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24th June 2014

Dr John Rampton
General Manager Market Design
Electricity Authority

By email to submissions@ea.govt.nz

Dear John,

Transmission pricing methodology review: Conmnection Charges Working paper

This is a submission by Carter Holt Harvey Pulp & Paper Ltd on the Electricity Authority (EA) Working paper "Transmission Pricing Methodology review : Connection charges" published 13 May 2014.

1. **High level summary response**
    a. While it is quite appropriate to consider whether improvements could be made in allocation of costs involved with connection assets as part of the TPM review, we consider that it also would have been appropriate to carry out at least a "back of envelope "order of magnitude estimate of possible benefits that could be obtained from improvements prior to any decision to develop any working paper on this subject. The necessarily limited resources involved in developing submissions in response to this paper and no doubt the development of the paper itself are not insignficant, and we consider that their deployment on this issue should have a firmer basis of justification than is evident to us in this working paper.
    b. It sems to us that the question of efficiency in investments in connection assets is primarily dealt with via the Commerce Commission IPP process, and the connection asset cost allocation methodology in the TPM should support or at least not hinder the effectiveness of that process. Any evaluation of possible changes in cost allocation for connection assets should include this aspect as a significant consideration.
    c. There is insufficient data in the working paper to enable us to arrive at a view as to whether there may be material efficiency improvements that could be made to the existing methodology, and we
    d. **recommend** that the Authority gathers sufficient data to enable a careful review of the the materiality of any possible efficiency improvements before

deciding whether or not to even proceed further with a cost benefit analysis paper.

e. Below are some comments on the three possible areas of net benefit identified in the paper

2. ***"Whether there is potential for connection assets to be inefficiently classified as interconnection assets?"***

   a. The comments made by Transpower in answer to question 1 of MEUG's list of recently submitted questions (attached) appear to indicate that there has not to date been any connection assets inefficiently classified as inter-connection assets.

   b. Nevertheless, there may well be some benefit in clarifying this potential boundary issue.

3. ***"Whether the asset component of the connection charge, which is based on applying average depreciation to all connection pool assets, is inefficient?"***

   a. Connection assets in our view deliver a service to the consumer rather than a collection of equipment, and it seems appropriate to us that charges to the consumer should be related primarily to service.

   b. We note the answer to question 3 of MEUG's list of questions (attached) appears to be at odds with the comment in para 1.19(a) of the working paper that "asset service levels vary considerably over an asset's life" and challenges the implied assumptions in Para 1.19(c).

   c. We have given some thought to the possible impact DRC charges may have on investments , operation and maintenance of connection assets and have drawn from our own experience in operating and maintaining high capital value , long life assets to offer the following comments:

      i. The fleet management strategy employed by Transpower is very similar in concept to that which we use for our own plant and equipment and enjoys a significant overall efficiency advantage over viewing plant and equipment on an individual basis.

      ii. The replacement or upgrading of plant inevitably causes disruption and operating losses (the beginning of the "bathtub" curve) and is a powerful incentive to maintain the status quo with existing equipment.

      iii. It is usually a matter of experienced judgement (along with data analysis of operating performance and maintenance costs) as to when to replace plant and equipment, as by the time it has become clear that the plant should be replaced (ie the plant is moving up the other end of the "bathtub " curve") , it is too late as the operating losses caused by reliability reduction will far outweigh any financial advantage due to delaying capital expenditure.

      iv. Our experience to date with the proposed replacement of the Kinleith substation indicates to us that as a customer (albeit via the lines company) we have had sufficient opportunity to comment on and contribute in a positive way to the proposal.

      v. We are sceptical of the Authority's view in para 7.46 that ARC-based charges are not required in order to maintain a fleet approach and consider that more analysis than appears to been done so far is necessary before any such conclusion could be arrived at.

d. The answers to date to questions 2,3, 4 ,5 9 and 10 posed by MEUG provide some enhanced understanding as to how effective the current connection asset investment and cost allocation policies area.

e. Further investigations to complete the answers to these (and probably other) questions would enhance understanding further to the point where more definitive conclusions as to whether the current allocation methodology supports efficient investment in connection assets and what opportunities there may be to improve the efficiency in investment via asset allocation methodology changes and their likely materiality .

f. We **recommend** that a detailed analysis of the present connection assets, their age, performance , benchmarking of current asset replacement expenditure as a percentage of asset value against international benchmarks etc is carried out prior to any decision as to whether to develop a CBA for any proposed changes as to how the asset component of connection charges are allocated.

