11 Chews Lane
PO Box 10568
The Terrace
Wellington 6143
New Zealand

Genesis Power Limited
trading as Genesis Energy

Fax: 04 495 6363

28 March 2013

Carl Hansen
Chief Executive
Electricity Authority
2 Hunter Street
WELLINGTON

By email: submissions@ea.govt.nz

Dear Carl

Cross submissions on Proposed TPM issues and guidance paper

Genesis Power Limited, trading as Genesis Energy, welcomes the opportunity to provide a cross-submission to the Electricity Authority ("the Authority") on the consultation paper "Transmission Pricing Methodology: issues and proposal" dated 10 October 2012 ("the Proposed TPM").

It is clear that across the broad range of submitters that there is a significant level of discomfort with the Proposed TPM. In our view, these responses need to form the foundation by which the Authority sensibly moves this process forward. In particular, we encourage the Authority to take a measured approach that results in working proactively with participants to further develop TPM options that are both practically implementable and minimize negative impact on end users.

Context: submitter views on the Proposed TPM

There a number of key themes that appear in the 54 submissions that the Authority received on the TPM proposal. We suggest that these key themes can usefully guide both the Authority and stakeholders in developing a future TPM that appropriately addresses the scale of any problems with the current TPM, whilst offering improvements to how future asset investment decisions are made.

We consider that it is important for the Authority to take stock of the industry views on the proposal before considering the next steps in the process. The following diagram illustrates our analysis of the 54 submissions:

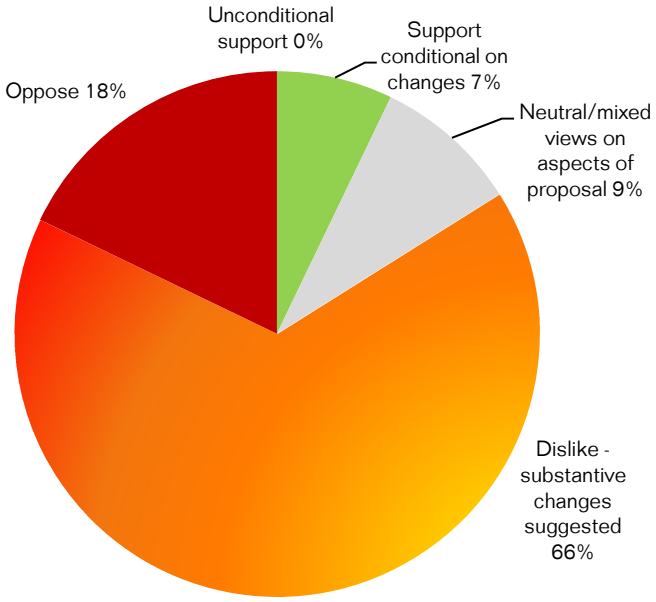


Figure CS1: Review of submitter positions

Our review shows that the majority of submitters consider the Proposed TPM either fundamentally flawed, and/or needing substantive changes for it to be implemented without significant adverse effects on the wholesale and retail markets. Although at first this level of dissatisfaction appears insurmountable, we suggest that the Authority's ability to address the key themes contained in the submissions would provide the basis for a logical, stable outcome.

Key theme: Problem definition is inaccurate

In general submitters identified that the scale of the problem is not commensurate with the proposed solution in the Proposed TPM. Although it is Genesis Energy's understanding that the Authority was attempting to 'solve' the TPM in a single solution, the potential negative outcomes for consumers and exponential increase in complexity would negate any benefit.

The increase in complexity is driven by the introduction in the proposed mechanism of significant changes to all aspects of transmission pricing. Although submitters acknowledge legacy issues with the allocation of HVDC costs, the majority consider that most aspects of the current TPM are working well.

> "We do not accept that problems with the current TPM for allocating sunk costs are material enough to justify significant changes" – Major Electricity Users Group

In particular, there is a strong view that the current AC interconnection charge remains an effective mechanism for distributing sunk asset costs:

> "The most economic IC charge would be one that achieves non distortionary recovery of sunk costs and also signals the long run marginal cost (LRMC) of new investment where demand is increasing. A postage stamp IC charge of the sort currently applied comes as close as possible to achieving the non-distortionary sunk cost recovery objective and the regional coincident peak demand (RCPD) allocation method moves some way towards signaling the LRMC of new investment in the Upper North and Upper South regions, albeit imperfectly." – PowerCo

The Authority is, of course, entitled to seek efficiency improvements even where there is relative comfort with the current status quo. In this regard, it is worth noting that most submitters agree that there is room for improving some aspects of the status quo – for example, the current allocation of HVDC costs and the suggested KVAR charge. However, in such cases, it is even more important that the Authority puts forward strong evidence that the changes will equate to net efficiency gains. In the case of the Proposed TPM, it is clear that there is no confidence that the Authority's underdeveloped cost benefit analysis provides any evidence that the proposed TPM will bring net benefits.

Other key themes from submission

In addition there is substantive agreement across submitters that:

- **The Proposed TPM is too volatile.** The transmission costs under the Proposed TPM would be too volatile for both consumers and generators. Submitters agree that this volatility would introduce unnecessary cost into the market and affect small retailers, consumers, and generators, for little or no apparent benefit.

- **The Proposed TPM is too complex.** The Proposed TPM is overly complex, given the scale of the actual problem faced under the current TPM. As well as leading to increased costs to manage this complexity, this added complexity also creates a barrier to entry for new transmission users.

- **Changes should be *ex ante*.** The retrospective nature of the proposed SPD charge raised significant concerns from most submitters.[1] In particular, the proposed *ex post* application of the SPD method could not capture the dynamic benefits of a beneficiary pays approach, and has considerable unforeseen consequences on participants' sunk investment decisions.

- **Concerns with the proposed changes to the interconnection charge.** Submitters were concerned that:

    - the proposed changes to the AC interconnection charge will dilute RCPD price signals. In particular, end consumers who currently actively participate in peak load management are concerned that diluting the current RCPD signal will remove any incentives they have to efficiently avoid peak use of the transmission system.[2]

    - allocating interconnection charges to generators will, at best, make transmission costs more opaque (e.g. per MWh). At worse, the allocation of interconnection charges (e.g. RCPI) will introduce additional costs into wholesale electricity pricing[3], additional costs that will eventually be borne by consumers.

There was also general agreement among submitters that the cost benefit analysis used to support the proposed TPM was inadequate. Submitters were clearly not convinced that the "top down" methodology used by the Authority provides a meaningful analysis of the likely impacts of the proposal. We note, however, that the Authority has indicated that they will reconsider the cost benefit analysis and this reconsideration is welcomed by Genesis Energy.[4]

Evaluation of alternative options

As noted in our original submission, there is a range of options available that might result in a revised TPM that provides benefits greater than the *status quo*. In evaluating options, Genesis Energy asserts that any revised proposal must

[1] Of the 22 submitters that expressed a clear view on this issue, most opposed applying beneficiary pays on an *ex post* basis to historical assets.

