

# Decision-making and economic framework for transmission pricing methodology review

Summary paper

3 February 2012

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## Introduction and purpose of this paper

The Electricity Authority (Authority) has published a consultation paper on the decision-making and economic framework that it will use to make decisions on arrangements that are used to determine the prices and the parties that are charged for transmission network services.<sup>1</sup> This summary paper is intended as a 'layperson's' guide to the Authority's 'Decision-making and economic framework for the transmission pricing methodology review' Consultation Paper.

Parties wanting to make submissions are requested to do so in regard to the Consultation Paper, as this summary paper provides only a broad overview of the issues.

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## Transmission network services and pricing

The transmission network is used to transport electricity over long distances from generators to large industrial power consumers and local distribution networks. The local distribution networks then transport electricity to smaller businesses and households. The transmission network comprises high-voltage lines, towers, transformers and related infrastructure, and includes the High Voltage Direct Current (HVDC) link between the North and South Islands.

Transpower owns and operates most of the transmission network. The total revenue that Transpower can collect through transmission charges is regulated by the Commerce Commission, which also approves new transmission investment.

Annual transmission costs are currently about \$700 million per year, and are forecast to increase to over \$1 billion a year over the next ten years to recover the costs of a large programme of new transmission investment.

Although the Commerce Commission determines total revenues, the Authority provides guidelines to Transpower on how it should apportion its revenue requirement among its customers. Based on those guidelines, Transpower proposes the precise method for charging its customers, called the transmission pricing methodology (TPM), and the Authority approves the final TPM.

The TPM is provided in Schedule 12.4 of the Electricity Industry Participation Code 2010 (Code). The current TPM establishes the following transmission charges:

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<sup>1</sup> <http://www.ea.govt.nz/document/15896/download/our-work/consultations/transmission/tpm-economic-framework/>

- a *connection charge* that covers the costs of assets connecting a participant to the grid. Distributors, generators and large consumers connected directly to the grid pay these charges;
- an *interconnection charge* to cover the cost of the rest of the transmission system except the HVDC link. These charges are paid by large consumers who connect directly to the grid and by local distributors; and
- an *HVDC charge* that covers the cost of the HVDC link between the North and South Islands. These charges are met by South Island generators.

As well as establishing how transmission charges are determined, the current TPM includes the Prudent Discount Policy which helps ensure that the TPM provides incentives for the efficient use of existing transmission assets, and does not result in participants inefficiently avoiding connecting to the transmission network.

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## Issues with pricing transmission services

In standard markets, producers pay the costs of transporting their goods to market, and consumers pay to transport their purchases from the point of sale to their location. The standard outcome, in workably competitive transport markets such as road transport, is that the price paid by the customer for the goods includes the cost of transport of those goods to market.

However, it is not always straightforward to identify the transmission-related costs of the electricity used by any individual customer, or to apportion those costs to any individual customer. For example, the cost of the connection assets used by a generator to supply electricity into the interconnected network can be attributed to that generator, but it is difficult to apportion the cost of the interconnection assets (e.g. the poles and wires) used to transport electricity to any individual customer because electricity flows over multiple paths and the flows vary depending on the behaviour of different market participants.

Having arrangements that achieve an efficient allocation of transmission costs, and lead to efficient transmission prices, will have power system and economy-wide benefits. In particular, the level and structure of transmission charges will influence overall power system efficiency by affecting decisions about the operation of, and investment in, the transmission network, generation, and demand-side management.

The current TPM has been in place since 2008, but is largely based on the TPM that was developed by Transpower in the late 1990s. Any changes in the TPM could lead to re-allocation of transmission costs among participants. A particular point of contention is the allocation of the HVDC charge.

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## Decision-making and economic framework

The Authority inherited the TPM review from the Electricity Commission (Commission) when it succeeded the Commission in November 2010. The Authority established the Transmission Pricing Advisory Group (TPAG), consisting of electricity industry participants and consumers, to provide advice and recommendations on a preferred option for transmission pricing. TPAG was unable to reach a consensus and make a recommendation on key aspects of transmission pricing.

In the Authority's view, while TPAG advanced the analysis of the TPM considerably, it did not provide a comprehensive and durable framework for making decisions about the TPM.

