunk when opportunity cost is foregone. A 'regulatory right' to recover these costs does not mean that transmission assets have an alternative use. It merely secures the opportunity for the investor to recover prudent and efficient costs and to earn a return

[2] Working paper, Para 5.7-5.11

commensurate with the Commission's view on the cost of capital. The transmission assets still have little alternative use.

Variable charges

15. In section 7 the EA responds to several concerns raised in submissions with regards to variabilising fixed costs under the previous TPM proposal[3]. From our reading of submissions, the debate seems to relate to the proposed SPD charges use of half hour trading periods and whether a RCPI charge or MWh charge was preferred in relation to the residual charge. Accordingly, the issue is quite specific to the original TPM proposal and not generic to a discussion of whether variable charges can be used to price fixed costs.

16. Nevertheless, we consider it is useful to take a long term view of network investments when considering variable charging of fixed network costs. While existing network costs are fixed, in the long run all costs are variable. A variable charge may introduce revenue uncertainty when used to recover fixed costs, but it can also promote dynamic efficiency by signalling the long run incremental cost (LRIC) of future investments in additional network capacity. These two competing objectives need to be balanced in pricing decisions.

17. The interconnection charge under the current TPM is a good example of a variable charge that signals LRIC, yet avoids revenue uncertainty. It is levied on prior year regional coincident peak demand (RCPD), which avoids revenue uncertainty, but signals the use of limited capacity in the existing network as well as the LRIC of future capacity upgrades.

Efficiency gains from changes to the TPM

18. The working paper disagrees with submissions that changes to the TPM which alter prices for existing sunk investments will not impact dynamic efficiency. It concludes that:

> *"A pricing methodology that alters infra-marginal prices (that is, any price other than for the marginal unit) for services provided using existing (including sunk) investments may enhance dynamic efficiency and be consistent with the conditions for static efficiency." (para 7.19)*

19. We do not disagree that changes to the TPM may promote efficiency gains. However, we consider the quantum of these efficiency gains is likely to be low for Transpower, in part because of the presence of sunk costs. We expand on this view, below. However, we stress the importance of a robust CBA which can provide empirical evidence in support of any efficiency gain arguments.

Dynamic efficiency

20. Alternative TPM proposals may exist which may better promote dynamic efficiency relative to the current TPM. However, from our perspective, dynamic efficiency gains arising from TPM change are likely to be limited to future investment decisions and short run variable costs. We therefore agree with CEG, that changes to the TPM will have little impact upon the efficiency of *past* grid investments as these are largely sunk[4]. Importantly, as the literature points out, these costs are irrevocably committed to and have no alternative use so Transpower cannot change the efficiency of these investment decisions by changing its pricing methodology.

21. The TPM can potentially influence the efficiency and timing of short run variable costs associated with existing assets (eg operations, maintenance, renewals and refurbishment expenditure) through marginal cost pricing. However, many of these costs are likely to be irrevocably committed to alongside the initial sunk investment. That is, it would be rational economic behaviour to maintain and refurbish a sunk asset once it is committed to, so long as the long-term cost (excluding sunk costs) are less than

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[3] For example, Vector, page 244-245 of the TPM Conference Transcripts

[4] Competition Economists Group, paragraphs 7 & 8.

that of investing in new assets[5]. This reduces the potential benefits that could be gained through more efficient management of variable costs.

22. TPM changes which focus on improving *future* investment decisions are likely to be more effective at promoting dynamic efficiency. However, as this group and others have previously submitted, the dynamic efficiency benefits that could be realised from TPM changes are likely to be limited for the following reasons:

    - The current interconnection charge already promotes dynamic efficiency and is effective in signalling future investment costs in core grid capacity. Interconnection charges signal limited service capacity in the core grid and that higher peak-time usage puts pressure on future network investments. Furthermore, the Upper North Island (UNI) and Upper South Island (USI) regions use the top 12 peaks to signal network constraints. This pricing structure has proven reasonably effective. For instance, as noted in our previous submission on the October Issues Paper, distributors shed nearly 5 per cent of their 2012 peak load at GXP peaks partly in response to this price signal. Any dynamic efficiency benefits arising from change to the TPM are therefore likely to be incremental, perhaps resulting from more targeted pricing structures.

    - The impact of any revision to the TPM on investment decisions will take some time to work through given the long life of transmission and associated (ie distribution and generation) investments. It may be decades before dynamic efficiency benefits are realised. The present value of efficiency benefits is likely to be heavily discounted (as we believe the CBA may reveal).

    - The efficiency benefits related to future investments resulting from TPM change are likely to be negligible given all major investments are approved by the Commission and are recoverable through Transpower's regulated price cap[6]. There is no ex-post penalty on Transpower for making poor investment decisions, regardless of the form of prices, as Transpower will recover its investment.

Productive efficiency

23. The working paper asserts in section 6 that sunk costs should not be taken into account in production decisions. An example is given in regards to R&D costs[7]. In this example, it is proposed that a firm is better off selling a product even if the revenue does not cover the sunk cost of R&D associated with the development of the product. By inference, TPM pricing can ignore the sunk cost of the network in order to promote productive efficiency.

24. Productive efficiency is often defined as the production of a given output for the lowest input cost possible, or alternatively the highest output for a given set of input costs. Productive efficiency is promoted where prices are set with reference to marginal costs (ie excluding fixed costs).