[2] See submissions of Auckland District Health Board, KiwiRail, and Energy for Industry

[3] Page 6, Domestic Energy Users Network Submission "DUEN considers… that [RCPD charges] should, as at present, be charged to distributors rather than generator-retailers, as the latter will rebundle them according to their own pricing strategies."

[4] Presentation by Dr Bruce Smith to Downstream 2013

address the specific themes of submitters, as outlined above. We suggest that one option that could be considered as a straw-man, is, as follows:

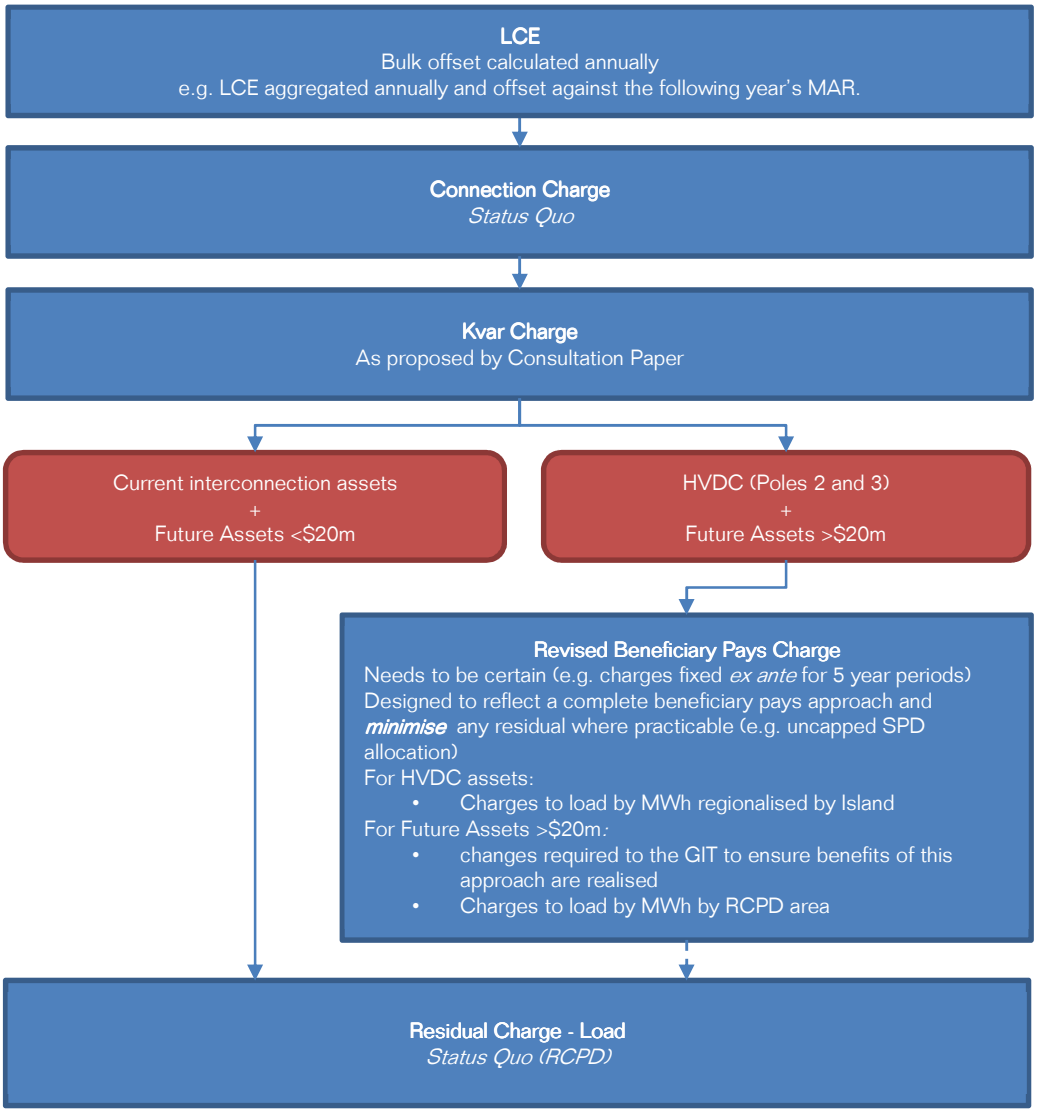


Figure CS2: Genesis Energy Straw-man

In preparing this straw-man, we considered how the various options for a revised TPM could address the themes raised by submitters:

Submission themes	Addressed in straw man
Problem definition is inaccurate	The straw-man focuses on three problems: • Contention with the allocation of HVDC costs. The straw-man uses a beneficiary pays charge to allocate these costs, reflecting the unique historical allocation of HVDC costs. • Efficiency improvements to the current TPM. The introduction of the KVAR charge, and the formalization of using LCE to offset bulk transmission costs, will both contribute small efficiency gains. • Introducing dynamic efficiency benefits to transmission pricing. A beneficiary pays for new transmission asset decisions, coupled with inclusion of this process in the GIT, is likely to provide some dynamic efficiency benefits through future investment decisions.
The Proposed TPM is too volatile	To minimize the volatility of transmission charges, the straw-man: • moderates the annual volatility of LCE by holding it over on an annual basis from year to year; • uses a beneficiary pays approach that calculates beneficiaries on a 5 year basis to provide a clear expectation to payees. Furthermore, the beneficiary pays model would be designed to minimize any impact on the interconnection pool (uncapped); and • does not include a "generator" allocation in the AC interconnection.
The Proposed TPM is too complex	Any beneficiary pays model that is not limited to a "one-time" calculation at the investment approval stage will introduce additional complexity into transmission pricing.