4. ***"Whether the connection pool cost allocation methodology, for the recovery of maintenance, operating and overhead costs, is inefficient?"***

   a. Our experience in efficiently maintaining high capital value plant tells us that allocating maintenance costs to the equipment that incurs the cost is an important aspect of ensuring that the required balance between plant reliability and maintenance costs is optimised.

   b. It follows therefore that there may indeed be some cost efficiencies in incentivising Transpower to allocate costs as much as realisticaly possible.

Thank you for the opportunity to contribute to this working paper on connection asset charges.

Yours sincerely

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Appendix : Transpower response to MEUG questions

Cover note

On 5 June the Authority requested that Transpower answer several questions to assist submitters in responding to the Authority's connection charges working paper. The questions were submitted by the Major Electricity Users Group to the Authority.

We have answered the questions fully wherever possible. Where we do not hold the information or do not hold it in the form requested[1] we have provided information that we do have in accessible form that may partially address the question. We have also provide links to public documents that we consider may help address the specific question or to provide further context. Responses are in blue.

[1] For some questions we do not hold the information in the form requested and producing it in that form involves significant analysis. The people who could do this analysis (our asset accounting and pricing teams) are currently fully committed with year-end and the TPM pricing round. We have considered whether alternative internal or contract resources could carry out this work on instruction from asset accounting and pricing experts. We concluded that this is unrealistic in the timeframes available and would increase risk of error in key asset accounting and pricing processes.

4th June 2014

MEUG questions on EA TPM connection charges working paper dated May 2014

1. Please provide examples in the past ten years where loop configurations have been applied when changes or additions to connection or interconnection assets have been made.

There are no examples that we are aware of over the last ten years where loop configurations have been applied that have resulted in re-classification of assets from connection to interconnection.

However, the NAaN project caused certain interconnection assets to be temporarily classified as connection assets. The NAaN assets were reclassified from connection (during the phased implementation of the NAaN) to interconnection after a loop configuration was completed. The ALB_WRD cable changed from connection to interconnection after the circuit from Albany to Penrose (via Wairau Road and Hobson Street) was completed.

Transpower submitted a Code exemption request[2] to the Authority to avoid what we considered to be an unintentional product of the TPM's drafting. The Authority did not grant the exemption[3] and, as a consequence, approximately $3m in charges have been allocated to Vector as connection charges that otherwise would have been allocated to the interconnection pool.

Although Vector and Transpower agreed that it was not appropriate for these assets to be classified as connection assets during the phased introduction of the NAaN project, Vector did not agree that the current TPM required any of the assets to be temporarily allocated to Vector as connection assets. Vector has started proceedings under the Declaratory Judgements Act about Transpower's decision to treat NAaN cables as a connection asset while they were partly commissioned.

2. Please provide the following information on the Transpower connection asset base.

    a. Value of total connection asset base for each year over the past twenty years.

This specific information is not held in a readily accessible form and requires significant manipulation of data to produce. We can provide at least some of this information but unfortunately we do not have resources available on short notice to perform this analysis within the current consultation timeframes.

    b. Average age of the total connection asset base each year over the past twenty years.

This specific information is not held in a readily accessible form and requires significant manipulation of data to produce. Unfortunately we do not have resources available on short notice to perform this analysis within the current consultation timeframes.