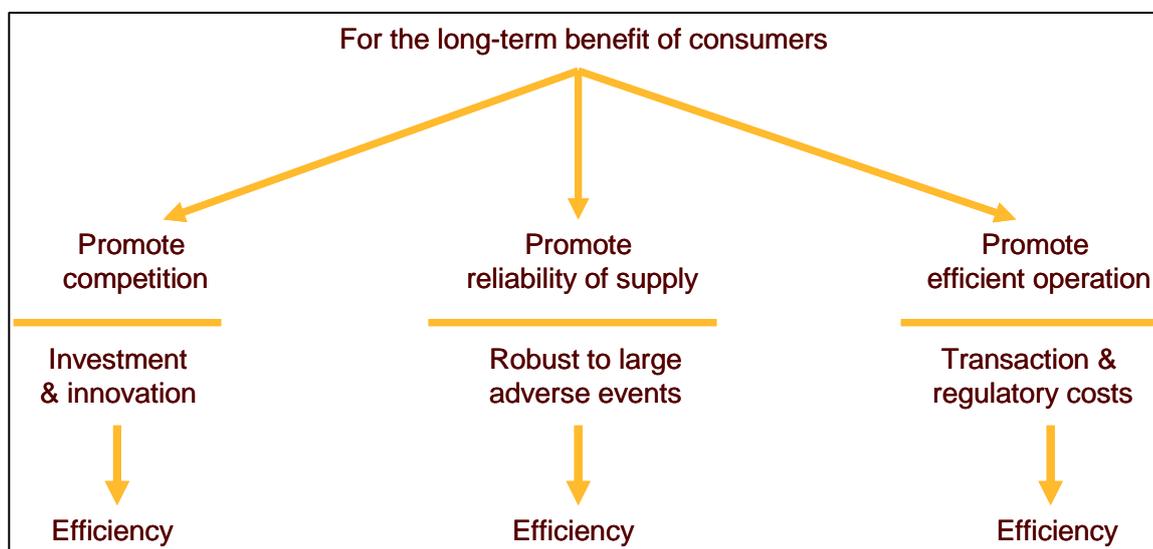
The Consultation Paper describes how the Authority proposes to make decisions on the TPM, and the economic basis for its decisions.

The Authority's focus is ensuring the TPM is consistent with its statutory objective, which is:

“to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.”<sup>2</sup>

Ultimately, the competition, reliability and efficiency limbs of the Authority’s statutory objective are about the promotion of efficiency as the means to increase long-term benefits to consumers. Competition is an important tool to encourage efficient outcomes and measures directed at altering reliability outcomes should encourage efficient trade-offs between the costs and benefits of reliability. The relationship between the competition, reliable supply and efficient operation aspects of the statutory objective and efficiency is described in Figure 1.

**Figure 1 Summary of interpretation of statutory objective**



Source: Electricity Authority

Consistent with the Authority’s interpretation of its statutory objective, decision-making for the TPM should focus on overall efficiency of the electricity industry for the long term benefit of electricity consumers.

Overall efficiency, in relation to transmission pricing, refers to both:

- (a) efficient use of the grid, which focuses on least cost production and charging customers the efficient marginal costs<sup>3</sup> of production; and
- (b) efficient investment, which focuses on the lowest cost development of the industry over time, including investment in the grid, generation, and by consumers to manage their electricity use.

These two aspects of overall efficiency can be conflicting. For the existing grid, increased use involves little extra cost and charges should be structured to avoid discouraging or altering use of the network up to its capacity. Where additional use requires investment in the grid, increased use involves much higher costs. Trade-offs can also be made between transmission investment and alternatives such as generation and initiatives by consumers that limit their peak electricity demand. In this case, it may be necessary to design charges to directly influence use of the network.

The consultation paper proposes a decision-making and economic framework the Authority considers should underpin its transmission pricing decisions. This framework steps through a hierarchy of approaches that can be applied to transmission pricing.

<sup>2</sup> Electricity Industry Act 2010, section 15.

<sup>3</sup> In economics, marginal cost is the change in total cost of producing a good or service when the quantity produced changes by one unit.

The Authority's preliminary view is that its first preference is for market-based approaches to determining transmission charges. Where this is not effective for some parts of the network or services, for example where there are market power issues, the Authority would then look to administrative approaches.