Submission themes	Addressed in straw man
	To avoid increasing the complexity of the TPM overall, we have suggested that the *status quo* approach remains in place for a number of methods, such as the approach to connection charges and the AC interconnection. We have also suggested improving the LCE to a 'bulk offset' approach. Amongst other benefits, this approach is simpler than offsetting against individual assets.
Changes should be *ex ante*	We suggest that a beneficiary pays approach will only realize true efficiency benefits if it is able to influence the investment decisions themselves. To this extent, we consider that creating a clear link between transmission pricing and the Commerce Commission transmission investment approval process is a minimum prerequisite for a successful beneficiary pays approach. Our suggestion is that to be properly aligned a beneficiary pays approach must: • align with the Commerce Commission threshold for new investments, that is, apply the approach to assets >$20; and • be incorporated into the GIT as a relevant consideration for the Commerce Commission when making approval decisions on new transmission investments. Ideally, to fully capture the benefits of a beneficiary pays approach, beneficiaries will need to approve proposed investments. <u>HVDC costs</u> The straw-man applies the beneficiary pays approach to HVDC costs. Including the HVDC recognizes the contentious legacy issue of who pays these costs, and overcomes efficiency problems identified by the

Submission themes	Addressed in straw man
	TPAG and the Authority. This inclusion has other potential benefits, namely reducing contention and therefore equating to a more durable TPM solution.
Concerns with the proposed changes to the interconnection charge	The straw-man retains a *status quo* approach to allocating the interconnection charge.

The straw-man suggests a bulk LCE offset against the overall transmission cost on an annual basis. To minimize volatility, these costs can be held over from year to year. This approach addresses the concern that offsetting LCE against specific assets will negate the efficient wholesale market signals.[5]

The straw-man also suggests that connection charges remain unchanged from the current *status quo*. This approach is in response to the concerns raised by Transpower, with the implications of the proposed changes on their connect customers.

Castalia analysis of possible TPM options

Our straw-man cannot, of course, address the concerns raised by those submitters who call upon the Authority to discard any changes and retain the *status quo*. However, partly to address overall concerns around the net benefits of any change, we asked Castalia to undertake a simple cost benefit analysis, adopting the framework for analysis put forward in their report on the Proposed TPM.[6] Their analysis is attached as Appendix A to this submission, and the results are shown below:

[5] Page 7, ENA Submission

[6] Appendix A to Genesis Energy submission on Proposed TPM

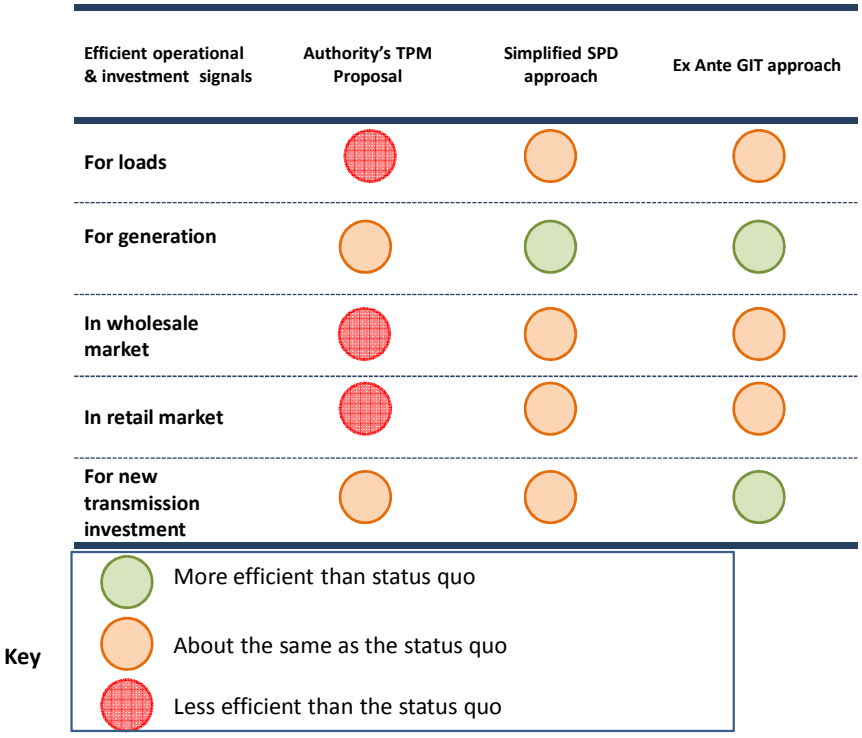


Figure CS3: Castalia CBA of potential TPM options

The Castalia analysis shows that the straw-man (described as "Simplified SPD approach") offers some efficiency improvements over the *status quo*. This is primarily because the straw-man is specifically designed to remove the inefficiencies created by the current HVDC cost allocation.

Castalia's analysis identifies significant improvements in efficiency under the straw-man, when compared to the Proposed TPM. This is because as prices would be calculated in advance and would remain fixed for a period of five years, prices are much more stable and predictable than under the Proposed TPM. This would allow parties to make operational and investment decisions on the basis of known charges, removing the prospect of distortions in the wholesale and retail electricity markets.

Castalia also examines a further "Ex ante GIT approach". The key difference between this approach and our straw-man is that the beneficiary calculation would be an integral part of the GIT approval process, and would only be undertaken once to establish cost allocations. As a result, cost allocations would not change over time, even if the identity of beneficiaries changed. This option, in Castalia's view, improves on the straw-man in terms of transmission investment decisions by providing a direct link with the transmission investment approval

process and incentivising front-end engagement in the GIT process. This approach would seem more difficult (although not impossible) for the Authority to pursue because the Commerce Commission has responsibility for the GIT process.

Process moving forward

We understand that the Authority would appreciate suggestions on the best way to move the transmission pricing review process forward.

Do not support an adversarial approach

We understand that one proposal is a "conference" or "hearing" that would enable parties to present their respective views to the Authority on the Proposed TPM. Although we agree that increased industry participation is required to progress the TPM review, we are cautious about a forum establishing a potentially adversarial approach between submitters and the Authority.

We do not consider now is the right time for the sector to enter into a potentially adversarial setting. In our view, this type of hearing process is best reserved for contentious issues on which there is clearly no sector agreement. Our review of submissions has actually shown a high level of agreement across the sector on the Proposed TPM. Therefore, we suggest it would be a better use of time if the Authority takes the opportunity to carefully consider and respond to submitter concerns.

A measured and cautious approach is needed

There is general consensus amongst submitters that the proposed TPM, and any change to transmission pricing, may have significant unintended consequences:

> "The SPD and RCPI charges have particularly high risks of unintended consequences. Our strong preference is for a stable pricing methodology over time, and for fundamental changes only to occur if there is a very compelling case that the new approach is sound and will bring significant benefits." – Transpower

We share this preference for stable pricing. Furthermore, Genesis Energy does not see any benefits from making a hasty decision on such a significant issue and is concerned with the high risk of unintended consequences from such an approach. Therefore, we encourage the Authority to take a cautious and measured approach to the TPM review.

Recommended approach: targeted workshops

We suggest that the most effective way of moving the TPM review forward will be via targeted workshops. Each workshop would focus on specific stages of the generally accepted TPM framework (e.g. market-like, exasperator pays, beneficiary pays, residual/interconnection).