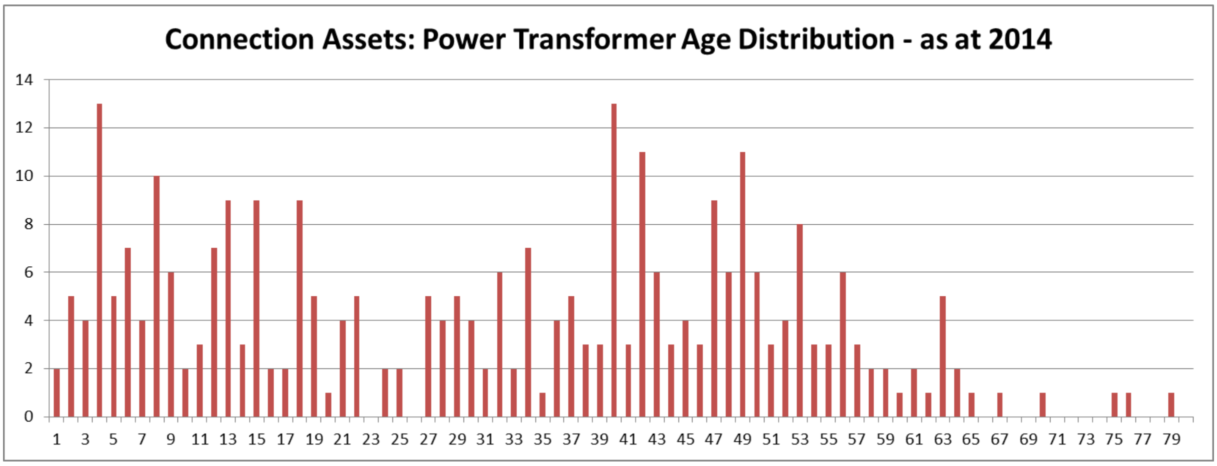
However, we have analysed asset ages for our fleet of connection transformers (as the single largest value connection asset). The chart and table below provide transformer ages as of 2014. This shows that in 2014:

- the average age of connection transformers is 31.4 years (the accounting life of these assets is 50 years) and the oldest is 79 years old

[2] [insert reference]

[3] Electricity Authority, Exemption application from Transpower New Zealand Limited for considering connection assets as interconnection assets for transmission pricing, final decision, 29 October 2013.

- 42% of connection transformers are more than 80% depreciated and 18% are fully depreciated (i.e. have exceeded their expected economic life)



Connection Transformer age spread

	<normal economic life					> normal economic life		
Age (years)	0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79
Transformer count	56	51	28	37	69	40	13	4
% of total	18.8%	17.1%	9.4%	12.4%	23.2%	13.4%	4.4%	1.3%

Extensive information on Transpower's asset management policies and strategies are published on our website including asset health information (which contains asset age information for some of our assets fleets). Please see: https://www.transpower.co.nz/about-us/industry-information/asset-management-framework and RT02 and https://www.transpower.co.nz/about-us/industry-information/rcp2-submission-and-itp/rcp2-regulatory-templates

c. Average age at replacement of assets replaced over the past twenty years along with a comparison with their depreciation life.

This specific information is not held in a readily accessible form and requires significant manipulation of data to produce. Unfortunately we do not have resources available on short notice to perform this analysis within the current consultation timeframes.

d. % of assets still in service older than their depreciation life.

This specific information is not held in a readily accessible form and requires significant manipulation of data to produce. Unfortunately we do not have resources available on short notice to perform this analysis within the current consultation timeframes.

However, for our own submission on this subject we have analysed asset ages for our fleet of connection transformers (as the single largest value connection asset) and have established that 18% of connection transformers are fully depreciated (further detail is provided in the table above).

The table below summarises asset replacement drivers and the action we take under each.

Driver	Action
Individual condition or failure	• If a specific connection asset (supply) power transformer suffers a major failure, or proves to be in a particularly high risk condition, we prepare a business case for replacement. This would typically be relatively short notice, and might require substitution within an existing capital plan • For the case of sudden major failure, it would normally be expected that we would mobilise one of our strategic spare power transformers, so as to be able to restore security within, say, 4 weeks. A replacement transformer will typically then be ordered within 12 months, to either replace the original failed transformer (thereby releasing the strategic spare -which may be over-capacity for the application), or alternatively to provide a new strategic spare, leaving the first spare unit in its new service position.
Fleet Asset Health	• Analysis of overall fleet performance and risk leads to a long term strategy to manage service risk and meet overall performance expectations by maintaining overall asset health over the longer term, mostly through planned replacements. The overall long term replacement programme is supported by economic analysis. • A medium-long term programme is prepared, and the capital funding required is set out in expenditure proposals under the IPP regulation. • We then plan and undertake the replacement of target power transformers in an orderly manner, but substitutions can occur within the programme, and between programmes • Asset health of the fleet is trended over time, so that we can compare the actual asset health profile with that forecast at the commencement of the regulatory period. • Replacement transformers installed as part of this long term programme may differ from the originals, but will generally be "modern equivalent".
Capacity	• If the capacity increase is necessary to fulfil Transpower's obligation to meet the GRS (refer Schedule 12.2) following the Grid Reliability Report process (refer Benchmark Agreement clause 40) then the investment cost is recovered via the TPM. • If a customer seeks an increase in firm capacity (where the rating of the connection transformer is the existing limit) above the GRS, then typically Transpower prepares an offer to replace the existing transformer(s), funded via a specific investment contract. The investment contract route requires our Customers to consult on possible price implications if reliability is above GRS (refer 12.35). •