Whichever approach is selected it must be consistent with the Authority's statutory objective. Further, any proposal to amend the TPM would need to comply with the Authority's Code amendment principles (which provide guidance on the basis on which the Authority will amend the Code).

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## **Market-based charges**

A market-based approach would involve charges negotiated by buyers and sellers in a workably competitive market or the imposition of charges which are likely to mimic or replicate such charges. The Authority's preliminary view is that it would prefer charges that are negotiated by buyers and sellers rather than charges that seek to replicate the outcome of market interactions.

A market-based approach based on long-term contracting has been adopted in New Zealand for charging for connection assets.

A market-based transmission charge was proposed by the Transport Working Group (TWG) of the Electricity Governance Establishment Committee (EGEC) in 2001-02 as part of a grid and transmission alternatives investment framework. This charge involved payments for all upgraded grid assets – connection, interconnection and HVDC assets – on a long-term contractual basis.

The other main market-based charge, which was considered by both the Commission and the TPAG, is capacity rights, particularly for the HVDC link. Capacity rights, which would be auctioned by the transmission provider, are tradable mechanisms that give generators that hold them the right to have their generation dispatched to supply power to the electricity market.

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## **Administrative approaches to charging**

If an administrative approach to setting transmission charges is required, the Authority's preliminary order of preference among administrated approaches is:

- (a) exacerbators pay, where an 'exacerbator' is defined as a party whose action (or inaction) led to the cost in question;
- (b) beneficiaries pay, where a 'beneficiary' is defined as a party for whom the private benefits of the investment exceed the cost and would therefore be willing to pay for it; and, finally
- (c) alternative charging options, such as adopting 'postage stamp' pricing where costs are apportioned equally across all users.

Making exacerbators face the full costs of their decisions, including the impact of their actions on the cost of transmission, should improve the performance of the economy as a whole by reducing wasteful activities.

Charging beneficiaries, however, only ensures that those who would be willing to pay are required to do so.

Applying these approaches requires a robust method for identifying exacerbators and beneficiaries that can be applied consistently across the grid and over time. The benefits of these approaches will be compromised if exacerbators and beneficiaries cannot be cost-effectively and clearly identified.

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## Exacerbators pay

To ensure exacerbators have incentives to make efficient decisions, the price they face should be the price that most accurately reflects the costs their actions (or inactions) incur. The consultation paper suggests that prices could reflect the minimum increase in total cost associated with an increase of one unit of output when all inputs are variable; or that prices could reflect the additional cost of augmenting the network, over and above that already planned.

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## Beneficiaries pay

If beneficiaries pay for investments, this should lead to improved investment decisions and more durable outcomes because parties using certain transmission assets should be willing to pay up to the private value they obtain from those assets.

Ideally, the price that should apply to beneficiaries should reflect the lesser of the charge which will fully recover the costs of the grid being paid by beneficiaries and the anticipated value to them from the services provided by the grid. Cost allocation to beneficiaries should be fixed at a point in time, as this avoids the problem of the method of cost allocation influencing their use of the asset.

Determining the extent to which a party benefits from the grid involves understanding the costs of any alternatives available because the benefit cannot exceed the cost of its next best alternative. Charging a beneficiary more than it is willing to pay may provide incentives for parties to disconnect from the grid, which may be inefficient.

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## Alternative charging options

If it is not possible to achieve a market-based charging method or charging based on exacerbators or beneficiaries pay, an alternative charging option should be considered. Any such option would need to:

- (a) limit any incentives to avoid using the grid as a result of the imposition of charges; and
- (b) ensure the costs of providing the grid are fully covered, so future investment in the grid is not inhibited by investors in the grid fearing they will not receive a return on their capital.