In our view, a targeted workshop approach will:

- enable the sector and the Authority to discuss, and agree, on recommended options, and
- facilitate moving forward the less-contentious elements of a revised TPM to deliver efficiency benefits.

This approach will require the Authority to take additional time in the initial development of the revised TPM. In some instances multiple workshops may be required, especially on some of the more contentious stages, for all options to be properly debated and consensus reached. However, we consider this process will lead to a more robust, and ultimately more successful, revised TPM.

Effective transition period needed

We also consider that the wealth transfers inherent in any change to transmission pricing may necessitate a transition period. For example, our proposed straw-man approach would change how HVDC costs are allocated between generators and consumers. We consider that, although the overall sector impact may be small, it may still equate to a potentially significant "shock" for individual participants or consumers.

If you would like to discuss any of these matters further, please contact me on 04 495 3340.

Yours sincerely

Jeremy Stevenson-Wright
Regulatory Affairs Manager

Transmission Pricing Methodology Review

Review of TPM Options

Report to Genesis Energy

28 March 2013

Table of Contents

Figures

1 Introduction and Summary

The Electricity Authority (the Authority) has proposed major changes to the way that electricity transmission prices are determined in New Zealand. Castalia was engaged by Genesis Energy to develop a complete framework for evaluating the merits of any changes to the TPM using cost benefit analysis (CBA).

Genesis Energy has now asked Castalia to consider how various modifications to the proposed TPM would evaluate in a CBA applying our preferred analytical framework. This analysis is not a substitute for a full CBA, but rather aims to help the Authority narrow the range of options considered to those that are likely to perform well in a CBA.

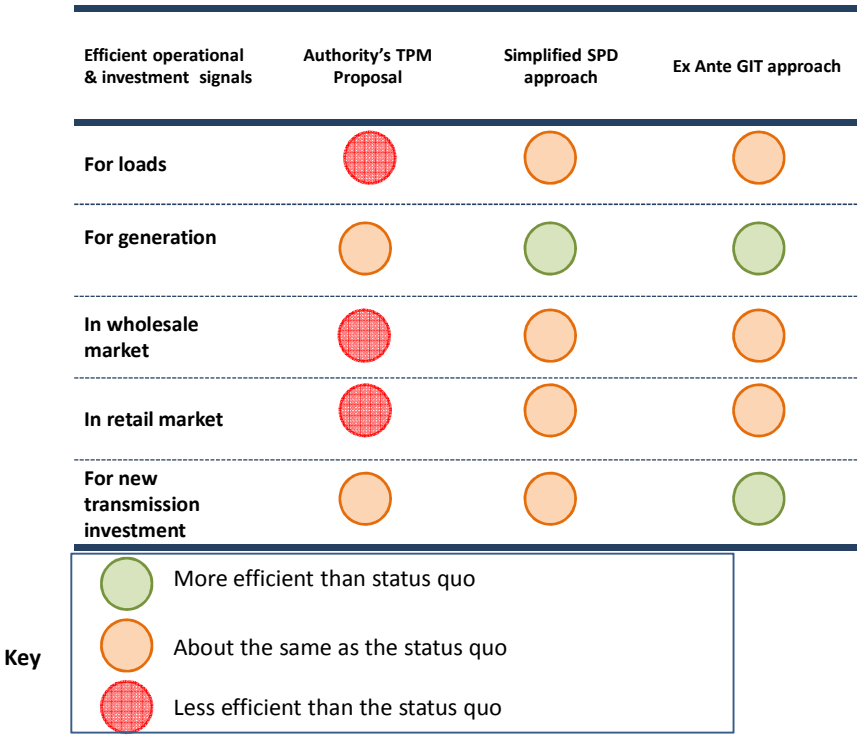
Based on the themes identified from submissions, we have developed two alternative beneficiary pays approaches to be applied to HVDC and significant new transmission investments. We detail these two approaches in Section 2. We characterise both of the alternative methods as "beneficiary pays" approaches, but are more evolutionary in nature and do not have the unintended consequences that detract from the efficiency of the Authority's more radical proposal. The key features of these alternative approaches are:

- **"Simplified SPD"** approach uses the same basic approach as the Authority, but uses a longer time period of SPD data and fixes charges for a longer period of time to provide more predictability and less volatility.
- **"Ex Ante GIT"** approach uses an analysis of benefits undertaken as part of the GIT process to link investment approval decisions to transmission charges.

The results of our initial assessment of the efficiency of these alternative options are summarised in Figure 1.1 with a detailed assessment in Section 3. Both of the alternative approaches evaluated in this report are expected to improve efficiency relative to the status quo—by removing the current inefficiency of HVDC charges, but without introducing new inefficiencies through complex and volatile transmission charges.

These alternatives are not necessarily mutually exclusive. The Authority could choose to incorporate elements of both into a single TPM, for example by setting HVDC charges based on a simplified SPD approach, and requiring an ex-ante GIT approach for future investments above a certain size. In combining these approaches, the Authority would need to ensure that the TPM does not become unhelpfully complex (a concern raised in relation to the proposed TPM).

Figure 1.1: Summary of Efficiency Impacts Compared to the Status Quo



This analysis indicates that there is merit in considering both of the alternative TPM approaches described in this report further, and subjecting these approaches to a full cost benefit analysis. Because these approaches draw on the submissions made on the Authority's proposed TPM, we would expect them to find much greater acceptance among stakeholders than the Authority's proposal.

2 Alternative Transmission Pricing Approaches

This section presents two alternative TPM approaches that build on the Authority's preference for a beneficiary pays approach, while only making incremental changes to the current TPM that show the promise of providing net benefits. These options also explicitly aim for substantially lower implementation costs and risks, and a lower probability of unintended consequences than the Authority's proposed TPM.

We propose two alternative TPM approaches for evaluation:

- A simplified SPD approach
- An ex-ante beneficiary pays approach using Grid Investment Test (GIT).

A key feature of both of these approaches is that they are more evolutionary and less radical than the proposed TPM. As a result, costs and risks are reduced, and the approaches have less prospect of introducing adverse unintended consequences.

In developing our alternate models, we assume that the treatment of connection charges and the use of the LCE to reduce overall transmission charges remain essentially unchanged from the current TPM. We have also ignored the kvar charge for the recovery of network reactive support services.

2.1 Key Themes from Submissions

Our review is that there are three key themes from the submissions:

- The radical nature and complexity of the proposed TPM is out of scale with the problem that it seeks to address
- Although beneficiary pays is an interesting and potentially valuable concept in pricing transmission, the way that the Authority proposes to implement the beneficiary pays is flawed increasing costs and risk to participants; and
- The Cost Benefit Analysis (CBA) provided by the Authority is superficial, and does not provide a compelling case for adopting the proposed TPM.