3. Data that the EA may have on the variation of actual service levels of connection assets compared with their age.

The design of most customers' connections provides N-1 security at the point of service. This means service performance (at the point of service) is usually a function of the availability / reliability of two circuits. Total interruption is likely to be caused by an event impacting one critical asset while the customer is reduced to N security (e.g. for maintenance). The relationship between asset age and service performance is therefore not strong, complex and inter-related with many other factors. Analysis of performance history shows the stochastic nature and influence of many factors.

The performance of individual assets can generally be expected to degrade over time although the degree of degradation and the timeframe over which this occurs will vary greatly between asset types. For example, communications assets will degrade differently to buildings and ground works which will degrade differently to transformers, switch gear, circuit breakers, transmission towers and conductor…etc. As a rule the performance of individual assets is more likely to follow the 'bathtub' curve (teething issues followed by a long period without problems and increasing problems near end of life) than be linear.

However, the key point is that the N-1 security provided in the design of supply to most connection points of service means that there is no direct and immediate link between asset age and delivered service.

4. Please provide examples and values of stranded connection assets that have become evident over the past twenty years.

We don't have any specific examples of connection asset stranding due to inaccurate or false customer need case (i.e. where the customer has withheld or misrepresented information to Transpower).

5. Please provide the percentage of connection assets by value that have connected parties that are Commerce Commission-regulated distributors and are able to pass on any connection charges.

Electricity distribution businesses (in aggregate) account for approximately 76% of the book value of connection assets.

6. Results of the modelling work referred to on page 25 of the consultation paper.

7. Why not use accelerating depreciation rates over time to better reflect actual physical depreciation? ie to reflect that new assets initially physically depreciate little but at end of economic life depreciate rapidly

Transpower's depreciation rates are set by the Commerce Commission (not the Authority).

For information disclosure and price setting purposes, the Commerce Commission adopts a straight line depreciation method, using physical asset lives.

Details of the depreciation rules can be found at Commerce Commission, Input Methodologies (Transpower) Reasons Paper, December 2010, and Transpower Input Methodologies Determination [2012] NZCC 17, 29 June 2012.

8. How are asset, maintenance and operating charges set in CIC's?

In contrast to TPM connection charges, CIC charges allocate the costs of specific assets covered by a CIC to the contract counterparty.

Asset charges in relation to assets provided by Transpower under a CIC are determined on a cost recovery basis such that Transpower recovers, on a net of tax basis, the whole cost of the plant including financing costs. Maintenance and operating charges are determined in accordance with the TPM.

We use CICs predominantly for new connections or material expansion (in excess of what is required to maintain GRS) of existing services, and customers thus see the cost of providing that additional service. CIC charges provide flexibility for customers to negotiate the charging profile, including the duration of the contract and the balance between annualised and lump-sum components. CICs have a default charge profile that is flat in nominal terms i.e. declining in real terms.

[Questions from MEUG that the EA did not ask us to comment on]

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9. The like-for-like issue is described as one customer having newer assets over time than a second customer, but both customers paying an averaged fleet charge though the first customer presumably gets better service because on average the assets are newer. Is this true and does it matter? For example if the second customer is over time, even with very old assets, getting superior quality of supply (ie less interruptions) compared to the first customer where the Transpower connection assets fail repeatedly then presumably Transpower will be paying compensation to that connected party for unplanned connection service disruptions. Hence it's Transpower's call to replace those poorly performing assets. If we had a DRC approach then the second customer, even though it's not any of their fault the connection assets Transpower installed fail, would have to pay higher charges than the first customer for like-for-like connection services.

Refer also to the response to question 3.