Approaches that would meet these requirements include:

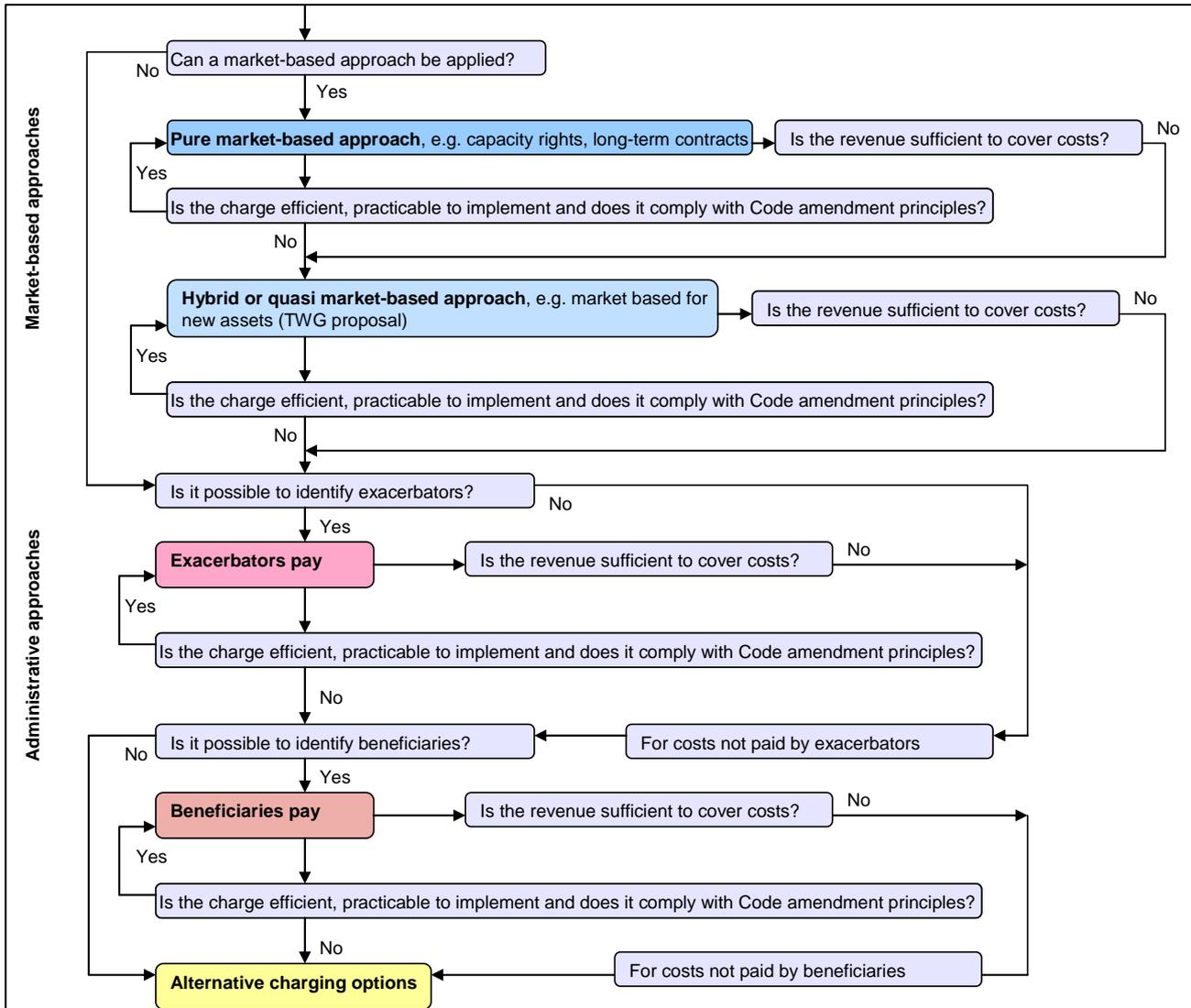
- (a) setting the charges so that costs are fully covered, but levying the charges on a basis unrelated to the current level of usage of the grid; and
- (b) setting the charges so that costs are fully covered, but spread out evenly across as broad a base as possible, so the charge per unit is low. This is referred to as a 'postage-stamp' approach. This is because the charge is the same for all parties paying the charge, just as the cost of posting a standard letter within New Zealand is the same regardless of its origin or destination.

The interconnection charge in the current TPM is an example of this kind of charge. It is applied on a uniform postage-stamp rate to all off-take customers on the basis of their share of demand at times when total demand in a region is at its peak (called regional coincident peak demand).

## Summary of Authority's preliminary view

The flowchart set out in Figure 2 outlines the Authority's preliminary view of the decision-making process.

**Figure 2 Preliminary view of decision-making and economic framework for transmission pricing**



Source: Electricity Authority