Our analysis suggests that a simpler TPM, with changes targeted at problems with the existing TPM, is likely to provide a better way forward than the Authority's more revolutionary proposal.

2.2 A Simplified SPD Approach

As highlighted above, many submitters like the concept of beneficiary pays, but are opposed to the complex way that the Authority proposes to implement that concept. To develop a more simple approach to estimating benefits (while retaining the use of SPD), we have tried to eliminate the features of the Authority's' proposed TPM that have the greatest potential to create inefficiencies and unintended consequences.

The key features of the simplified SPD are as follows:

- **Limiting the application of the SPD charge only to new large assets (with the exception of the HVDC)**—we suggest that an asset value of $20 million or greater should be considered ($20 million aligns with the Commerce Commission threshold for applying the GIT). This will substantially reduce the number of assets with costs allocated under SPD charge, making the required calculations less frequent and perhaps allowing more careful consideration of the assumptions used in the counterfactual. We have limited

the retrospective use of this model to the HVDC assets in order to resolve a legacy inefficiency in the current TPM

- **Using SPD data over a longer period of time**—we suggest using a five year trailing average to set charges that would be fixed for each asset for five years looking forward. The trailing average approach will eliminate (or at least substantially reduce) any incentive for generators to alter their infra- and supra-marginal offers to try to reduce or shift their charges allocated under SPD. This approach will also produce more stable and predictable charges, creating greater confidence to invest.
- **Calculating benefits on an uncapped half hourly basis**—this will give a better distribution of benefits that reflects the reality that many transmission assets only provide benefits during at certain periods—for example, during periods of peak demand. These benefits are nevertheless important, and should be counted to maintain the credibility of a beneficiary pays approach.
- **Allocating the Simplified SPD charge to loads to lines businesses, not retailers**—reducing costs and risks.
- **Allocating the residual to loads through the RCPD**—as per the current interconnection charge.

This Simplified SPD approach would use generator offer information to calculate benefits, and would therefore require careful consideration of medium and long term counterfactuals. In particular, we would expect this simplified SPD approach to pay closer attention to dealing with the cost of non-supply of energy when major transmission assets are removed from the SPD model to estimate benefits.

2.3 An Ex-ante GIT Approach

Our second alternative TPM approach is based on the beneficiary pays approach to transmission pricing emerging throughout the United States (initially in New York, and more recently by other RTOs complying with FERC Order 1000). Under this approach, benefits are estimated as part of the transmission investment decision process, and those benefits form the basis for allocating costs to different users of the network.

There are two key characteristics of this approach that we think can be incorporated into the New Zealand regime for approving transmission investment:

- **The costs allocated to users are known before the investment takes place.** The investment approval process needs to ensure that participants have a clear understanding of the expected benefits they will receive, and the costs they are being asked to bear to realise those benefits.
- **Once charges are set (in advance of investment), charges don't materially change—even if actual benefits are different than predicted.** This promotes a high degree of transparency and certainty for participants, and focuses attention at the only point in the process where outcomes can be impacted favourably—before the decision is made to invest.

Some ex-ante approaches to allocating costs to beneficiaries also provide decision rights to the parties that will bear the costs of the new transmission assets. This means that the parties that will pay for transmission (the identified beneficiaries) vote on whether they agree that the investment is in their interests, given the amount they will be required to pay. While decision rights provide valuable input to the decision-making process, in our view this not an essential design feature of a beneficiary pays approach. We consider that

the ex-ante allocation of anticipated costs itself enables more focused interaction on investment decisions because participants can see the benefits that an investment is expected to provide, and the impacts that the investment will have on their transmission charges.

We expect that this alternative would require changes to the current GIT process. In the GIT, projects proceed if they provide net market benefits—that is the benefits to the market as a whole outweigh the costs of the investment. Under this process, gross benefits are calculated at a market level and over the economic life of the asset. These benefits for a transmission project typically include:

- Reliability benefits—that is the transmission system becomes more reliable with more elements through greater redundancy. This benefit is generally applicable to all participants on the network
- Unserved energy—that is the transmission system has a greater capacity to meet demand peaks. This benefit usually accrues to loads in the area served by the upgrade; and
- Access to lower cost generation—that is the transmission system allows lower cost generation access to the market, for example the HVDC link allows South Island generation to be exported to North Island customers. This benefit could be specific to a group of generators or more diverse.

Our alternative TPM approach would go further than simply identifying the overall magnitude of these benefits, and would involve broadly estimating the groups that will capture these benefits. For major projects (such as Pole 3) these groups could be very broad: such as North Island generators, North Island loads, South Island generators and South Island loads. For other projects, the groups of beneficiaries might be much smaller and narrower—for example, allowing a certain group of generators better access to the market or preventing unserved energy for loads in a certain region. We suspect that all participants would benefit to some extent from the increased reliability that comes with new transmission projects.

The next step in this analytical process would be to allocate the costs of the project to these groups in proportion to the benefits each group is expected to receive. Rather than a retrospective and varying SPD allocation, this approach would involve a one-off allocation that is used to recover the costs over the economic life of the asset. The final step would involve calculating the change in transmission charges that this allocation creates.

From this analysis it will become clear whether the costs should be allocated in a widespread way (involving a small increase generally across all groups of participants), or whether the costs should involve a material increase to a specific group or groups of participants. In our view, unless it can be shown that the distribution of benefits is highly skewed (so as to call for a material increase in transmission charges for a certain group of participants), then the costs of the project should be shared by all participants through the interconnection charge (RCPD). This is because if the project is small scale and/or the benefits are widely dispersed, then there is little reason to suggest that efficiency will be enhanced by a more specific allocation of costs to identified beneficiaries.

If the analysis finds that the distribution of benefits is skewed towards a particular group of transmission users, then we suggest allocating:

- Load charges by RCPD by RCPD area—in other words, customers in a particular RCPD area that benefit disproportionately from a transmission

investment would pay a higher RCPD charge than those customers in adjacent areas that receive materially less benefit; and

- Generation charges by MWh by RCPD area—in other words, some generators that benefit disproportionately from the investment would pay additional charges based on their output, while other generators that did not benefit materially would pay no such charges. The selection of an MWh charge for generation is because this is the least distortionary approach.

In summary, our "Ex ante GIT Approach" consists of:

- Enhancing the GIT process for projects over $100 million to include the disaggregation of expected benefits to broad groups of participants
- Modelling the impact of allocating expected costs to identified groups on the basis of the benefits they receive
- Determining if the modelled allocation of costs is materially and significantly different to incorporating the costs into the RCPD interconnection charge; and
- If the identification of beneficiaries leads to materially different charges, determining fixed ex-ante pricing differentials using RCPD (for loads) and MWh (for generation).