There is not a strong or linear correlation between asset age and its performance (although for many assets reliability may be lower at the very beginning and very end of its life i.e. the 'bathtub' effect). In other words a customer with a 10% depreciated asset will not necessarily to receive a higher level of service than a customer with, say, a 90% depreciated asset.

We note that, although the working paper talks about depreciated replacement cost (DRC) our revenues under Commerce Commission regulations are actually based on depreciated *historic* cost, (DHC). The allocation of connection asset cost to connection customers is *currently* done on the basis of RC (although the TPM produces smoothed prices rather than the 'saw-tooth' price envisaged by the CCWP).

10. In the pros and cons of changing from ARC to DRC should the costs of designing and implementing a suitable transition be added as a cost? It would be inequitable and undermine confidence in the regulatory regime by parties that pay connection charges if, for example, a connected party had just entered into a connection agreement for new assets on expectation future charges would be at ARC only to find a change in the regulatory regime hoisted initial charges up to DRC. There is no point in giving such a customer any DRC level price signals because the decision has already been made. Hence a transition needs to be considered and implemented. This will take time and resources and hence isn't this a cost to be considered in the option of changing to DRC?

A transition from ARC to DRC could be necessary to avoid the change in depreciation method creating cross-subsidies.

It should be noted that ARC < DRC early in the asset's life and then ARC > DRC for the remainder of the asset's life. The cconnection charge needs to equal ARC (or DRC) for the entire life of the asset to recoup the asset cost. If ARC is charged for part of the life then DRC for the remainder the NPV of charges could be less than the asset cost.

11. Paragraph 1.19(b) suggests a benefit of changing from ARC to DRC is lower credit risk and lower stranding risk. The lower stranding risk issue is also discussed in paragraph 1.19(f), ie customers will have a higher incentive to disclose stranding risks. Is the stranding risk issue in paragraph 1.19(f) the same as that in paragraph 1.19(b)?

The risk faced by Transpower is determined by the depreciation method applied by the Commerce Commission for revenue setting purposes, not the depreciation method used for allocation purposes under the TPM. It is common practice for regulators to set an accelerated depreciation method for revenue setting purposes to reduce the risk of asset stranding etc.

Changing from ARC to DRC does not affect Transpower's credit risk. To the extent that customers opt for investment contracts, for example so they can obtain smoothed prices, Transpower's credit risk may be increased. No credit risk differential is recognised between TPM charges and investment contracts (i.e. the WACC is the same) at present. We have been considering whether this is appropriate and expect that it may be necessary to recognise the increased credit risk of investment contracts, possibly through a higher WACC.

12. There is some uncertainty about the lower credit risk argument in paragraph 1.19(b). Setting aside the stranding risk issue discussed in question 11 above, then how is any residual credit risk influenced by whether ARC or DRC is applied? Transpower will use all contractual options to recover charges if parties fail to pay their invoices whether ARC or DRC is used and in the end if Transpower cannot through the courts recover costs then doesn't the shortfall gets socialised across all customers because Transpower always gets its MAR?

Changing from ARC to DRC does not affect Transpower's credit risk. See question 11.

13. Is the argument in paragraph 1.19 (c) about inefficient allocative cross-subsidisation between customers supplied by different aged assets but paying equivalent charges the same as paragraph 1.19 (g) that discusses how an asset may be fully depreciated but under ARC a customer still pays as part of the bundled pool charge a deprecation component? If different, please explain.

We think the CCWP overstates the problem. While it is difficult to prove, mathematically, that each customer will pay the *exact* economic cost of the assets that serves them we have considered the issue and not been able to identify any systematic cross-subsidy between customers or asset categories.

A beneficial effect of averaging within the current TPM is that it has the effect of smoothing charges over time without incurring a finance charge to do so. This approach to pricing for network services is common. We have not attempted to do so but our expectation is that the cost of deferred cashflows associated with replicating smoothed price profiles under the alternative TPM would be non-trivial.

Depreciation rates are set to reflect the expected economic lives of different asset types. It is axiomatic that some assets last longer than expected and some will not live as long. This is a form of insurance that permits Transpower, and most other firms, to avoid exposing customers to random price shocks due to events beyond their control. We have not attempted to estimate the cost of this insurance through financial instruments.