25. Pricing discrimination concepts, such as Ramsey pricing, provides theoretical guidance on how pricing can promote productive and allocative efficiency through setting prices with reference to consumer willingness to pay[8]. Under Ramsey pricing, prices are set with reference to marginal costs and marked up in proportion to a consumer's relative willingness to pay (up to a consumer's stand alone cost) in order to recover total economic costs. Consumers that have a higher willingness to pay will pay a relatively higher price and therefore contribute more towards recovery of total costs (and *vice versa*).

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[5] Holding quality of supply considerations fixed.

[6] Under Transpower's Individual Price Path (IPP) determined under Part 4 of the Commerce Act 1986

[7] Working paper, Para 6.2

[8] As discussed in paragraph 7.10 of the working paper

26. Pricing in this way increases output and reduces average cost to serve as prices satisfy individual consumer demands and willingness to pay. It is also consistent with the economic literature as prices are set with reference to marginal costs, although with the intention of recovering total economic costs.

27. In practice, we consider the productive efficiency gains arising from moving to more efficient pricing methodologies, such as Ramsey Pricing, are likely to be negligible for Transpower. This is because Transpower's inputs and outputs of production are relatively fixed (at least in the short term without invoking dynamic efficiency arguments). That is, a change to prices or pricing structures is unlikely to affect Transpower's:

    - inputs costs (including grid and non-grid related costs of service), given these are predominantly fixed and are recovered through a regulatory right to recovery of approved costs under Part 4 regulation. Even its variable costs (ie overheads, maintenance, operations), upon which marginal cost pricing would be based, are unlikely to vary by unit of production (ie capacity). For example, personnel and support costs do not vary by network demand.

    - productive output (ie MW demand). This is largely determined by electricity demand which is relatively demand inelastic in the short term (ie relatively non-responsive to changes in price). A change in pricing structures is therefore likely to have a relatively small impact on output.

28. While the presence of high fixed costs (which are mostly sunk) do not rule out productive efficiency gains, as the working paper suggests, they will reduce the potential productive efficiency gains that can be achieved. This is because Transpower's cost inputs do not vary by output and production outputs are relative inelastic.

Allocative efficiency

29. Allocative efficiency is concerned with the optimal allocation of resources to society. The EA's review of the literature concludes that recovering sunk costs based on the marginal cost (of non-fixed costs) is efficient (both dynamic and static). As with productive efficiency, allocative efficiency is only achieved in the context of a natural monopoly where total economic costs are recovered through use of price discrimination based on consumer willingness to pay (eg Ramsey pricing). Similarly, allocative efficiency gains are also likely to be limited by the large proportion of fixed costs and an inelastic demand curve for electricity.

30. We believe a leap in logic is made, however, in concluding that TPM change necessarily promotes the overall efficiency of the sector. The economic theory quoted by the EA discusses efficient pricing in the context of a firm not the wider sector in which a firm operates, particularly where that firm comprises one part of the overall value chain. While allocatively efficient transmission pricing may have spill over benefits to other parts of the value chain, through the efficient allocation of resources, we submit that the EA should be cautious about extending the economic theory of efficient pricing of one product (ie transmission) to target efficiencies in other parts of the value chain (wholesale and retail markets). For instance, we note that our submission on the October Issues Paper expressed concern that introducing transmission pricing decisions into otherwise efficient wholesale market pricing decisions could actually distort the wholesale market[9].

[9] PwC submission on behalf of group of 22 EDBs on the October Issues Paper (1 March 2013), Para 21-23

Meeting the EA's statutory objective

31. The working paper concludes by stating that:

> *"if changing the methodology by which transmission prices are determined promotes overall efficiency in the electricity industry, the [EA] may change the methodology, irrespective of the existence of sunk costs." (para 9.8)*

32. The EA's statutory objective is:

> *"To promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers"*[10]

33. In principle, we do not disagree with this statement subject to the following caveats:

- Efficiency gains would need to be robustly estimated based on CBA, assessed against a range of potential TPM options and scenarios, which shows a clear and material benefit arising from change.[11]
- The TPM should primarily seek efficiency gains in transmission. The TPM should not be used as a tool to achieve policy objectives in other parts of the value chain, although these may result as spill-over benefits from efficient transmission pricing.
- Consistent with the EA's interpretation of its statutory objective, the sharing of efficiency gains with consumers and suppliers in non-competitive markets (ie in transmission and distribution) needs to be balanced with preserving incentives for investment and innovation in these markets.[12]
- Individual welfare effects on different stakeholders need to be estimated and ideally mitigated to avoid one off wealth transfers.

34. With regards to the later caveat, we consider that pareto efficiency should also be taken into account by the EA in assessing TPM proposals, as part of the efficiency limb of its statutory objective. In its ideal condition, pareto efficiency is promoted where all stakeholders are made better off without making anyone worse off. While it may not always be possible to achieve a pareto efficient outcome, understanding the impact of TPM change on individual stakeholders as well as potential wealth transfers that result is crucial to understanding pareto efficiency.

Next Steps

35. We trust this submission provides useful input for the EA in reviewing the TPM. We would be happy to answer any questions you may have regarding this paper.

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[10] Section 15 of the Electricity Industry Act 2010

[11] As discussed in the TPM: CBA working paper.

[12] EA, Consultation Paper, "Interpretation of the Authority's Statutory Function", 8 November 2010, Paragraph A41,