Ideally, this approach would only be applied prospectively—for future projects that have not yet passed through the GIT. However, given the general view that the current HVDC allocation is an important source of inefficiency in the current TPM, we suggest that the approach could also be applied retrospectively to HVDC assets (Pole 2 and Pole 3). This is not ideal, but might be a pragmatic way to resolve the long-standing legacy issue of HVDC pricing.

Given the extensive and detailed approval process under the GIT, it should be possible to allocate the benefits identified at the time of approval according to broad participant groups. This means that the gross benefits of Pole 3 identified as part of the GIT process would be allocated to groups of beneficiaries. This would not be possible for Pole 2 (which was approved long before the GIT process). However, it still should be possible to retrospectively calculate how benefits are shared amongst different users of the transmission network (for example, by using or building on previous analysis of the direction of flows across the HVDC link).

3 Evaluating of Alternative TPM Approaches

This section evaluates two possible TPM approaches against the current TPM. The two approaches are:

- The "Simplified SPD" approach described in Section 2.2
- The "Ex Ante GIT" approach described in Section 2.3.

As a comparison, we also include an evaluation of the Authority's Proposed TPM.

We use the evaluation framework presented in our first report and conclude that both the Simplified SPD approach and the Ex ante GIT approach would perform significantly better in a CBA than the status quo.

3.1 Providing Efficient Operational, Investment, and Locational Signals for Load

A TPM should ensure that customers consume efficiently with no deadweight losses, that they efficiently invest in new equipment, and that the investment is located such that the overall cost of supply (transmission and generation) is broadly co-optimised.

Simplified SPD approach

Under the simplified SPD approach, there is a risk that allocating sunk transmission costs by differential charges to loads may create inefficiencies. As with the Authority's TPM proposal, there is little known of the relationship between the benefits that are allocated by the SPD method and users' sensitivity to price. This means that the allocation of sunk transmission costs may increase, decrease, or leave unchanged users' consumption, depending on their sensitivity to price. Efficiency could therefore correspondingly be enhanced, reduced, or remain unchanged. In regard to locational signals, as strong locational signals already exist through nodal energy prices, it is unlikely that any small additional signalling of locational differences would enhance efficiency.

An important difference between the Authority's proposed TPM and the simplified SPD approach is that the latter limits the application of the SPD charge to major projects (with a value of greater than $20 million). This reduces the scale of any inefficiency that is introduced. The simplified SPD approach also involves charges that are much more stable and predictable because prices are calculated in advance, and would remain fixed for a period of five years.

Overall, the simplified SPD approach is likely to be slightly less efficient for loads than the status quo because the beneficiary pays price signal is unlikely to enhance efficiency, but the charges will at least be stable and predictable—giving loads more confidence to invest.

Ex-ante GIT approach

Under the ex-ante GIT approach, charges are allocated to load at the time of the investment approval through the GIT process, thus this process provides opportunities for loads to participate, and to influence whether proposed investments are approved. This participation would help to offset the uncertainty of allocating charges without knowing how price sensitive loads are to changing transmission prices. Restricting the allocation to only large transmission investments that have a skewed distribution of benefits also helps to mitigate the risk of introducing inefficiency.

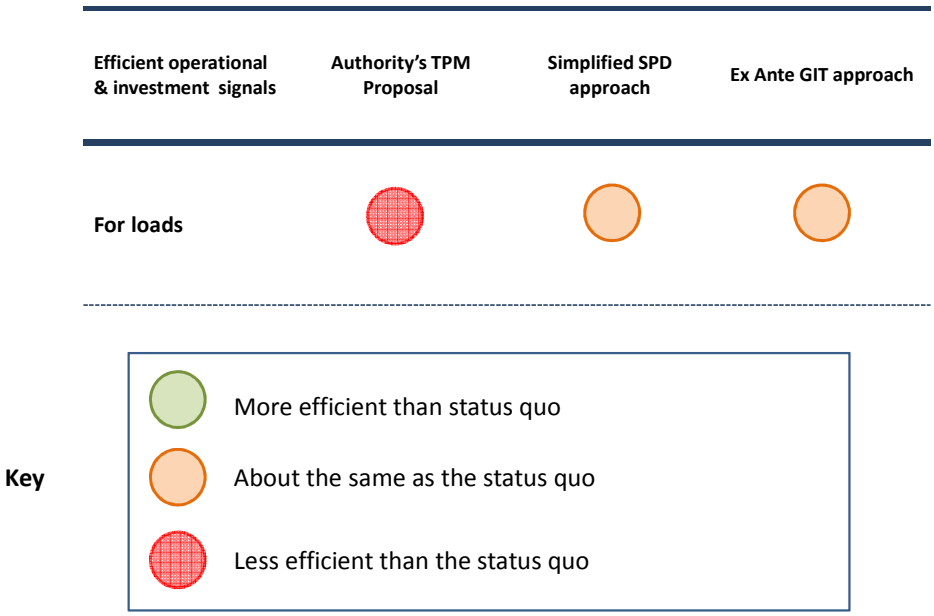
The ex-ante GIT approach would generate stable and predictable prices because they are calculated in advance of an investment decision, and are fixed for the economic life of the asset.

Overall, the ex-ante GIT approach is likely to have efficiency impacts that are similar to the status quo because charges are stable and predictable, and the approach will only be applied to projects where it is likely to be warranted (large transmission investments that have a skewed distribution of benefits).

Summary of efficient signals for load

Our analysis of the two approaches against the status quo in providing efficient operational, investment, and locational signals for loads are summarised in Figure 3.1. We assess the Authority's Proposed TPM as being less efficient than the status quo largely as a result of its volatility and unpredictability.

Figure 3.1: Efficiency Impacts for Loads Compared with the Status Quo



3.2 Providing Efficient Operational, Investment, and Locational Signals for Generation

If transmission charges are levied on generation, the TPM should aim to ensure that generators maximise their offers of capacity to the market, that new generation investment is efficient, and that the investment is located optimally to minimise the overall cost of transmission and generation.

Simplified SPD approach

The simplified SPD approach uses SPD data that is collected over a long period of time. This substantially reduces (and potentially eliminates) any incentive for generators to attempt to reduce their liability for transmission charges by distorting their infra-marginal and supra-marginal offers. This is because the risks of strategic bidding (such as not being dispatched despite having short run costs below the clearing price), would outweigh the benefits of changing offers. The success of any strategic bidding also would not be apparent for many years (as opposed to being realised on a monthly basis under the Authority's Proposed TPM).

This suggests that overall the simplified SPD approach will be materially more efficient than the status quo. It will eliminate the inefficiency resulting from the allocation of all HVDC costs to South Island generators via the HAMI, without adverse consequences for least cost generation dispatch.

Ex-ante GIT approach

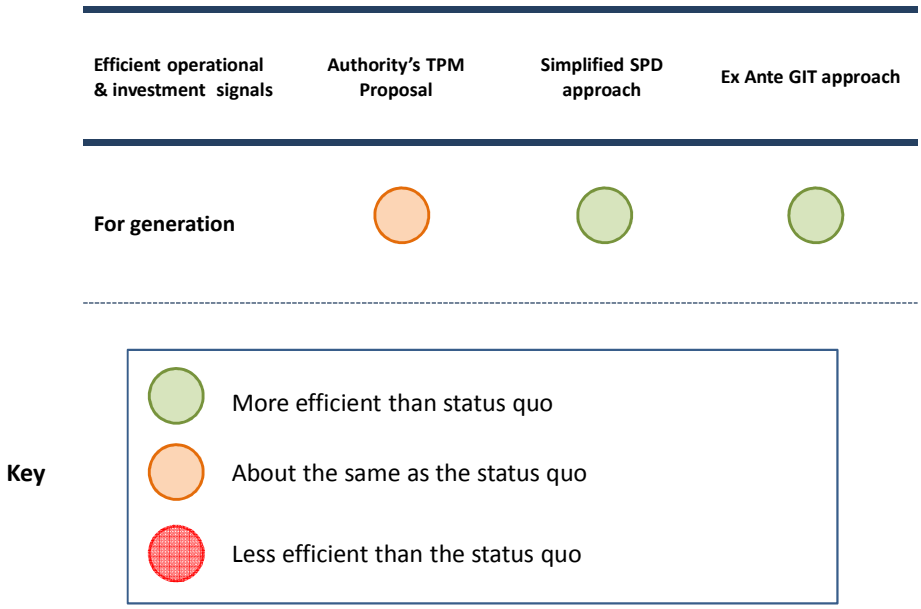
Since this approach does not use SPD offer data, there is no incentive for generators to distort their offers to reduce their liability for transmission charges.

This suggests that overall the ex-ante GIT approach will be materially more efficient than the status quo as it will eliminate the inefficiency resulting from the allocation of all HVDC costs to South Island generators via the HAMI.

Summary of signals for generation

Our analysis of the two approaches against the status quo in providing efficient operational, investment, and locational signals for generation is summarised in Figure 3.2. We assess the Authority's Proposed TPM as being about the same efficiency as the status quo, as while it eliminates one source of inefficiency (HAMI allocation to SI generators) it creates another of similar magnitude (the distortion of generator offers).

Figure 3.2: Efficiency Impacts for Generation Compared with the Status Quo



3.3 Supporting Efficiency in Wholesale Market

The TPM should support the incentive for generators to offer at marginal cost to ensure least cost dispatch, and should also support efficient risk management through associated hedge markets.

Simplified SPD approach

In the simplified SPD approach, charges to generators would all be levied on a MWh basis, with no RCPI allocation of residual transmission costs. As a result, the ability for generators to pass-through charges to loads would involve less uncertainty and risk than under an RCPI approach. More stable charges would also reduce the risk on generators in managing volatility.

For these reasons, the simplified SPD approach is likely to have similar impacts on the efficiency of the wholesale market as the status quo.

Ex-ante GIT approach

The ex-ante GIT approach also involves charges to generators that are all set on a MWh basis, with no RCPI allocation of residual costs. Just as with the simplified SPD

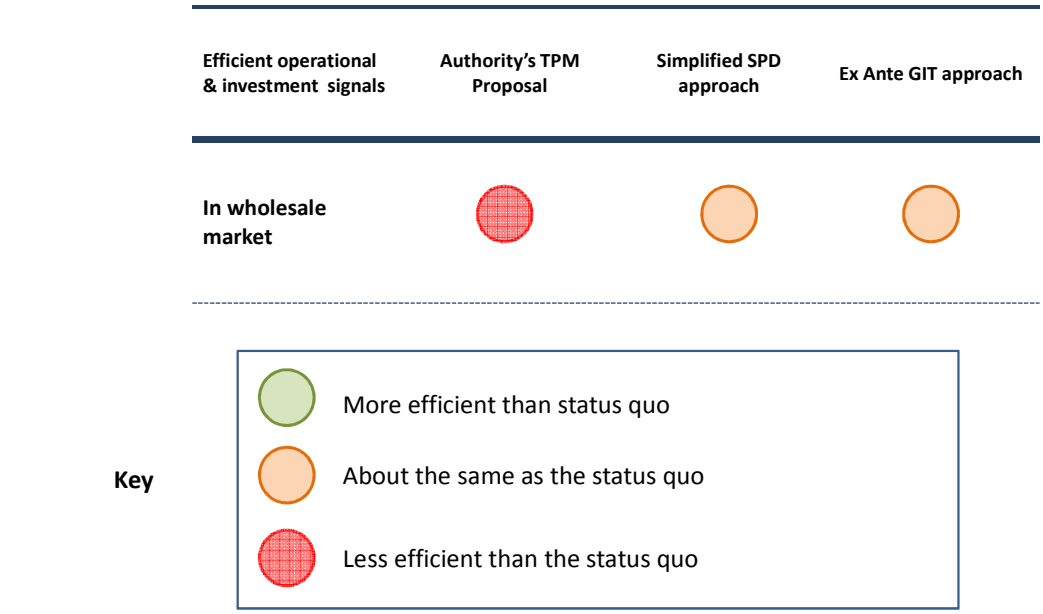
approach, this creates greater stability of prices and greater confidence on how the costs flow through to the wholesale market.

For these reasons, the ex-ante GIT approach is likely to have similar impacts on the efficiency of the wholesale market as the status quo.

Summary of wholesale market efficiency

Our analysis of the two approaches against the status quo in contributing to wholesale market efficiency is summarised in Figure 3.3. We assess the Authority's Proposed TPM as being less efficient that the status quo as a result of the volatile spot prices at times of peak demand and the impact on generators incentives to offer capacity that arise from the use of RCPI.

Figure 3.3: Wholesale Market Efficiency Impacts Compared with the Status Quo



3.4 Supporting Efficiency in the Retail Market

If charges are levied on retailers, the TPM should aim to promote competition and new entry in the retail market by ensuring that charges do not impose inefficient costs and risks on retail market participants.

Simplified SPD approach

The simplified SPD approach levies all costs allocated to load on distribution companies, so has the same effect as current interconnection charges. For this reason, the efficiency of the simplified SPD approach will be identical to the status quo in its impact on the retail market.

Ex-ante GIT approach

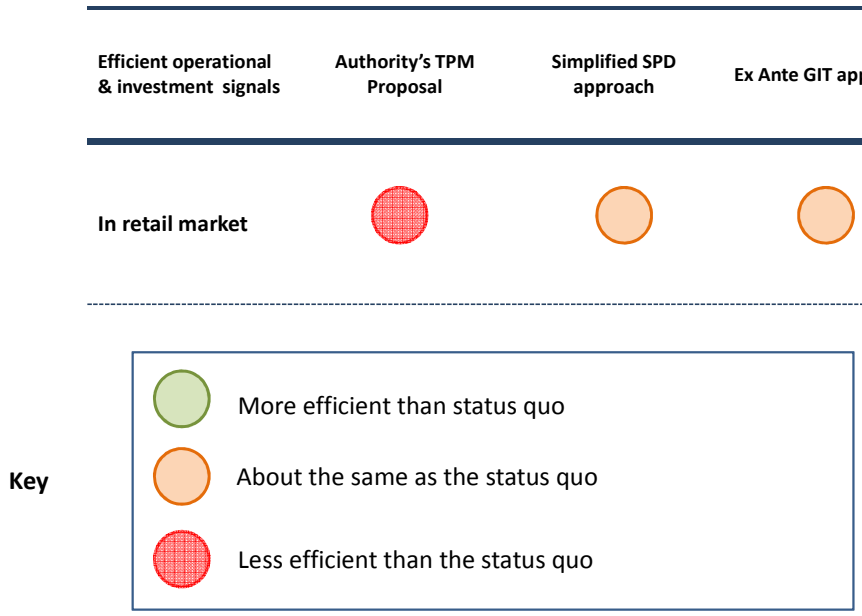
The ex-ante approach levies all costs allocated to load on distribution companies, so has the same effect as current interconnection charges. For this reason, the efficiency of the ex-ante GIT approach will be identical to the status quo in its impact on the retail market.

Summary of retail market efficiency

Our analysis of the two approaches against the status quo in contributing to retail market efficiency is summarised in in Figure 3.4. We assess the efficiency of the Authority's

Proposed TPM as being less than the status quo as a result of the allocation of volatile charges to retailers that aren't best placed to manage them.

Figure 3.4: Retail Market Efficiency Impacts Compared with the Status Quo



3.5 Providing Efficient Signals for New Transmission Investment

If a TPM is related to the transmission investment approval process or influences new investment decisions, then this should help to ensure that transmission investment is properly dimensioned, timed, and located.

Simplified SPD approach

In the simplified SPD approach there is no interaction between the setting of transmission charges using SPD and approving investments under the GIT. As a result, this approach has the same effects on efficiency as the status quo.

Ex-ante GIT approach

A key feature of the ex-ante GIT approach is the direct interaction between transmission charges and the investment decision. This is because transmission charges for major investments will be based on disaggregating the gross benefits estimated in the GIT, and allocating costs to different groups of participants based on those disaggregated benefits. If the distribution of benefits is significantly skewed away from a "normal" RCPD allocation to load, then future transmission charges are set—as part of the GIT process—to recover the costs from those groups of participants that benefit.

This direct relationship between the GIT process and transmission charges should lead to materially better investment decisions because participants would have certainty about the impact of investments on their transmission charges. We would expect that if benefits are skewed away from a general distribution across all transmission users, then impacted participants will have strong incentives to make sure the regulator approving investments has the best information on its impacts. In fact:

- Those participants that significantly benefit would be incentivised to question the magnitude of their benefits and the justification for the investment; and

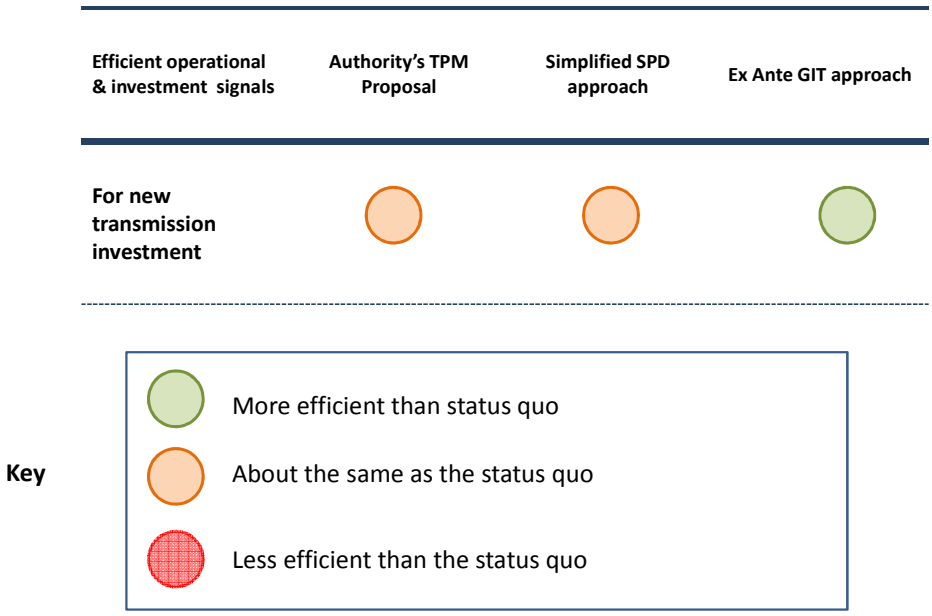
- Those groups that do not benefit significantly would be incentivised to support the magnitude of costs allocated to other participants, even though they may be indifferent to whether or not the investment proceeds.

For this reason, we suggest that the ex-ante GIT approach would improve the efficiency of transmission investment decisions over the status quo.

Summary of efficiency of transmission investment

We have summarised our analysis of the two models against the status quo in providing efficient signals for new transmission investment in Figure 3.5. We assess the efficiency of the Authority's Proposed TPM as being the same as the status quo as a result of the lack of linkages between transmission charges and investment decisions.

Figure 3.5: Efficient Signals for New Transmission Investment



T: +1 (202) 466-6790
F: +1 (202) 466-6797
1747 Pennsylvania Avenue
NW, 12th Floor
WASHINGTON DC 20006
United States of America

T: +61 (2) 9231 6862
F: +61 (2) 9231 3847
36 – 38 Young Street
SYDNEY NSW 2000
Australia

T: +64 (4) 913 2800
F: +64 (4) 913 2808
Level 2, 88 The Terrace
PO Box 10-225
WELLINGTON 6143
New Zealand

T: +33 (1) 45 27 24 55
F: +33 (1) 45 20 17 69
7 Rue Claude Chahu
PARIS 75116
France

---------- www.castalia-advisors.com